

BOOK31R

Notes:

"H.F.I.R. #4" on spine

Blank pages: inside front covers, 1, 167, 168, inside back covers

- pages 37/38 has paperclip at top of page
- small piece of paper between pages 42 and 43
- 2 small pieces of paper between pages 118 and 119
- 1 small piece of paper stapled to page 128

Scanned by:

Sheila Finch

RSICC /Oak Ridge National Lab.

August 6, 1999



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.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 x 10 ⁻¹²	Meter ✓	2"	✓	3 x 10 ⁻¹²
"	"	"	"	✓	"
K-2	"	Meter ✓	1"	✓	"
"	"	Fast ✓	"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	✓	500V
PM-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.

Instruments and safeties checked out: AKM

Source in checked: AKM M-83

Emergency: F.D.C.

Instruments: M-1-2 PM-1-2

Red light: AKM 0.825

Start-up time by F.D.C. AKM Date 2-17-69

H.F.I.R.
Cores # 66-0 & 66-1
2 Combs, Top & Bottom.

Have spent fuel element with 2 fuel plates.
#0-3224 & 0-5495. plus 1 natural drift
#3.

Water ht = 60.30 cm. Temp °C
+ Per 22.3 °C

$\bar{v} = 58.67 \text{ m} = 19.6 \text{ f}$
0.925 Water ht = 52.35 cm
System just critical
Drain.

Core = 240.0 - 13.0 - 14.6
= 212.4 f

H.F.I.R.
Cores # 72-0 & 72-1
No Combs.

Have cores 72-0 & 72-1 ensemble in
small reflection tank. Inner core spaced
"375" with plastic spacers.
H₂O = 48.26 cm = Top of fuel plates in outer element.
" = 48.90 cm = " " " " " inner "

1.315 Water ht = 60.20 cm
System sub critical
Drain.

acc:

H.F.I.R.
Cores # 72-0 & 72-1

Have spent fuel element with 2 fuel plates. # D-322 & D-5495. Plus natural strip # 4

Water ht = 60.10 cm Temp °
+ Res 22.8 °

$E = 93.44 \mu\text{C} = 10.5 \mu\text{C}$

1416 Water ht = 53.10 cm
System just critical
Drain

$E_{net} = 240.0 - 13.3 - 10.5 = 216.2 \mu\text{C}$

H.F.I.R.

Cores # 65-0 & 65-1
2 Combs, Top & Bottom.

Now have cores # 65-0 & 65-1 assemble in small reflector tank. Spacers were spaced .375."

H₂O = 48.20 cm = Top of fuel plates in outer element
" = 48.80 cm = " " " " " inner element.

1545 Water ht = 60.10 cm
System sub-critical
Drain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	Meter ✓	1"	✓	3 X 10 ⁻¹²
"	"	Feet ✓	"	✓	"
K-2	"	Meter ✓	"	✓	"
"	"	Feet ✓	"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	1.5"	✓	500V
PM-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

- Equipment checked by I.D.C. A.A.M. Personnel check by F.I.D.C.
- Instruments and safeties checked and reset by A.A.M.
- Source in checked by A.A.M. Source No. M-43
- Emergency equipment in contact room checked by F.I.D.C.
- Instruments in trip checked: K-1-2 PM-1-2
- Red alarm on by A.A.M. Time 0915
- Start-up card by F.I.D.C. A.A.M. Date 7-18-68

over

H.F.I.R.
Cores 65-0 & 65-1
2 Cores Top & Bottom.

Now have spent fuel element with 2 fuel plates #D-3224, 0-5495, plus 1 enriched strip #5.

Water ht = 60.10 cm
+ Pres

Temp °C
23.0°C

$T = 82.57 \text{ sec} = 11.4 \text{ f}$

0905 Water ht = 52.90 cm.

System just critical
Drain.

Core = $240.0 - 23.8 - 11.4$
 $= 204.8 \text{ f}$

H.F.I.R.
Cores 64-0 & 64-1
2 Cores Top & Bottom

Have cores 64-0 & 64-1 assemble in small reflector tank. Inner core spaced, 375" with plastic spacers.

H₂O = 48.20 cm = top of fuel plate in outer element.
" = 48.80 cm = " " " " inner "

1533 Water ht = 60.10 cm
System sub critical
Drain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	1"	✓	3X10 ⁻¹²
"	"	Fast ✓	"	✓	"
K-2	"	Meter ✓	"	✓	"
"	"	Fast ✓	"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	✓	500V
PM-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80
DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.O.C. Personnel check by F.O.C.
 Instruments and safeties checked and reset by A.H.V.
 Source in checked by A.H.V. Source No. M-93
 Emergency equipment in control room checked by F.O.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red lights on by A.H.V. Time 1020
 Start-up OK'd by F.O.C. A.H.V. Date 2-19-69

H.F.I.R.
Cores 64-0 & 64-1
2 combes Top & Bottom.

Have spent fuel element with 2 fuel plates
D-3224 & D-5495. Plus 1 enriched strip
#9.

1055 Water ht = 60.10 cm Temp °C
System just critical 23.0 °C
Drain. Core = 240.0 - 26.3
= 213.74

H.F.I.R.
Cores 63-0 & 63-1
2 combes Top & Bottom.

Have cores 63-0 & 63-1 assemble in small
reflector tanks. Inner core spaced .375"
with plastic spacers.

H₂O = 48.30 cm = top of fuel plates in outer core
" = 48.90 cm = " " " " inner "

1529 Water ht = 60.20 cm
System sub-critical
Drain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Water	1"	✓	3×10^{-12}
"	"	"	"	✓	"
K-2	"	Water	"	✓	"
"	"	"	"	✓	"
R-1					
R-2					
PM-1	700V	Alarm	1.5"	✓	500V
PM-2	1200V	Low	10"	✓	900V
"	"	Alarm	2"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80
DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by AKC
Instruments and calibration checked and reset by AKC
Source is checked by AKC Date 19-43
Inventory equipment in core by F.P.C.
Instruments in trip status: K-1-2 PM-1-2
Ref. Date on AKC Date 1945
Source checked by F.P.C. Ruff Date 7-20-69

H.F.I.R
 Core 63-0 + 63-1
 2 combos top & bottom.

Have spent fuel elements with 2 fuel plates
 # D-3224 + D-5495. Plus 1 natural strip #2

Water ht = 60.20 cm Temp °C
 + Per 23.5°

$E = 67.36 \text{ neu} = 13.3 \phi$

1533 Water ht = 52.55 cm
 System just critical
 Drain

Core = $240.0 - 13.3 - 13.3$
 $= 213.4 \phi$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	STARTUP RANGE
K-1	3×10^{-12}	Water ✓	1"	✓	3×10^{-12}
"	"	Per ✓	"	✓	"
K-2	"	Water ✓	"	✓	"
"	"	Per ✓	"	✓	"
R-1					
R-2					
PM-1	700 500	Alarm ✓	5"	✓	500
PM-2	1200 1200	Low ✓	10"	✓	1200
"		Alarm ✓	2"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by AKM
 Source is checked by AKM Source No. M-43
 Emergency equipment is checked and checked by F.D.C.
 Instrument K-1-2 PM-1-2
 Rod AKM 0820
 Start-up time F.D.C. AKM 2-24-68

H.F.I.R
 Core 63-0 + 63-1
 2 combos top & bottom.

Check of core 63-0 + 63-1 with 4 fuel
 plates #D-3224 + D-5495. D-3242, D-2870
 and 6 enriched strips # 2, 3, 7, 8, 9, 10.

Water ht = 61.50 cm Temp °C
 + Per 22.7°

$E = 80.40 \text{ neu} = 11.7 \phi$

0911 Water ht = 52.30 cm
 System just critical
 Drain

Core = $391.0 - 155.9 - 11.7$
 $= 223.4 \phi$

Recheck of hot run. After checking alignment of enriched strips. Found some strips had moved from center.

Water ht = 60.15 cm Temp °C
 + Per 23.3
 $t = 43.46 \text{ sec} = 18.0 \text{ f}$

1448 Water ht = 51.60 cm
 System just critical
 Drain. $\text{com} = 391.0 - 155.9 - 18.0$
 $= 217.1 \text{ f}$

Repeat of above. Now have spent fuel elements with 2 fuel plates # 0-3222 + 0-5995, plus enriched strip # 7.

Water ht = 61.15 cm Temp °C
 + Per 23.5
 $t = 756.20 \text{ sec} = 1.6 \text{ f}$

1603 Water ht = 57.40 cm
 System just critical
 Drain. $\text{com} = 240.0 - 23.8 - 1.6$
 $= 214.6 \text{ f}$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	1"	✓	3×10^{-12}
"	"	Fail ✓	"	✓	"
K-2	"	Meter ✓	"	✓	"
"	"	Fail ✓	"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	.5"	✓	500V
PM-2	1200V	Low ✓	.10"	✓	900V
"	"	Alarm ✓	.2"	✓	"
LOG N CALIBRATE ✓			OPERATE ✓	SOURCE No.	13-804
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.P.C.
 Instruments and gauges checked and reset by A.M.H.
 Source to be used by A.M.H. Source No. 19-43
 Dumping equipment in critical room checked by F.D.C.
 Indicator lights checked: K-1-2 PM-1-2
 Red light on by A.M.H. Time 0820
 Start-up CR'd by F.D.C. A.M.H. Date 2-25-69

H.F.I.R.

Cores # 57-0 + 57-1
2 Cores on top, 3 Cores on bottom.

Have cores 57-0 + 57-1 assemble in small
reflector tank. Inner core spaced .375" with
plastic spacers.

H₂O = 48.35 cm = Top of fuel plate in outer element.
" = 48.85 cm = " " " " inner " "

0900 Water ht = 61.0 cm Temp °C
System sub critical 23.5 °C
Drain.

Now have spent fuel element with 2 fuel
plates # 0-3224 + 0-5495. Plus enriched
Strip # 6.

Water ht = 61.05 cm Temp °C
-Per. 23.5 °C

1015 Drain
C = -1103.9 sec = -1.2 f
Core = 240.0 + 1.2 - 23.8
= 217.4

Removed enriched strip #6 and added
natural strip #4.

Water ht = 60.20 cm Temp °C
+Per. 23.7 °C

C = 89.09 sec = 10.8 f
1046 Water ht = 52.90 cm
System just critical
Drain. Core = 240.0 - 13.3 - 10.8
= 215.9

H.F.I.R.

Cores 58-0 + 58-1

Have cores 58-0 + 58-1 assemble in small
reflector tank. Inner core spaced .375" with
plastic spacers.

1330 Water ht = 60.20 cm Temp °C
System Sub critical 23.9 °C
Drain.

H₂O = 48.20 cm = Top of fuel plate in outer element.
" = 48.85 " = " " " " inner " "

Now have part fuel element with 2 fuel plates 40-3224 & 40-3485. Also enriched strip #6.

Water ht = 60.20 cm Temp °C
 + Per 24.1 °C
 $t = 93.44 \mu s = 10.4 \mu$

1432 Water ht = 53.10 cm
 system just critical
 Drain. Core = 240.0 - 23.8 - 10.4
 = 205.8 μ

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE RANGE	SET	START-UP RANGE
K-1	3×10^{-12}	Motor ✓	1"	✓	3×10^{-12}
"	"	Fast ✓	"	✓	"
K-2	"	Motor ✓	"	✓	"
"	"	Fast ✓	"	✓	"
R-1					
R-2					
PA-1	700 V	Alarm ✓	5"	✓	5000
PA-2	1200 V	Low ✓	10"	✓	9000
"	"	Alarm ✓	2"	✓	"
LOG IN CALIBRATE ✓		OPERATE ✓		SOURCE No. B-80	
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by ^{F.I.D.C.} AKC Personnel check by AKC
 Instruments and safeties checked and reset by AKC
 Source in checked by AKC Source No. M-23
 Emergency equipment in control room checked by F.I.D.C.
 Instruments in trip circuit: K-1-2 PA-1-2
 Red light on by AKC Time 0800
 Start-up OK'd by F.I.D.C. AKC Date 2-26-69

Have core 59-0 & 59-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

0848 Water ht = 60.20 cm
System sub critical
Drain

H₂O = 48.3 cm = Top of fuel plates in outer element.
" = 48.8 cm = " " " " inner " "

Have spent fuel element with 2 fuel plates # 0-3224 & 0-5495. Plus 1 natural strip # 4.

Water ht = 60.35 cm
+ Per Temp °C
24°C

0955 Water ht = 54.50 cm
System just critical
Drain - Core = 240.0 - 13.3 - 5.8
= 220.94

Have cores 60-0 & 60-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

Water ht = 60.10 cm
System sub critical
Drain Temp °C
24.2°C

1330

H₂O = 48.15 cm = Top of fuel plates in outer element.
" = 48.8 cm = " " " " inner " "

Have spent fuel element with 2 fuel plates # 0-3224 & 0-5495. Plus 1 enriched strip # 1

Water ht = 60.10 cm
+ Per Temp °C
24.3°C

1500 Water ht = 52.40 cm
System just critical
Drain Core = 240.0 - 27.2 - 14.3
= 198.504

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SET	START-UP RANGE
K-1				
K-2				
R-1				
R-2				
PM-1				
PM-2				

LOG N CALIBRATE _____ SOURCE No. _____

DUMP WELL PROBE LIGHT _____

INSTRUMENT	RANGE	TRIP	SET	START-UP RANGE
K-1	3×10^{-12}	✓	1"	3×10^{-12}
"	"	✓	"	"
K-2	"	✓	"	"
"	"	✓	"	"
R-1				
R-2				
PM-1	700V	✓	15"	500V
PM-2	1200V	✓	10"	900V
"	"	✓	2"	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by F.P.C. / H.H. Personnel check by AKL
 Instruments and safeties checked and reset by AKL
 Source in checked by AKL Source No. M-23
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKL Time 0830
 Start-up OK'd by F.P.C. / H.H. Date 2-27-69

H.F.I.R.

Cover 61-0 & 61-1
 2 covers Top & Bottom.

Have covers 61-0 & 61-1 assemble in small reflector tank. Inner cover spaced .375" with plastic spacers.

H₂O = 48.30 cm = Top of fuel plates in outer element
 " = 49.00 cm = " " " " inner "

Water at 60.30 cm.
 System sub critical
 0950 Quinn

Temp °C
 24.2 °C

avg:

Have spent fuel element with 2 fuel plates
 # D-3222 & D-5495. Plus 2 natural strips
 #s 2 & 4.

Water ht = 60.30 cm Temp °C
 + Per 24.3°C

C = 133.64 new = 7.8 f
 Water ht = 53.85 cm
 System just critical
 Drain core = 240.0 - 26.6 - 7.8
 = -205.6 f

H.F.I.R
 Core 62-0 & 62-1

Have core 62-0 & 62-1 assembled in
 small reflector tank. Inner core spaced
 .375" with plastic spacers.

Water ht = 60.10 cm Temp °C
 System sub-critical 24.5°C
 1535 Drain

H₂O = 48.20 cm = Top of fuel plates in outer element
 " = 48.00 cm = " " " " inner "

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3x10 ⁻¹²	Motor ✓	1"	✓	3x10 ⁻¹²
"	"	Fest ✓	"	✓	"
K-2	"	Motor ✓	"	✓	"
"	"	Fest ✓	"	✓	"
R-1					
R-2					
PM-1	700 V	Alarm -	5"	✓	500 V
PM-2	1200 V	Low ✓	10"	✓	900 V
"	"	Alarm -	2"	✓	"

LOG N CALIBRATE _____ OPERATE _____ SOURCE No. B-80
 DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by I.D.C. [Signature] Personnel check by F.O.C.
 Instruments and safeties checked and reset by [Signature]
 Source in checked by [Signature] Source No. M-43
 Emergency equipment in control room checked by F.O.C.
 Instruments in trip circuit: K-120M-12
 Red light on by [Signature] Time 0825
 Start-up OK'd by F.O.C. [Signature] Date 2-28-69

H.F.I.R
Cores # 62-0 & 62-1

Have spent fuel element with 2 fuel plates # 0-3229 & 0-5495. Plus 1 natural strip # 4.

Water hts = 60.10 cm Temp °C
+ Pres 24.3 °C

$\bar{v} = 134.73 \text{ sec} = 7.8 \text{ f}$

0922 Water hts = 53.85 cm
System just critical
Drain.

Com = 240.0 - 13.3 - 7.8
= 218.9 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter -	1"	-	3×10^{-12}
"	"	Fast -	"	-	"
K-2		Meter			
		Fast			
R-1					
R-2					
PM-1	700V	Alarm -	5"	-	500V
PM-2	1200V	Low -	10"	-	900V
"	"	Alarm ✓	2"	-	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.I.R.C. Personnel check by F.I.R.C.
 Instruments and safeties checked and reset by A.K.W.
 Source in checked by A.K.W. Source No. M-43
 Emergency equipment in control room checked by F.I.D.C.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by A.K.W. Time 0810
 Start-up OK'd by F.I.D.C. A.K.W. Date 6-4-69

H.F.T.R.

Cores # 74-0 + 74-1

No Combs Top or Bottom

Have cores 74-0 + 74-1 assembled in
small reflector tanks. Inner core spaced
.375" with plastic spacers.

Feed rate = 4.3 cm/min.

3/4" Drain = 10.5 cm/min.

3" Drain = 26.4 cm/10 sec.

H₂O = 44.9 cm = Top of fuel ^{plate} in inner element.

Water ht = 60.1 cm
system sub critical
Drain

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	Meter ✓	1"	✓	3 X 10 ⁻¹²
"	"	Fast ✓	"	✓	"
K-2		Meter		—	—
		Fast		—	—
R-1					
R-2					
PM-1	7000	Alarm ✓	.5"	✓	5000
PM-2	12000	Low ✓	10"	✓	9000
"		Alarm ✓	2"		"
LOG N CALIBRATE		✓	OPERATE	✓	SOURCE No. 17-80
DUMP WELL PROBE LIGHT					

START-UP CHECK LIST

Equipment checked by R.K.M. Personnel check by R.K.M.
 Instruments and safeties checked and reset by A.T.H.
 Source in checked by A.H.H. Source No. M-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by A.T.H. Time 0845
 Start-up OK'd by F.D.C. R.K.M. Date 6-5-69

H.F.I.R. Contd
74-0 + 74-1

Have spent fuel element with 2 fuel plates # D-3224 + D-5495. Plus 2 natural strips # 2 + 4.

Water ht = 60.30 cm $\Delta h = 7.0$ cm Temp °C
+ Per 25.5 °C

$$T = 106.48 \text{ sec} = 9.44 = 1.34 / \text{cm}$$

0951 Water ht = 53.30 cm

System just critical

Drain. Core = 240.00 - 26.60 - 9.4
= -204.04 ✓

Core # 76-0 + 76-1

No Cond. Tap or Bottom:

Have core 76-0 + 76-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

H₂O = 48.80 cm = Top of fuel plates in lower core.

1053 Water ht = 60.0 cm
System sub critical
Drain.

Core # 76-0 + 76-1

Have spent fuel element with 2 fuel plates # D-3224 + D-5495. Plus 2 natural strips # 3 + 5.

Water ht = 60.15 cm $\Delta h = 7.85$ cm Temp °C
+ Per 25.7 °C

$$T = 65.19 \text{ sec} = 13.24 = 1.74 / \text{cm}$$

1317 Water ht = 52.30 cm

System just critical

$$\text{Core} = 240.00 - 26.00 - 13.2 \\ = 200.80 \checkmark$$

1319 Water ht = 51.70 cm
3-Per

$$T = -356.37 \text{ sec} = -4.14$$

1330 Water ht = 52.30 cm

System just critical
Drain.

$$\Delta h = -.60 \text{ cm}$$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	✓	1"	3 X 10 ⁻¹²
"	"	✓	"	"
K-2	—	Water	—	—
	—	Exp	—	—
R-1	—	—	—	—
R-2	—	—	—	—
PM-1	700V	Alarm ✓	5"	500V
PM-2	1200V	Low ✓	10"	900V
"	"	Alarm ✓	2"	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. AKU Personnel check by F.P.C.
 Instruments and safeties checked and reset by AKU
 Source is checked by AKU 19-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip checked by AKU PM-1-2
 Red light on by AKU 0805
 Start-up OK'd by F.P.C. AKU Date 6-6-69

Cons # 76-0 & 76-1

New spent fuel element with fuel plate # D-3224, D-5495, D-3242, D-2870. Plus 6 enriched strips # 2, 3, 7, 8, 9, 10, and 3 natural strips # 2, 3, 4.

Water ht = 60.35 cm Temp °C
 1 - Per 25.7 °C
 H.G

0900 Drain:

Removed natural strip # 3.

Water ht = 60.80 cm Temp °C
 2 + Per 25.7 °C

U = 325.95 sec = 3.6 f
 0945 Water ht = 55.50 cm
 System just critical
 Drain. Conc = 391.0 - (155.90 + 26.60 + 3.6)
 = 204.9 f

Cons 77-0 & 77-1
No comb. top on bottom.

Now have cons 77-0 & 77-1 ensemble in small regulator tank. Inner core spaced .375" with plastic spacers.

H₂O = 48.70 cm = top of fuel plate in inner core.

1300 Water ht = 60.30 cm Temp °C
System sub critical 26.0 °C
Drain.

Have spent fuel element with 2 fuel plates #D-3224 and D-5495. Plus 2 natural strips #S 2 & 3

1400 Water ht = 60.30 cm Temp °C
System sub critical 26.1 °C
Drain.

Removed natural strip #2.

over #33

1428 Water ht = 60.40 cm Temp °C
System sub critical 26.2 °C
Drain.

Removed natural strip #3. Now have spent fuel element with 2 fuel plates #D-3224 & D-5495.

Water ht = 60.40 cm Temp °C
+ Per. 26.2 °C

$T = 178.19 \text{ m} = 6.2 \text{ f}$

Water ht = 54.40 cm.

System just critical
Drain. $\text{cm} = 240.00 - 6.2 \text{ f}$
 $= 233.80 \text{ f}$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	1"	3×10^{-12}
"	"	Fast ✓	"	"
K-2	"	Meter	"	"
"	"	Fast	"	"
R-1	"	"	"	"
R-2	"	"	"	"
PM-1	700V	Alarm ✓	5"	500V
PM-2	1200V	Low ✓	10"	900V
"	"	Alarm ✓	2"	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by F.P.C.
 Instruments and safeties checked and reset by A.K.V.
 Source in checked by A.K.V. Source No. M-83
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: R-1 PM-1-2
 Red light on by A.K.V. Time 0950
 Start-up OK'd by F.P.C. A.K.V. Date 6-9-69

H.F. I.R.

Core 73-0 & 73-1

No comb top or bottom.

Have core 73-0 & 73-1 assemble in small reflector tank, have core spaced - .375" with plastic spacers.

H₂O = 48.80 cm = top of fuel plate in inner cone.

1025 Water ht = 60.10 cm
 System sub critical
 Drain.

Temp °C
 25.5°C

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	1"	✓	3×10^{-12}
"	"	Fast ✓	"	✓	"
K-2	-	Meter -	-	-	-
"	-	Fast -	-	-	-
R-1	-	-	-	-	-
R-2	-	-	-	-	-
PM-1	700V	Alarm ✓	5"	✓	500V
PM-2	1200V	Low ✓	10"	-	900V
"	"	Alarm ✓	2"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by AMH
 Source in checked by AMH Source No. M-93
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by AMH Time 0820
 Start-up OK'd by F.D.C. AMH Date 6-10-69

H.F.L.R.
 Core # 73-0 + 73-1

Have spent fuel element with two fuel plates #5 0-3224 & 0-5495. plus two natural strips # 2 & 5.

0853 Water ht = 60.30 cm Temp °C
 System sub critical
 Drain. 25.0°C

Removed natural strip #5.

Water ht = 60.90 cm Temp °C
 + Res 25.0°C

$E = 191.22 \text{ me} = 5.8 \phi$

0923 Water ht = 54.50 cm
 System just critical
 Drain.

$\text{Core} = 290.00 - 13.3 - 5.8$
 $= 270.90 \phi$

H.F.I.R. Covers

75-0 & 75-1
No covers top or bottom.

Have covers 75-0 & 75-1 assemble in small reflector tank. Inner core spaced, 375" with plastic spacers.

H₂O = 48.80 cm = Top of fuel plates in inner core.

1345 Water ht = 60.20 cm Temp °C
System sub critical
Drain

Have spent fuel element with 2 fuel plates. #50-3224 and D-5495. plus 1 natural strip #5.

Water ht = 60.30 cm Temp °C
H₂O 25.2°C

1448 Water ht = 51.90 cm
System just critical
Drain
Core = 240.00 - 16.90 - 13.0
= 210.10 ft

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 x 10 ⁻¹²	Meter ✓	1"	✓	3 x 10 ⁻¹²
"	"	Fast ✓	"	✓	"
K-2	—	Meter —	—	—	—
"	—	Fast —	—	—	—
R-1	—	—	—	—	—
R-2	—	—	—	—	—
PM-1	700V	Alarm ✓	5"	✓	500V
PM-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80
DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
Instruments and safeties checked and reset by AKM
Source in checked by AKM Source No. 16-93
Emergency equipment in control room checked by F.D.C.
Instruments in trip circuit: K-1, PM-1-2
Red light on by AKM Time 10.00
Start-up OK'd by F.D.C. AKM Date 6-11-68

H.F.I.R.
Cores 75-0 & 75-1

Repeat of experiment described on page 38.
except now have 2 natural strips
4 & 5.

Water ht = 60.20 cm.
+ Per

Temp °C
25.0 °C

$T = 591.06 \text{ sec} = 2.14$

Water ht = 56.60 cm
System just critical
Drain.

$$\text{Core} = 240.00 - 26.30 - 2.1 \\ = -211.60 f$$

Outer core # 75-0. Inner Core 77-1
Now have cores 75-0 & 77-1 with 2 sput fuel
plates, plus 2 natural strips # 4 & 5.

1311 Water ht = 60.30 cm
System sub-critical
Drain.

Removed natural ~~strip~~ # 5.

Water ht = 60.50 cm.
+ Per

Temp °C
25.0 °C

$T = 156.46 \text{ sec} = 6.94$

1342 Water ht = 54.20 cm
System just critical
Drain.

$$\text{Core } 75-0 \text{ \& } 77-1 = 240.00 - 13.3 - 6.9 \\ = -219.80 f$$

Outer core # 77-0. Inner core 75-1

Now have cores 77-0 & 75-1 with 2 sput
fuel plates, plus 1 natural strip # 5.

1522 Water ht = 60.40 cm
System just critical
Drain.

Temp °C
25.2 °C

$$\text{Core} = 240.00 - 13.0 \\ = -227.00 f$$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP RANGE
K-13 K10-12		Meter <input checked="" type="checkbox"/>	1"	<input checked="" type="checkbox"/>	3 K10-12
"		Fast <input checked="" type="checkbox"/>	"	<input checked="" type="checkbox"/>	"
K-2		Meter <input checked="" type="checkbox"/>	"	<input checked="" type="checkbox"/>	"
"		Fast <input checked="" type="checkbox"/>	"	<input checked="" type="checkbox"/>	"
P-1					
P-2					
PM-1 700V		Alarm <input checked="" type="checkbox"/>	1.5"	<input checked="" type="checkbox"/>	500V
PM-2 1200V		Low <input checked="" type="checkbox"/>	8"	<input checked="" type="checkbox"/>	900V
"		Alarm <input checked="" type="checkbox"/>	1"	<input checked="" type="checkbox"/>	"

LOG IN CALIBRATE _____ OPERATE _____ SOURCE No. _____
 DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by F.P.C. AKA Personnel check by F.P.C.
 Instruments and safeties checked and reset by AKA
 Source in checked by AKA Source No. M-93
 Emergency equipment in control area checked by F.P.C.
 Instruments in trip circuits: K-1-2 PM-1-2
 Red light on by AKA Time 0810
 Start-up OK'd by F.P.C. AKA Date 11-12-69

Have CE-2 core assembly in small reflector tank. (Core only) the 6 inner removable fuel plate removed.

Fuel rate = 4.3 cm/min. Top of outer core H₂O = 47.30 cm
 Drain 3/4" rate = 10.0 cm/min. " " inner " H₂O = 47.55 cm
 Drain 3.0" rate = 24.2 cm/10 min.

0912 Water ht = 60.0 cm Temp °C
 System sub critical 23.5°C
 Drain

Installed spent fuel element in CE-2. Have 3 fuel plates. # D-3224, D-5495 & D-3242. Plus 1 fuel plate in inner core.
 Water ht = 49.10 cm Temp °C
 + Per 23.5°C

1015 Water ht = 48.40 cm
 System just critical
 Drain.

over:

REQUISITION

684592

68 DEC 16 AM 9:37

REPORT TO

A. K. Ready

BUILDING NO.

9213

PHONE NO.

3-5237

00000032	g U/g
	g Ar/g
	g D/g
	g H/g
	g Mo/g
	g F/g
	SPEC.
	ASSAY

AO	REPT. BY
12-18-69	DATE
Jr	DEPT.

1038 Water ht = 49.20 cm.
2 + Per

Temp °C
23.6°C

1045 Start of exposure run:

1054 Water ht = 48.45 cm
System just initiated

1115 Drain:

12-15-69 H₂O sample taken from small reflectors tanks.

Rep # 684592

Orls for:

1 - g w/g

2 spec (ppm 40)

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	5"	✓	3X10 ⁻¹²
"	"	Fast ✓	2.5"	✓	"
K-2	"	Meter ✓	6"	✓	"
"	"	Fast ✓	2"	✓	"
R-1					
R-2					
PM-1	700 V	Alarm ✓	1"	✓	500 V
PM-2	1200 V	Low ✓	3"	✓	900 V
"	"	Alarm ✓	2"	✓	"

LOG & CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by D.C. A.H.H. Personnel check by D.C.

Instruments and safeties checked and reset by A.H.H.

Source in checked by A.H.H. Source No. 19-93

Emergency equipment in control room checked by A.H.H.

Instruments in trip circuit: K-1-2 PM-1-2

Red light on by A.H.H. Time 0820

Start-up OK'd by D.C. A.H.H. Date 12-23-69

Feed rate = 4.3 cm/min.

3/4" drain rate = 9.9 cm/min.

3.0" dump rate = 24.3 cm/min.

H.F.I.R. Coils
83-0 & 83-F

H₂O = 48.75 cm = top of outer fuel plate.
" = 49.00 cm = "inner" " "

Have H.F.I.R. coils # 83-0 & 83-1 assembled
in small replication tank. Brown core spaced
.375" with plastic spacers.

1000 Water ht = 60.30 cm Temp °C
System sub critical 25.1 °C
Drain.

Now have spent fuel element installed. 2 fuel
plates # D-3224 & D-5495. plus two natural
strips # 2 & 4.

1047 Water ht = 60.00 cm Temp °C
System sub critical 25.1 °C
Drain.

1110 Removed natural strip # 2.
Water ht = 60.00 cm Temp °C
System sub critical 25.5 °C
Drain.

p-47

1136 Removed natural strip # 4.
Water ht = 60.10 cm Temp °C
System sub critical 25.55 °C
Drain.

Added 2 fuel plates: D-3242 & D-2870. plus
5 enriched strips # 3, 7, 8, 9, ~~10~~ and 1 natural
strip # 2.

1305 Water ht = 60.0 cm
System sub critical
Drain.

1325 Removed natural strip # 2.
Water ht = 60.0 cm Temp °C
System sub critical 25.6 °C
Drain.

1347 Removed enriched strip # 9.
Water ht = 60.0 cm Temp °C
System sub critical 25.7 °C
Drain.

p-48

Remained enriched strip #8. (4 fuel plates & enriched strip 2, 3 & 7.

Water ht = 60.30 cm $\Delta h = 8.1$ cm Temp $^{\circ}C = 26.0^{\circ}C$
 1 + Per

$E = 59.32 \text{ cm} = 15.5 \text{ g} = 1.9 \text{ g/cm}$

1422 Water ht = 57.20 cm

System just critical

Drain: $\text{Core} = 391.00 - 76.80 - 15.5 = -298.70 \text{ g}$

C.E - 2 Core:

Have C.E - 2 core plus spent fuel elements with 4 fuel plates, D-3224, D-5495, D-3242, D-2870, plus enriched strips # 4, 8, 10, plus natural strip # 2.

Water ht = 59.10 cm $\Delta h = 8.5$ cm Temp $^{\circ}C$
 2 + Per

$E = 49.98 \text{ cm} = 16.4 \text{ g} = 1.9 \text{ g/cm}$

1533 Water ht = 50.60 cm

System just critical Temp $^{\circ}C = 26.0^{\circ}C$

Drain: $\text{Core} = 391.00 - 92.20 - 16.4 = -282.40 \text{ g}$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter -	6"	-	3X10 ⁻¹²
"	"	Fast -	3"	-	"
K-2	"	Meter -	5"	-	"
"	"	Fast -	2.5"	-	"
P-1					
P-2					
PA1	700V	Alarm -	5"	-	500V
PA2	1200V	Low -	12"	-	900V
"	"	High -	5"	-	"
LOG IN CALIBRATE		OPERATE	SOURCE No. B-80		
DUMP WELL PROBE LIGHT					

START-UP CHECK LIST

Equipment checked by P.C. Hall Personnel check by P.C.
 Instruments and safeties checked and reset by P.C. Hall
 Source in checked by P.C. Hall Source No. M-43
 Emergency equipment in control room checked by P.C. Hall
 Instruments in trip circuit: K-1-2 AM-1-2
 Red light on by P.C. Hall Time 0745
 Start-up OK'd by P.C. Hall Date 12-24-69

C.E. 2 Core.

Repeat of last experiment, p-48

Water ht = 59.20 cm $dh = 7.8$

+ Per

Temp °C
25.5

$$C = 89.09 \text{ cm} = 10.8 \text{ f} = 1.4 \text{ f/cm}$$

0823 Water ht = 51.40 cm

System just critical

Drain.

$$\text{Core} = 391.00 - 92.2 - 10.8 \\ = -288.00 \text{ f}$$

Repeat with H.F.I.R. Core 83-0 + 83-1

Have spent fuel element with 4 fuel plates # D-3229, D-5495, D-3242 & D-2870 plus enriched strips # 2, 3, & 7.

Water ht = 60.10 cm $dh = 7.7 \text{ cm}$

+ Per

Temp °C
25.5

$$C = 63.02 \text{ cm} = 13.9 \text{ f} = 1.8 \text{ f/cm}$$

0944 Water ht = 52.40 cm

System just critical

Drain.

$$\text{Core} = 391.00 - 76.80 - 13.9 \\ = -300.3$$

H.F.I.R. Core 82-0 + 82-1

Have H.F.I.R. Cores 82-0 + 82-1 assembled in small reflector tank, inner core spaced .375" with plastic spacers.

1322 Water ht = 60.2 cm

System sub critical

Drain.

Temp °C
~~25.5~~ 25.5

Have spent fuel element with 4 fuel plates # D-3229, D-5495, D-3242, D-2870. plus 6 enriched strips # 2, 3, 7, 8, 9, 10, and natural strip # 4

1448 Water ht = 60.20 cm

System sub critical

Drain.

Temp °C
26.0

Removed 2 enriched strips # 2 & 7.

1512 Water ht = 60.20 cm

System sub critical

Drain.

Temp °C
25.7

over.

Removed natural strip # 4.

Vo

Water ht = 60.10 cm
+ pen

Temp °C
25.9°C

$\delta = 197.74 \mu = 5.6 \mu$

1558 Water ht = 54.45 cm
system just critical
chain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	2"	✓	3×10^{-12}
"	"	Fast ✓	1.5"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Fast ✓	1.5"	✓	"
R-1					
R-2					
7000		Alarm ✓	1.5"	✓	5000
12000		Low ✓	10"	✓	9000
"		Alarm ✓	2"	✓	"

LOG H CALIBRATION _____ OPERATE _____ SOURCE No. B-80

DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by F.P.C.
 Instruments and safeties checked and reset by A.K.H.
 Source in checked by A.K.H. Source No. M-9-3
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.K.H. Time 1010
 Start-up OK'd by F.P.C. A.K.H. Date 1-5-70

Repeat of last experiment (12-24-69). Have spent fuel element with 4 fuel plates #5 D-3224, D-5495, D-3242, D-2870. plus #5 enriched strips # 2, 4, 8, 9, 10 - ~~ATL~~ 1-5-70

Water h_t = 60.10 cm Temp °C
+ Per 25 °C

T = 304.22 sec = 3.84

1338 Water h_t = 55.50 cm

System just critical
Drain

$$\text{core} = 391 - 130.80 - 3.8$$

$$= -256.90$$

Have H.F.I.R. Core 84-0 + 84-1 assembly in small reflector tank. Inner core spaced .375" with plastic spacers.

1534 Water h_t = 60.20 cm Temp °C
System sub critical 25 °C
Drain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	STARTUP
K1	3 x 10 ⁻¹²	Meter ✓	2"	✓	3 x 10 ⁻¹²
"	"	Foot ✓	.5"	✓	"
K2	"	Meter ✓	2"	✓	"
"	"	Foot ✓	.5"	✓	"
R-1				✓	
P-2					
PM-1	700V	Alarm ✓	.5"	✓	500V
PM-2	1200V	Alarm ✓	10"	✓	900V
"	"	Alarm ✓	1"	✓	"

LOG IN OPERATE _____ OFFSTATE _____ SOURCE No. B-80

DAMP WELL FLUORE LIGHT _____

START-UP CHECK LIST

Equipment checked by ATL Personnel check by F.O.C.

Instruments and safeties checked and reset by ATL

Source in checked by ATL Source No. M-43

Emergency equipment in control room checked by F.O.C.

Instruments in trip circuit: R-1-2 PM-1-2

Red light on by ATL Time 0805

Start-up OK'd by F.O.C. ATL Date 1-6-70

Have spent fuel element with 4 fuel plates
 #^s D-3224, D-5495, D-3242, D-2870. plus
 6 enriched strips #^s 2,3,7,8,9,10.

0850 Water ht = 60.20 cm Temp °C
 System sub critical 25.5 °C
 Drain.

Removed enriched strip #9.

Water ht = 60.10 cm Temp °C
 + Per 25.5 °C

$$C = 321.60 \text{ sec} = 3.7 \text{ f}$$

0925 Water ht = 55.50 cm
 System just critical
 Drain.

$$\begin{aligned} \text{Core} &= 396.0 - 129.6 - 3.7 \\ &= 262.7 \text{ f} \end{aligned}$$

Have cores 78-0 & 78-1 assembled in small
 reflector tanks. Inner core spaced .375"
 with plastic spacers.

1035 Water ht = 60.10 cm Temp °C
 System sub critical 25.5 °C
 Drain.

Now have spent fuel element with
 2 fuel plates #^s D-3224, D-5495. No
 strips.

Water ht = 60.10 cm Temp °C
 2 + Per 25.5 °C

$$C = 39.11 \text{ sec} = 19.3 \text{ f}$$

1117 Water ht = 51.55 cm
 System just critical
 Drain

$$\begin{aligned} \text{Core} &= 240.00 - 19.3 \\ &= 220.70 \text{ f} \end{aligned}$$

Now have spent fuel element with 4 fuel
 plates #^s D-3224, D-5495, D-3242, D-2870.
 plus 6 enriched strips #^s 2,3,7,8,9,10.

Water ht = 60.15 cm Temp °C
 3 + Per 25.7 °C

$$C = 106.48 \text{ sec} = 9.4 \text{ f}$$

over!

1334 Water ht = 53.20 cm
 System just critical
 Drain. Core = 391.0 - 155.90 - 9.4
 = - 225.70 f

Repeat of experiment described on p-57. Have
 front fuel element with 2 fuel plate & 5
 D-3224, D-5495. No trips.

Water ht = 60.20 cm Temp = 25.7°
 + Per

E = 43.46 sec = 18.0 f

1505 Water ht = 51.65 cm
 System just critical
 Drain. Core = 240.00 - 15.0
 = - 222.00 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	Meter ✓	2"	✓	3 X 10 ⁻¹²
"	"	Fast ✓	1.5"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Fast ✓	1"	✓	"
R-1					
R-2					
PM-1	700 V	Alarm ✓	5"	✓	500V
PM-2	1200 V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"
LOG N CALIBRATE ✓			OPERATE ✓		SOURCE No. B-80
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

F.I.C.
 Equipment checked by A.M.L. Personnel check by F.I.C.
 Instruments and safeties checked and reset by A.M.L.
 Source in checked by A.M.L. Source No. M-43
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.M.L. Time 0815
 Start-up OK'd by F.I.C. A.M.L. Date 1-7-70

Have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870, plus 6 enriched strips #S 2, 3, 7, 8, 9, 10.

0916 Water ht = 60.30 cm Temp °C
System sub critical 25.2°C
Drain.

Removed enriched strip #7.

Water ht = 60.10 cm Temp °C
+ Per 25.5°C

$t = 34.77 \text{ sec} = 20.7 \text{ f}$

1004 Water ht = 51.30 cm
System just critical
Drain. $\text{core} = 391.0 - 132.10 = 20.7$
 $= -238.20 \text{ f}$

H.F.I.R. Core 78-0 & 83-1

Have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870, plus 5 enriched strips #S 2, 3, 8, 9, 10.

1336 Water ht = 60.15 cm Temp °C
System just critical 25.5°C
Drain. $\text{core} = 391.00 - 132.10$
 $= -258.90$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE EXPOSURE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	2"	✓	3×10^{-12}
"	"	Fast ✓	1"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Fast ✓	1"	✓	"
P-1					
P-2					
PA-1	700V	Alarm ✓	15"	✓	500V
PA-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	1"	✓	"
LOG IN CAMERAE ✓		OPERATE ✓	SOURCE No. B-80		
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by F.O.C. Personnel check by F.O.C.
 Instruments and safeties checked and reset by A.K.H.
 Source in checked by A.K.H. Source No. 19-43
 Emergency equipment in control room checked by F.O.C.
 Instruments in vault checked: K-1-2 PM-1-2
 End check by A.K.H. Time 0910
 Start-up OK'd by F.O.C. A.K.H. Date 1-8-70

Repeat of last experiment described on p-60.
Have spent fuel element with 4 fuel plates.
#S 0-3224, 0-5495, 0-3242, 0-2870, plus
5 enriched strips # 2, 3, 8, 9, 10.

Water ht = 60.20 cm.

Temp °C

- Per

25.0°

$\dot{C} = -1325.53 \text{ sec.}^{-1} = 1.0 \text{ f}$

0906 Drain.

core = $391.0 + 1.0 = 132.10$
= -259.90 f

Removed enriched strip #10. added natural
strip #2. Now have 4 fuel plates. Enriched
strips #^s 2, 3, 8, 9, and natural strip #2.

Water ht = 60.15 cm

Temp °C

2+ Per

25.2°

$\dot{C} = 84.75 \text{ sec.}^{-1} = 11.2 \text{ f}$

1000 Water ht = 52.80 cm

system just critical
Drain.

core = $391.0 - 118.90 = 11.2$

= -260.90 f

Have spent fuel element with 4 fuel plates
#^s 0-3224, 0-5495, 0-3242, 0-2870, plus 5
enriched strips #^s 2, 3, 8, 9, 10, plus 1 natural
strip # 2.

1120 Water ht = 60.10 cm

Temp °C

system sub critical
Drain.

25.3°

Removed natural strip #2. Now have 4
fuel plates, and 5 enriched strips #^s 2, 3, 8, 9, 10.

1305 Water ht = 60.10 cm

Temp °C

system sub critical
Drain.

25.3°

Removed enriched strip #9. Now have
4 fuel plates, and 4 enriched strips #^s 2, 3, 8, 10.

Water ht = ~~60.10 cm~~
60.10 cm

Temp °C

3+ Per

25.5°

$\dot{C} = 30.42 \text{ sec.}^{-1} = 22.5 \text{ f}$

1336 Water ht = 51.05 cm.

system just critical
Drain.

core = $391.0 - 105.90 = 22.5$

= -262.70

H.F.I.A. Core 82-0 & 82-1

Have spent fuel elements with 4 fuel plots
 #^s D-3229, D-5495, D-3242, D-2870. plus
 5 enriched strips #^s 2, 4, 8, 9, 10.

Water ht = 60.10 cm
 4 + Per

Temp °C
 25.6 °C

t = 230.39 sec = 4.94

1527 Water ht = 54.95 cm

system just critical
 Drain.

Core = 391.00 - 130.80 - 4.9
 = -255.30 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3010 ⁻¹²	M-Hr -	2"	-	3010 ⁻¹²
"	"	Per -	1"	-	"
K-2	"	M-Hr -	2"	-	"
"	"	Per -	1"	-	"
R-1					
R-2					
PM-1	700V	Alarm -	.5"	-	500V
PM-2	1200V	Low C	10"	-	900V
		Alarm -	2"	-	"

LOG N CALIBRATE _____ OPERATE _____ SOURCE No. _____

DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by F.V.C. Personnel check by F.V.C.
 Instruments and safeties checked and reset by A.K.L.
 Source in checked by A.K.L. Source No. M-43
 Emergency equipment in critical area checked by F.V.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Trip light on by A.K.L. Time 0900
 Start-up OK'd by F.V.C. A.K.L. Date 1-9-69

H.F.I.R. Cms 79-0 & 79-I.

Have H.F.I.R. Cms 79-0 & 79-I ensemble
in small reflector tank. Inner core
spaced .375" with plastic spacers.

1014 Water ht = 60.15 cm Temp °C
System sub-critical 25.3 °C
Drain.

Now have spent fuel element with 2 fuel
plates # 0-3224, 0-5495. plus 1 natural
strip # 2.

1103 Water ht = 60.10 Temp °C
System sub-critical. 25.5 °C
Drain.

Removed natural strip # 2. Now have on
2 fuel plates.

1121 Water ht = 60.10 cm Temp °C
System sub-critical 25.5 °C
Drain.

H.F.I.R. Cms 79-0 & 79-I

Now have spent fuel element with 4 fuel
plates, #s 0-3224, 0-5495, 0-3242, 0-2870.
plus 5 enriched strips #s 2, 3, 7, 8, 10.

Water ht = 60.15 cm Temp °C
' + Per 25.5 °C

$T = 60.84 \text{ sec} = 14.3 \text{ f}$

Water ht = 52.00 cm

System just critical
Drain.

Core = $391.0 - 129.6 - 14.3$
= -247.10 f

H.F.I.R. Cms 80-0 & 80-I

Have H.F.I.R. Cms 80-0 & 80-I ensemble
in small reflector tank. Inner core spaced
.375" with plastic spacers.

1525 Water ht = 60.10 cm Temp °C
System sub-critical 25.6 °C
Drain.

INSTRUMENT CHECK

1/12/70

INSTRUMENT	RANGE	TRIP	SOURCE	SET	STARTUP
K-1	3x10 ⁻¹²	Meter ✓	2 ⁹	✓	3x10 ⁻¹²
		Dist ✓	1/2 ¹	✓	
K-2	3x10 ⁻¹²	Meter ✓	2 ⁹	✓	3x10 ⁻¹²
		Dist ✓	2 ⁹	✓	
R-1	—				
R-2	—				
PM-1	500V	Alarm ✓	1/2 ¹	✓	500V
PM-2	1500V	Low ✓	10 ¹	✓	900V
		Alarm ✓	1 ¹	✓	
LCS IN CALIBRATE ✓		OPERATE ✓	SOURCE NO. 3-80		
DUMP WILL TRIP LIGHT ✓					

START-UP CHECK LIST

Final start checked by EQ, IDC Personnel check by IDC
 Instrument and cables checked and reset by EQ
 Source in checked by EQ Source No. 17-4B
 Emergency equipment & control room checked by IDC
 Instruments in trip circuits: K-1, K-2, PM-1, PM-2
 Red light on by IDC Time 0900
 Start-up time by IDC, EQ Date 1/12/70

1/12/70

80-0 + 80-I

Enriched strips 2, 3, 7, 8, 10 + Lateral strip 2.
 4 fuel plates in target region.
 0950 Water @ 60.3 cm. + Period #1 T=25.0°C
 t=82.57 sec = 11.4 f

1060

Water @ 52.7 cm. Critical.
 Drain. core = 391.00 - 142.90 - 11.4
 = -236.70 f

Removed 2 fuel plates and all strips.

Water lit = 60.20 cm Temp °C
 2 + Rev 25.0°C
 t = 119.51 sec = 8.6 f

1100

Water lit = 53.65 cm
 System just critical
 Drain. core = 240.00 - 8.6
 = -231.40 f

~~80-0~~

over.

Cores 81-0 & 81-E

Haul H.F.I.R. Cores 81-0 + 81-E assembly in small reflector tanks. Power core spaced .375" with plastic spacers.

1326 Water ht = 60.20 cm Temp °C
 System sub critical
 Chain 25.0°C

Have been spent fuel element with 2 fuel plates # D-3224 and D-5495.

Water ht = 60.30 cm Temp °C
 3 + Per 25.2°C

$t = 2259.92 \text{ sec} = .604$

Water ht = 58.20 cm.
 System just critical
 Chain

$\text{Core} = 240.0 - .60$
 $= -239.4 f$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	2"	✓	3X10 ⁻¹²
"	"	Fast ✓	.5"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Fast ✓	.5"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	.5"	✓	500V
PM-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	1"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by A.K.H.
 Source in checked by A.K.H. Source No. 17-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.K.H. Time 0810
 Start-up OK'd by F.D.C. A.K.H. Date 1-13-70

Now have spent fuel element with 4
fuel plates #^s 0-3224, 0-5495, 0-3242, 0-2970.
plus 5 enriched strips #^s 3, 7, 8, 9, 10.

Water ht = 60.20 cm Temp °C
+ Per 25°C

$$C = 45.63 \text{ sec} = 17.4 \text{ f}$$

0957 Water ht = 51.80 cm
System just critical
Drain. Core = $391.0 - 130.3 - 17.4$
= -24.30

Core 85-0 & 85-E

Have H. F. I. R. Cores 85-0 & 85-E assemble
in small reflector tank. Inner core spaced
.375" with plastic spacers.

1049 Water ht = 60.10 cm Temp °C
System sub-critical
Drain. 25°C

p 73

Now have spent fuel element with 2 fuel
plates #^s 0-3224, 0-5495.

Water ht = 60.20 cm Temp °C
2 + Per 25.2°C

$$C = 73.88 \text{ sec} = 12.9 \text{ f}$$

1313 Water ht = 52.65 cm
System just critical
Drain. Core = $290.0 - 12.4 =$
= -227.6 f

Now have 4 fuel plates #^s 0-3224, 0-5495,
0-3242, 0-2870. plus 6 enriched strips
#^s 2, 3, 7, 8, 9, 10.

Water ht = 60.10 cm Temp °C
3 + Per 25.3°C

$$C = 397.66 \text{ sec} = 3.0 \text{ f}$$

1504 Water ht = 55.70 cm
System just critical
Drain. Core = $391.0 - 155.9 - 3.0$
= -232.10 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter -	2"	-	3×10^{-12}
"	"	Ext ✓	.5"	-	"
K-2	"	Meter -	2"	-	"
"	"	Ext ✓	.5"	-	"
R-1					
R-2					
PA-1	700V	Alarm -	.5"	✓	500V
PA-2	1200V	Low ✓	10"	-	900V
"	"	Alarm ✓	1"	-	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL TRODE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by F.P.C.
AKV
 Instruments and safeties checked and reset by AKV
 Source is checked by AKV Source No. 19-93
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip checked: K-1-2 PM-1-2
 High level on by AKV Time 0815
 Start-up OK'd by F.P.C. AKV Date 1-18-70

H.F.I.R Core 85-0 + 85-I

Repeat of last experiment described on p-73

Water ht = 60.10 cm Temp °C
 + Per 25.0°C

$C = 634.52 \text{ sec} = 1.9 \text{ f}$

0.926 Water ht = 56.70 cm
 system just critical
 Drain.

Core = $391.0 - 155.9 - 1.9$
 = -233.2 f

H.F.I.R Core 86-0 + 86-1

Now have H.F.I.R core 86-0 + 86-1
 assembly in small reflector tank. Inner
 core spaced .375" with plastic spacers.

1050 Water ht = 60.10 cm Temp °C
 system sub critical
 Drain 25.1

over

H.F.I.R. Core 86-0 & 86-1

Now have spent fuel element with 2 fuel plates #s D-3224, & D-5495.

Water ht = 60.10 cm Temp °C
 2 + per 25.2 °C

C = 30.42 sec = 22.5¢
 Water ht = 51.20 cm
 System just critical
 Drain. Core = 240.0 - 22.5
 = -217.50¢

Now have spent fuel element with 4 fuel plates. #s D-3224, D-5495, D-3242, D-2870.
 plus 6 enriched strips #s 2, 3, 7, 8, 9, 10, and 1 natural strip # 4.

1508 Water ht = 60.00 cm Temp °C
 System just critical 25.3 °C
 Drain. Log n = .007

Core = 391 - 169.2 = 221.8 counts

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter			
"	"	Fast			
K-2	"	Meter	2"		
"	"	Fast	1.5"		
R-1					
R-2					
PM-1	700V	Alarm	1.5"		
PM-2	1200V	Low	10"		
"	"	Alarm	1"		

LOG N CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by ^{F.P.C.} A.T.H. Personnel check by F.P.C. - A.T.H.
 Instruments and safeties checked and reset by A.T.H.
 Source in checked by A.T.H. Source No. 19-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.T.H. Time 0803
 Start-up OK'd by F.P.C. A.T.H. Date 1-15-70

Repeat of last experiment described on
p - 76.

Water ht = 60.10 cm Temp °C
1 per Lag $\eta = .025$ 25.0°C
- 3129.12 sec = - .42 f

0915 Drain: core = 391.0 + .42 - 169.2
= 222.2 f

Removed natural strip #4. Now have
4 fuel plates and 6 enriched strips. (see
p - 76)

Water ht = 60.10 cm Temp °C
2 per 25.0°C

0951 $t = 67.36$ sec = 13.3 f
Water ht = 52.40 cm
System just critical
Drain: core = 391.0 - 155.9 - 13.3
= 221.80 f

Have core 83-0 & 83-1. With spent fuel
element with 4 fuel plates # 0-3224, 0-5495
0-3242, 0-2870. plus 3 enriched strips
2, 3, 7.

Water ht = 60.15 cm Temp °C
3 per 25.2°C

$t = 63.02$ sec = 13.9 f

1322 Water ht = 52.40 cm
System just critical
Drain: core = 391.0 - 76.8 - 13.9
= 300.3 f

Have Core 84-0 & 84-I, with 4 fuel plates
0-3224, 0-5495, 0-3242, 0-2870. plus
5 enriched strips # 2, 4, 8, 9, 10.

Water ht = 60.20 cm Temp °C
4 per 25.2°C

$t = 736.65$ sec = 1.7 f

1602 Water ht = 56.90 cm
System just critical
Drain: core = 391.0 - 130.8 - 1.7
= 258.50 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE RANGE	OFF	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	2"	✓	3×10^{-12}
"	"	Dist ✓	15"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Dist ✓	15"	✓	"
R-1					
R-2					
PA-1	700V	Alarm ✓	5"	✓	500V
PA-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG H CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by A.K.W.
 Instruments and safeties checked and reset by A.K.W.
 Source in checked by A.K.W. Source No. M-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuits: R-1-2 PM-1-2
 Red light on by A.K.W. Time 0810
 Start-up OK'd by F.P.C. A.K.W. Date 1-16-70

Conds 84-0 & 84-F

Repeat of last experiment described on p-79

Water ht = 60.20 cm
 + Per

Temp °C
 25.0°C

$\tau = 684.49 \text{ sec} = 1.8 \text{ h}$

0940 Water ht = 56.95 cm
 System just critical
 Chain.

done = $391.0 - 130.8 - 1.8$
 = -258.90 ✓

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP RANGE
K-1-2	2-1-0		" 2"		3X10 ⁻¹²
"	"		" 5"		"
"	"		" 2"		"
"	"		" 5"		"
"	"		" 2"		"
"	"		" 5"		"
"	"		" 5"		"
"	"		" 5"		"
"	"		" 5"		"
"	"		" 5"		"
"	"		" 5"		"

INSTRUMENT CHECK

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by A.K.V.

Instruments and safeties checked and reset by A.K.V.

Source is checked by A.K.V. Source No. M-43

Emergency equipment for control room checked by F.D.C.

Instruments in trip circuit: K-1-2 RM-1-2

LED light on by A.K.V. Time 12:25

Start-up OK'd by A.K.V. F.D.C. Date 1-21-70

H.F.I.R. Core 42-0 + 42-I

p. 77. Log Books
#3 core = 172, 42
9-19-68

Have cores 42-0 + 42-I, with spent fuel elements.
& fuel plates # 0-3224, 0-5495, 0-8242, 0-5495.
plus 6 enriched strips # 2, 3, 7, 8, 9, 10. 4 natural
strips # 2, 3, 4, 5. and 4 stainless steel strips.

Water ht = 60.40.
+ Per

Temp °C
25. °C

$\bar{c} = 149.94 \text{ cm} = 7.1 \text{ f}$

1345 Water ht = 53.80 cm
system just critical
Drain.

Core = 391.00 - 155.90 - 52.60 - 5.36 - 7.1
= -170.04 f

1405 Repeat of above:
Water ht = 60.30 cm
+ Per

Temp °C
25. °C

$\bar{c} = 160.80 \text{ cm} = 6.7 \text{ f}$

1422 Water ht = 53.90 cm
system just critical
Drain.

Core = 391.00 - 155.90 - 52.60 - 6.7 - 5.36
= -170.44 f

avg:

Have core 42-0 + 83-I, plus 9 spent fuel plates. #0-3224, 0-5495, 0-3292, 0-2870. plus 6 enriched strips #s 2,3,7,8,9,10. and 3 natural strips #s 2,3,4.

1517 Water ht = 60.20 cm Temp °C
 System sub-critical 25°C
 Drain.

Removed natural strip #2. Now have 9 fuel plates, 6 enriched strips & 2 natural strips.

1520 Water ht = 60.20 cm Temp °C
 System sub-critical 25°C
 Drain.

Removed natural strips #3 & 4. Now have 9 fuel plates and 6 enriched strips.

1550 Water ht = 60.90 cm Temp °C
 System very slightly sub-critical 25.2°C
 Drain.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3x10 ⁻¹²	Motor ✓	2"	✓	3x10 ⁻¹²
"	"	Foot ✓	1"	✓	"
K-2	"	Motor ✓	2"	✓	"
"	"	Foot ✓	1"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	✓	500V
PM-2	1200V	Alarm ✓	10"	✓	900V
"	"	Alarm ✓	1"	✓	"

LOS N CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL FLOOD LIGHT

START-UP CHECK LIST

Equipment checked by I.P.C. H.K.M. Personnel check by R.H.H.
 Instruments and safeties checked and reset by H.K.M.
 Source in checked by H.K.M. Source No. 19-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 IM-1-2
 Red light on by H.K.M. Time 0758
 Startup card by I.P.C. H.K.M. Date 1-22-70

H.F.I.R. Core 42-0 & 83-I.

Have core 42-0 & 83-I. plus 9 fuel plates
 #^s D-3224, D-5495, D-3242, D-2870. Plus 5
 enriched strips #^s 2, 3, 7, 9, 10, and 1 natural
 strip #2.

Water ht = 60.40 cm Temp °C
 + Pres 25°C

E = 80.40 sec = 11.7 f

0855 Water ht = 52.60 cm

System just critical
 Drain.

Core = 391.00 - 129.60 - 13.30 - 11.70
 = - 236.40 f

H.F.I.R. Core 83-0 & 42-I

Have core 83-0 & 42-I. plus 9 fuel plates #^s D-3224
 D-5495, D-3242, D-2870. Plus 5 enriched strips
 #^s 2, 3, 7, 9, 10, and 1 natural strip #2.

Water ht = 60.30 cm Temp °C
 + Pres 25°C

E = 82.57 sec = 11.4 f

1308 Water ht = 52.05 cm

System just critical
 Drain.

Core = 391.00 - 129.60 - 13.30 - 11.4
 = - 236.70

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	2"	✓	3X10 ⁻¹²
"	"	Fast ✓	1"	✓	"
K-2	"	Meter ✓	2"	✓	"
"	"	Fast ✓	1"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	1.5"	✓	500V
PM-2	1200V	Alarm ✓	10"	✓	900V
"	"	Alarm ✓	2"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80
 DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by I.D.C. [Signature] Personnel check by F.I.C.
 Instruments and safeties checked and reset by [Signature]
 Sources in checked by [Signature] Source No. 19-43
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuits: R-1-2 PM-1-2
 Red light on by [Signature] Time 0800
 Start-up OK'd by F.I.C. [Signature] Date 1-23-70

Have Core 84-0 + 42-1, plus spent fuel elements with 4 fuel plates. # 0-3224, 0-5495, 0-3242, 0-2870, 6 enriched strips # 2, 3, 7, 8, 9, 10, and 3 natural strips # 2, 3, 4.

0900 Water ht = 61.00 cm Temp °C
 System sub critical 24.8 °C
 Drain.

Removed natural strip # 2. Now have 4 fuel plates, 6 enriched strips # 2, 3, 7, 8, 9, 10 and 2 natural strips # 3, 4.

0914 Water ht = 60.20 cm Temp °C
 System sub critical 25.0 °C
 Drain.

Removed natural strip # 4. Have 4 fuel plates, 6 enriched strips # 2, 3, 7, 8, 9, 10, and 1 natural strip # 3.

Water ht = 60.30 cm
 + Per

Soil:

0935 Drain: Instrument trouble with log-N.

Repeat of last experiment 1-58 after checking Log-N.

Water ht = 60.20 cm Temp °C
 + Per 25.0 °C

$\epsilon = 95.61 \text{ sec} = 10.2 \text{ f}$
 1325 Water ht = 52.90 cm
 System just critical
 Drain. Core = 391.00 - 155.90 - 13.0 - 10.2
 = -211.90 f

H.F.I.R. Core 42-0 + 84-I

Have Core 42-0 + 84-I ensemble in small reflection tank, plus spent fuel elements with 4 fuel plates # 0-3224, 0-5495, 0-3242, 0-2870, 6 enriched strips # 2, 3, 7, 8, 9, 10, and 1 natural strip # 3.

Water ht = 60.20 cm Temp °C
 3 + Per 25 °C

$\epsilon = 199.92 \text{ sec} = 5.6 \text{ f}$
 1450 Water ht = 54.40 cm
 System just critical
 Drain. Core = 391.00 - 155.90 - 13.0 - 5.6
 = -216.50 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	3"	-	3×10^{-12}
"	"	F. P. ✓	1"	L	"
K-2	"	Meter ✓	3"	-	"
"	"	F. P. ✓	1"	-	"
R-1					
R-2					
PM 1	700V	Alarm ✓	15"	-	5000
PM 2	1200V	Low ✓	10"	-	9000
"	"	Alarm ✓	1"	-	"

LOS N CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL FROSE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. / A.K.M. Personnel check by F.P.C.

Instruments and safeties checked and reset by A.K.M.

Source in checked by A.K.M. Source No. M-93

Emergency equipment in control room checked by F.P.C.

Instruments in trip circuit: K-1-2 PM-1-2

Red light on by A.K.M. Time 1315

Start-up OK'd by F.P.C. / A.K.M. Date 6-30-70

"CE-2 Core"

Have CE-2 Core assemble in small reflector tank. Have first fuel element with 9 fuel plates #D-3229, D-5495, D-3292, D-2870. Plus 3 enriched plates #D-9, D-10, & natural strip #2.

Feed rate = 4.3 cm/min
 7/4" drain = 9.5 cm/min
 3" drain = 25.5 cm/min.

H₂O = 47.9 = top of outer fuel element.

Water ht = 59.40 cm
 + Per Temp °C = 25.9°

C = 119.51 cm = 8.6 f
 1512 Water ht = 51.90 cm
 System just critical
 Drain. Core = 391.0 - 422.0 - 5.0 = -290.2 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	Meter ✓	3"	-	3 X 10 ⁻¹²
"	"	Fast ✓	1"	-	"
K-2	"	Meter ✓	3"	-	"
"	"	Fast ✓	1"	-	"
R-1					
R-2					
PM-1	700V	Alarm ✓	15"	-	500V
PM-2	1200V	Low ✓	10"	-	900V
"	"	Alarm ✓	2"	-	"
LOG N. CALIBRATE		<input checked="" type="checkbox"/> OPERATE	SOURCE No. <u>B-80</u>		
DUMP WELL PROBE LIGHT <input type="checkbox"/>					

START-UP CHECK LIST

Equipment checked by F.P.C. / R.K.M. Personnel check by F.P.C.
 Instruments and safeties checked and reset by R.K.M.
 Source in checked by R.K.M. Source No. 14-93
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by R.K.M. Time 1320
 Start-up OK'd by F.P.C. / R.K.M. Date 7-1-70

H₂O = 48.9 cm
 = top of fuel
 plates in burner
 cone.

H.F.I.R. Cone
 87-0 + 87-1

Have cones 87-0 + 87-1 assemble in small reflector tank. Inner cone spaced .375" with plastic spacers.

1410 Water ht = 60.4 cm
 System just critical
 Drain.

Have cones 87-0 + 87-1, with spent fuel element with 4 fuel plates # D-3229
 D-5495, D-3242 D-2870. Plus 5 enriched strips # 2, 4, 8, 9, 10.

Water ht = 55.10 cm
 + Per

Temp °C
 25.5°C

T = 28.25 sec = 23.5¢
 1510 Water ht = 50.70 cm
 System just critical
 Drain.

[Faint handwritten notes]

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	3"	-	3X10 ⁻¹²
"	"	Fast -	"	-	"
K-2	"	Meter ✓	3"	-	"
"	"	Fast ✓	1"	-	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	-	500V
PM-2	1200V	Low ✓	10"	-	900V
"	"	Alarm -	2"	-	"

LOG N CALIBRATE OPERATE SOURCE No. 13-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by F.P.C. A.K.L. Personnel check by F.P.C.
 Instruments and safeties checked and reset by A.K.L.
 Source in checked by A.K.L. Source No. 19-93
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: X-1-2 PM-1-2
 Red light on by A.K.L. Time 0820
 Start-up OK'd by F.P.C. A.K.L. Date 7-2-70

added 1 natural strip #2. New base & fuel plates #0-3224, 0-5495, 0-3292, 0-2870. 5 enriched strip #2, 4, 8, 9, 10. and 1 natural strip #5. Total of 6 strips.

Water ht = 60.50 cm Temp °C
+ Per 25.5 °C

t = 76.05 cm = 12.2 f

0912 Water ht = 52.60 cm
System just critical
Drain.

Core = 391.0 - 144.1 - 12.2
= 234.70 f

Core 88-0 & 88-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

1028 Water ht = 60.20 cm
System sub critical
Drain.

aws:

Have cones 88-0 & 88-1, with spent fuel element with 4 fuel plates # D-3229, D-5495, D-3292, D-2870. Plus 6 enriched strips # 3, 5, 7, 8, 9, 10.

1112 Water ht = 60.30 cm
System sub critical
Drain.

Temp °C
25.7 °C

Removed enriched strip #5. Have 4 fuel plates D-3229, D-5495, D-3292, D-2870, plus 5 enriched strips # 3, 7, 8, 9, 10.

Water ht = 60.35 cm
+ Per

Temp °C
25.6 °C

$t = 49.99 \text{ sec} = 16.9 \text{ f} =$

1307 Water ht = 52.00 cm
System just critical
Drain.

Conc = $391.0 - \frac{130.3}{1} = 16.4$
= -244.30 f

Removed 2 fuel plates and the 5 enriched strips. Now have fuel plates # D-3229 and D-5495.

1342 Water ht = 60.20 cm
System just critical
Drain.

Temp °C
25.6 °C

Conc = -240.0 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1 2X10 -12		Meter ✓	3"	✓	3 X 10 ⁻¹²
"		Fast ✓	1"	✓	"
K-2 "		Meter ✓	3"	✓	"
"		Fast ✓	1"	✓	"
R-1					
PS 1 700V		Alarm ✓	5"	-	500V
PS 2 1200V		Low ✓	12"	✓	900V
"		Alarm ✓	2"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT _____

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by F.P.C.
 Instruments and safeties checked and reset by AKK
 Source in checked by AKK Source No. M-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKK Time 0900
 Start-up OK'd by F.P.C. AKK Date 7-6-70

H.F.I.R. Cores
87-0 + 87-1

Have Cores 87-0 + 87-1 with spent fuel element, 2 fuel plates # 0-3224, 0-5495.

Water ht = 60.20 cm Temp °C
+ Per 23.0 °C

E = 289.01 au = 4.0 f
 1004 Water ht = 55.60 cm
 System just critical
 Drain. Core = 290.0 - 4.0
 = 286.0 f

H.F.I.R. Cores
89-0 + 89-1

Have core 89-0 + 89-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

1103 Water ht = 60.30 cm Temp °C
System just critical 24.0 °C
Drain. See? by 7/10/70

over:

H.F.I.R. Cores
89-0 + 89-1

Have core 89-0 + 89-1, with spent fuel element with 4 fuel plates. #D-3229, D-5995, D-3242, D-2870. plus 5 enriched strips #2, 3, 4, 7, 8. and natural strip #5.

1329 Water ht = 60.20 cm; Temp °C
System just critical 24.2°C
Drain.

$$\begin{aligned} \text{Core} &= 391.00 - 142.20 \\ &= -248.80 \text{ f} \end{aligned}$$

Core 89-0 + 89-1
Removed 2 fuel plates. plus the 6 poison strips. Now have spent fuel element with 2 fuel plates #D-3229 + D-5995

Water ht = 60.20 cm Temp °C
2-per 29.5°C

$$C = -438.95 \text{ sec} = -3.2 \text{ f}$$

1410 Drain!

$$\begin{aligned} \text{Core} &= 290.0 + 3.2 \\ &= -243.20 \text{ f} \end{aligned}$$

H.F.I.R. Cores
92-0 + 92-1

Have Cores 92-0 + 92-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

1538 Water ht = 60.20 cm Temp °C
System sub critical 29.5°C
Drain.

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 X 10 ⁻¹²	Meter	3"	-	3 X 10 ⁻¹²
"	"	Fast	1"	-	"
K-2	"	Meter	3"	-	"
"	"	Fast	1"	-	"
R-1	"	Fast	1"	-	"
R-2	"	"	"	"	"
PM-1	700V	"	5"	-	500V
PM-2	1200V	"	12"	-	900V
"	"	"	8"	-	"

INSTRUMENT CHECK

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by AKM
 Source in checked by AKM Source No. 19-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKM Time 0820
 Start-up OK'd by F.D.C. AKM Date 7-7-70

Have core 92-0 & 92-1 with spent fuel element with 4 fuel plates # 0-3224, 0-5495, 0-3242, 0-2870. Plus 5 enriched strips # 2, 3, 4, 5, 6. and natural strip # 3.

0859 Water ht = 60.20 cm Temp °C
 System sub critical
 Drain. 24.2°C

Removed natural strip # 3.

0917 Water ht = 60.15 cm Temp °C
 System just critical
 Drain. 24.5°C

$$\text{Core} = 391.0 - 126.7 = 264.3$$

Removed 2 fuel plates and 5 enriched strips. Now have spent fuel element with 2 fuel plates # 0-3224 & 0-5495.

1305 Water ht = 60.20 cm Temp °C
 System sub critical
 Drain. 24.3°C

accy:

H.F.L.R. Cores.
91-0 + 91-1

Have Cores 91-0 + 91-1 assembled in small
reflector tank. Inner core spaced .375"
with plastic spacers.

1354 Water ht = 60.10 cm Temp °C
System sub critical 24.4 °C
Drain.

Now have spent fuel element with 2
fuel plates # D-3224 + D-5495.

Water ht = 60.30 cm
+ Per
T = 271.6 mW = 4.3 f
Water ht = 55.60 cm Temp °C
System just critical 24.6 °C
Drain.

$$\begin{aligned} \text{Core} &= 240.0 - 4.3 \\ &= -235.7 \text{ f} \end{aligned}$$

p. 105

Now have spent fuel element with 4 fuel
plates # D-3224, D-5495, D-3242, D-2870.
plus 5 enriched strips # 2, 4, 8, 9, 10. and
natural strip # 5.

Water ht = 60.20 cm. Temp °C
+ Per 25.0 °C

$$T = 210.78 \text{ mW} = 5.3 \text{ f}$$

1600 Water ht = 54.70 cm
System just critical
Drain.

$$\begin{aligned} \text{Core} &= 240.0 - \overset{1438}{130.8} = 5.3 - 13.0 \\ &= -241.90 \text{ f} \end{aligned}$$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	3"	✓	3×10^{-12}
"	"	Fest ✓	1"	✓	"
K-2	"	Meter ✓	3"	✓	"
"	"	Fest ✓	1"	✓	"
R-1					
R-2					
PM-1	700v	Alarm ✓	5"	✓	500v
PM-2	1200v	low ✓	12"	✓	900v
"	"	Alarm ✓	2"	✓	"
LOG N CALIBRATE <input checked="" type="checkbox"/>		OPERATE <input checked="" type="checkbox"/>		SOURCE No. <u>B-8a</u>	
DUMP WELL PROBE LIGHT <input type="checkbox"/>					

START-UP CHECK LIST

Equipment checked by F.D.C. AKM Personnel check by F.D.C.
 Instruments and safeties checked and reset by AKM
 Source in checked by AKM Source No. M-93
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKM Time 0809
 Start-up OK'd by F.D.C. AKM Date 7-8-70

H.F.I.R. Core 91-0 + 91-1

Repeat of last experiment, p 105.

Water ht = 60.20 cm Temp °C
 + Per Void 24.5 °C

0937 Drain: trouble with Leg n.

Repeat of above after checking Leg-n.

Water ht = 60.30 cm Temp °C
 + Per 24.6 °C

$T = 254.29 \mu\text{m} = 4.5 \phi$

1110 Water ht = 55.20 cm
 System just critical
 Drain:

Core = $391.0 - 130.8 - 13.6 = 9.5$
 $= 242.70 \mu\text{m}$

Repeat with 2 fuel plates, p 109.

Water ht = 60.20 cm Temp °C
 + Per

$T = 471.54 \mu\text{m} = 2.6 \phi$

1326 Water ht = 56.40 cm
 System just critical
 Drain:

Core = $240.0 - 2.6$
 $= 237.4 \phi$

Have cores 90-0 & 90-1 assemble in small reflector tank. Inner core spaced .375" with plastic spacers.

1434 Water ht = 60.25 cm
System sub critical
Drain.

Temp °
25.1 °

Now have spent fuel plate element with 2 fuel plates #0-3229, 0-3495.

Water ht = 60.20 cm
& per

Temp °
25.3 °

$\bar{v} = 278.14 \text{ m} = 4.2 \phi$

1520 Water ht = 55.60 cm
System just critical
Drain.

Core = 2290.0 4.2
= -235.80 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3X10 ⁻¹²	Meter ✓	3"	✓	3X10 ⁻¹²
"	"	Fst ✓	1"	✓	"
K-2	"	Meter ✓	3"	✓	"
"	"	Fst ✓	1"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	✓	900V
PM-2	1200V	Low ✓	12"	✓	900V
		Alarm ✓	2"	✓	"
LOG N CALIBRATE ✓			OPERATE ✓		SOURCE No. <u>B-80</u>
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by F.P.C. [Signature] Personnel check by F.P.C.
 Instruments and safeties checked and reset by [Signature]
 Source in checked by [Signature] Source No. 14-43
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: K-1-2 114-1-2
 Red light on by [Signature] Time 0805
 Start-up OK'd by F.P.C. [Signature] Date 7-9-70

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-7870 plus 5 enriched strips # 2, 3, 4, 5, 6, and natural strip # 2.

Water ht = 60.20 cm Temp °C
 1 + Per 25.2°

$t = 165.15 \text{ sec} = 6.6 \text{ f}$

0855 Water ht = 54.60 cm
 System just critical
 Drain. core = $391.0 - 140.0 = 6.6$
 $= -244.9 \text{ f}$

Repeat with 7 fuel plates p-108.

Water ht = 60.20 cm Temp °C
 2 + Per 25.1°

$t = 378.10 \text{ sec} = 3.2 \text{ f}$

1027 Water ht = 56.10 cm
 System just critical
 Drain. core = $240.0 - 3.2$
 $= -236.8 \text{ f}$

Now Cores 93-0 & ~~93-1~~ 93-1 assembled in small reflector tank. Power core spaced .375" with plastic spacers.

1300 Water ht = 60.20 cm
 System sub critical
 Drain.

Now spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-7870, plus 5 enriched strips # 1, 7, 8, 9, 10, and natural strip # 3

1350 Water ht = 60.30 cm Temp °C
 System sub critical 25.5°
 Drain.

Removed natural strip # 3.

Water ht = 60.20 cm Temp °C
 3 + Per 25.5°

$t = 152.11 \text{ sec} = 7.0 \text{ f}$

1417 Water ht = 54.10 cm
 System just critical
 Drain. core = $391.0 - 130.10 = 7.0$
 $= -253.9 \text{ f}$
 over:

Have spent fuel element with 2
fuel plates #0-3229 + 0-3495.

1526 Water ht = 60.30 cm
System sub critical
Drain.

Temp $^{\circ}$
25.6 $^{\circ}$

12/2/70

Small plumbing system assembled in 101-201
with upper tank from South (approx 36" diam
x 50" high, All. (See Activity Log p. 3-4).

Feed rate: 4.2 cm³/min
3/4" drain rate: 11.4 cm³/min
3" dump rate: 28.6 cm³/10 sec = 171.6 cm³/min

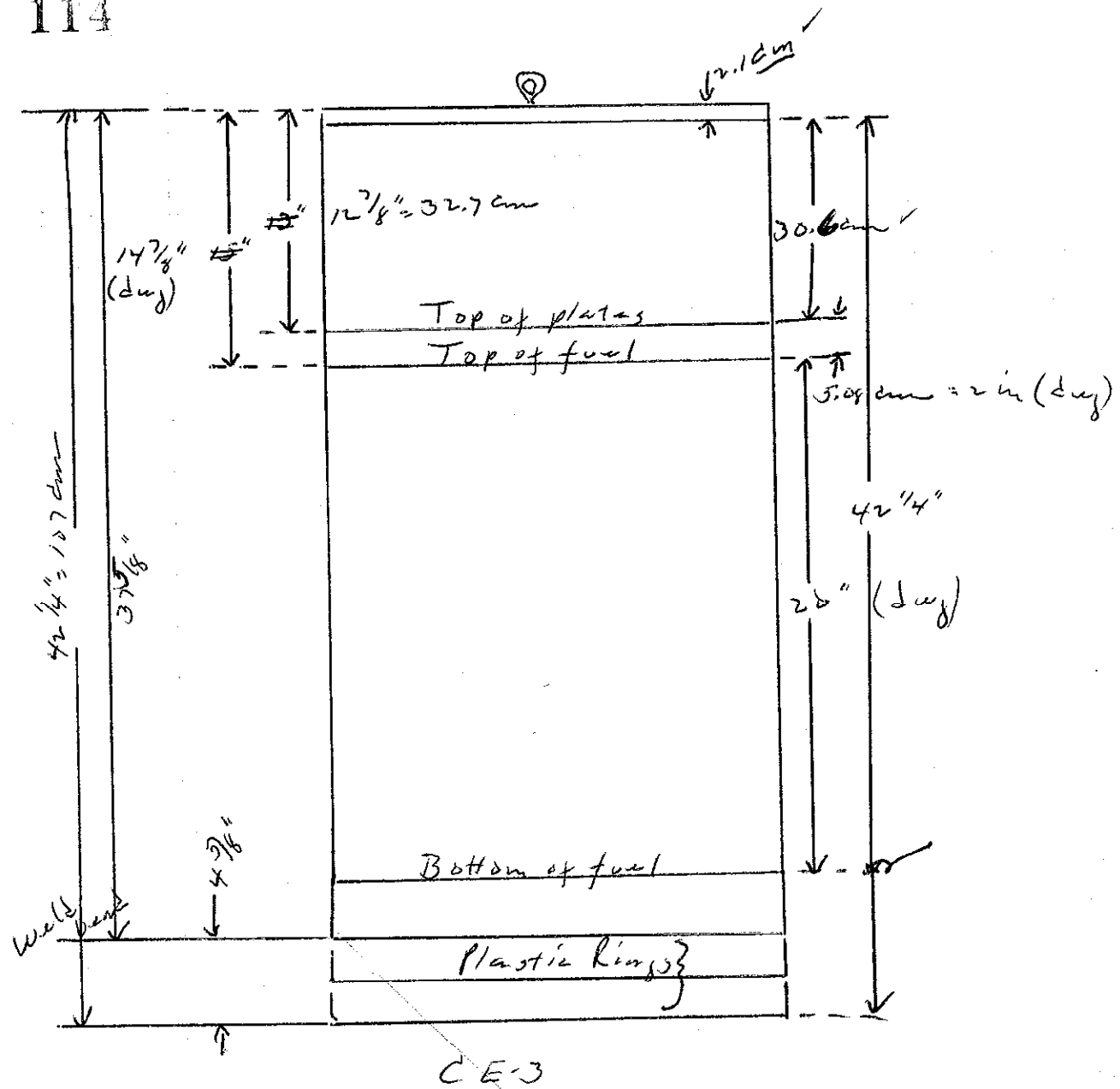
12/10/70

Found more contamination. After work
outlined in Activity Log, replaced water and
redetermined and set feed rate.

Feed valve (manual) open 2 turns
Bypass open 1.75 turns.

Feed rate: 4.3 cm³/min See p. 119 at
3/4" drain: 5.1 cm³/min See
3" dump: 27.1 cm³/10 sec = 162.6 cm³/min

Installed instruments on outside of tank
with sensitive region \approx E of fuel region.
K-1 north, K-2 west, Lg N South
Source east.



Element is built and will be run with the removable fuel plates installed as in the delivered element.

12/10/70

START-UP PROCEDURE

INSTRUMENT	RANGE	TRIP	TRIP	START-UP RANGE
K-1	3 x 10 ⁻¹²	100 V	3"	3 x 10 ⁻¹²
		✓	1"	"
K-2	3 x 10 ⁻¹²	100 V	3"	"
		✓	3"	"
PM-1	—			
PM-2	—			
PM-1	700 V	Alarm	1/2"	500 V
PM-2	1200 V	Alarm	1/4"	900 V
		Alarm	2"	"
LOG IN CALIBRATE		✓	SOURCE No. B-80	
DUMP WELL PROBE LIGHT		—		

START-UP CHECK LIST

Equipment checked by EJ IDC Recurrent check by IDC

Instruments and safeties checked and reset by EJ

Source in checked by EJ Source No. M-43

Emergency equipment in control room checked by IDC

Instruments in trip circuit: K-1, K-2, PM-1, PM-2

Red Light on by EJ Date 12/10/70

Start-up OK'd by EJ IDC Date 12/10/70

1643 Water @ 49.7 cm. Slightly supercritical.

Measurements after partial drain #15 22.0°C

1705 Dump #16 22.1°C

12/12/70

A measurement ~~to~~ from the top outside of the element to water at one level indicated that the physical measurement of 43.2 cm to the water corresponded to a manual reading of 36.1 cm.

12/11/70

Installed enriched strips 1, 2, 3, 4, 5, 6 in outer annulus of element. Closed manual valve on fuel $\approx 1/4$ turn. Installed mirror over tank. Moved stop on source drive rod to allow source below top of fuel.

EJ

12/11/70

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START UP RANGE
K-1	3x10 ⁻¹²	Meter ✓	3"	✓	3x10 ⁻¹²
		Test ✓	3"	✓	
K-2	3x10 ⁻¹²	Meter ✓	3"	✓	3x10 ⁻¹²
		Test ✓	3"	✓	
R-1	—				
R-2	—				
PM-1	7000	Alarm ✓	1/2"	✓	5000
PM-2	12000	Low ✓	18"	✓	9000
		Alarm ✓	1"	✓	
LOG N CALIBRATE ✓		OPERATE ✓	SOURCE No. B-80		
DUMP WELL PROBE LIGHT —					

START-UP CHECK LIST

Equipment checked by EJ IDC Personnel check by IDC
 Instruments and safeties checked and reset by EJ
 Source is checked by _____ Source No. N-43
 Emergency equipment in control room checked by IDC
 Instruments in trip circuit: K-1, K-2, PM-1, PM-2
 Red light on by EJ Time 12:00
 Start-up OK'd by EJ IDC Date 12/11/70

CE-3 in tank (small) in vol. Situation described on p. 117. Present purpose: to correlate

12/11/70

monometer readings with water brought in element.

Feed rate: 4.6 cm/min.

1320 Water at 49.0 at top of plates (control room observation)

1357 Water @ 58.8 cm. Subcritical

Removed much steam from inside water of element. Will start blotter paper for analysis.

Drain partially and reflood. More cond. Attempted to vacuum surface of water inside element and top of plates with water pump. Could not replace water removed from storage tank by using system pump to fill from barrel. Plug on feed valve pulled to keep that valve closed during filling of storage tank.

1415 Dumped.

REQUISITION

684618

REQUISITION

684617

Bio

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REPORT TO

C. Cross

BUILDING NO.

9213

PHONE NO.

35237

REPORT TO

C. Cross

BUILDING NO.

9213

PHONE NO.

35237

00000002	g U/g
	g Ag/g
	g D/g
	g H/g
	g Mo/g
	g F/g
	SPEC.
	ASSAY

000000045	g U/g
	g Ag/g
	g D/g
	g H/g
	g Mo/g
	g F/g
	SPEC.
	ASSAY

NO	REPT. BY
12-10-70	DATE
F	DEPT.

NO	REPT. BY
12-10-70	DATE
F	DEPT.

12/14/70

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START UP RANGE
K-1	3x10 ⁻¹²	Meter ✓	3"	✓	3x10 ⁻¹²
		Fast ✓	1"	✓	
K-2	3x10 ⁻¹²	Meter ✓	3"	✓	3x10 ⁻¹²
		Fast ✓	3"	✓	
R-1	—				
R-2	—				
PM-1	7000	Alarm ✓	1/2"	✓	5000
PM-2	12000	Low ✓	14"	✓	9000
		Alarm ✓	1"	✓	
LOG N CALIBRATE		✓	OPERATE	✓	SOURCE No. B-80
DUMP VOLT PROBE LIGHT		—			

START-UP CHECK LIST

Equipment checked by EJ IDC Personnel check by IDC
 Instruments and safeties checked and reset by EJ
 Sources in checked by EJ Source No. M 43
 Emergency equipment in control room checked by IDC
 Instruments in trip circuit: K-1, K-2, PM-1, PM-2
 Red light on by EJ 10:00
 Start-up OK'd by EJ IDC Date 12/14/70

12/14/70

Threads on "fill line" galled. Repaired.
 About 10:00 AM hold tank to replace float
 pumped out 12/14/70 in attempting to remove
 cond. Reset fuses and bypass manual
 valves as exp. 113.

1045 Water @ 61 cm. No evidence of cond.

1055 Water @ 49.8 cm - top of plates - observation
 at tank (Measurement not level)

1100 Water @ 49.0 cm - top of plates from
 control room observation

Drain (3/4" line) = 11.0 cm/min

Dump rate: 26.4 cm/10 sec = 158.4 cm/min

Flood rate: 4.7 cm/min

11:15 Dump.

Removed B-55 strips leaving #5 + #6. Installed
 #5 Natural strip. Total worth (calibrated) 60.6¢
 However, actual worth unknown because no
 combs to guide and bottom of fuel plates
 not visible.

17/14/70

1345 Water at 64.3 cm. Sufficient.
 (This is all available water from storage)
 #15 24.5°C
 #16 24.5°C

1350 Dump

Remove lateral strip #5. Remaining strips
 work = 47.6 cm

1430 Water @ 57.4 cm. T = 24.5°C

1440 Same as ant. Noticed air bubbles from outer
 annulus. Difficult to level.

1455 Water at 56.8 cm. Approximately critical.

Dump to below top of fuel plates.
 Pump trouble no. repeat dump - fill several times.
 No more evidence of bubbles.

1545 Water @ 62.7 cm. Sufficient. T = 24.7°C

1555 Water @ 56.3 cm. Approx. critical. (K on 3x10¹¹)
 Added a tad. 56.5 cm. Better level.

1600 Dump

17/15/70

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	TRIP	SET	START-UP RANGE
K-1	3x10 ¹¹	None	✓	3"	✓ 3x10 ¹¹
K-2		Set	✓	3"	✓
M-1	3x10 ¹¹	None	✓	3"	✓ 3x10 ¹¹
M-2		Set	✓	3"	✓
P-1					
P-2					
P-3	7000	Alarm	✓	1/2"	✓ 5000
P-4	12000	Set	✓	14"	✓ 5000
		Alarm	✓	1"	✓
PUMP OPERATE		✓	OPERATE	✓	SOURCE No. B-82
DUMP WILL PROBE LIGHT <u> </u>					

INSTRUMENT CHECK LIST

General checked by EJ FDC Personnel check by FDC
 Instruments and cables checked and reset by EJ
 Source in checked by EJ Source No. B-43
 Emergency equipment in control room checked by FDC
 Instruments in trip circuit: K-1, K-2, M-1, M-2
 Trip light on by EJ Time 10:01
 Fueling OK'd by EJ FDC Date 17/15/70

1715770

Added 4 enriched strips, A out in numbers.
Air check

Total

10:30

Subcritical submerged. Janned system by
dump valve several times. A few fine bubbles
knocked loose. Pumped back up & repeated. No
bubbles. Closed bypass valve $\frac{1}{4}$ turn
because of shower of bubbles when ~~the~~ fuel
valve opened.

11:20

Dump

Removed all strips except #5 & 6 enriched,
worth 47.6 cents total. Repeat of p. 122.
These strips have not been moved since
original installation.

T = 24.7°C

1445

Water @ 59.8 cm. ^{-0.4¢} Supercritical - slightly.
+ 4.7 cents from HFIR cover

1500

Source removed.

1515

Water @ 56.0 cm. Critical ^{+0.4¢}
Element worth 4.7 + 47.6 = 52.3 cents, 52.7¢
Removed enriched strips 5 & 6, added
enriched strip #1 & natural strip #5. Total
worth 40.2 cents.

1715770

2.8¢

1547

Water @ 57.1 cm + Point #1
T = 54.1 gm P = 15.5¢

1555

Water @ 52.5 cm. Critical T = 24.7°C

Element worth: 15.5 + 40.2 = 55.7¢ + 2.8 = 58.5¢
Dump.

12/16/70

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3x15 ⁻¹²	Meter ✓	3"	✓	3x15 ⁻¹²
		Est ✓	3"	✓	
K-2	3x15 ⁻¹²	Meter ✓	3"	✓	3x15 ⁻¹²
		Est ✓	3"	✓	
R-1	—				
R-2	—				
PM-1	5000	Alarm ✓	14"	✓	5000
PM-2	12000	Low ✓	14"	✓	5000
		Alarm ✓	1"	✓	

LOG N CALIBRATE OPERATE SOURCE No. B-8d
 DUMP WELL PROSE LIGHT

START-UP CHECK LIST

Equipment checked by IDC Personnel check by IDC
 Instruments and safeties checked and reset by EF
 Source in checked by EF Source No. 1743
 Emergency equipment in control room checked by EF IDC
 Instruments in trip circuit: K-1, K-2, PM-1, PM-2
 Red light on by EF Time 12/16/70 5:30
 Start-up OK'd by EF IDC Date 12/16/70

12/14/70

Enriched strip #1 & natural strip #5 removed and replaced ^{IDC} elsewhere in the outer annulus.

1010 Water @ 55.8 cm. ^{5.14} Period #1 T=24.5°C

T=64.2 sec; p=13.8 cents

1020 Water @ 52.3 cm. Critical.
 5.1 + 13.8 + 40.2 = 59.1 cents

1025 Dump. 15.8 + 40.2 = 56.0 cents

Removed and replaced ⁵⁰ flame strips.

1355 Water @ 55.8 cm. ^{5.14} Period #2 T=24.7°C
 T=54.8 sec; p=15.4 cents

1405 Water @ 52.2 cm. Critical
 5.1 + 15.4 + 40.2 = 60.7 cents

Dump. 10.5 + 40.2 = 50.7 cents

Installed Cd-prison post, removed strips.

1550 Water at 64.6 cm. Very subcritical.

1555 Dump

12/17/70 Removed element from tank, with prison post and strips that had come in it reinstalled. Smeared. (over)

12/17/70

Took water sample. Distilled to South.
 Also confirmed measurements indicated
 on p. 114.
 # 684620 = 0.001 $\mu\text{g/g}$ ppm

1-18-71 Sample taken from small reflector
 tank (H.F.I.R.).
 Reg # 684622. = 0.001 ppm.
 out for g/g .

Feed rate = 5.0 cm/min.
 3/4" drain rate = 10.2 cm/min.
 3.0" drain rate = 33.5 cm/10 sec

Top of fuel plates in center element = 47.1 cm
 " " " " inner " = 47.9 cm
 6" Top reflector = 59.0 cm.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter <input checked="" type="checkbox"/>	1"	<input checked="" type="checkbox"/>	3×10^{-12}
"	"	Fest <input checked="" type="checkbox"/>	2"	<input checked="" type="checkbox"/>	"
K-2	"	Meter <input checked="" type="checkbox"/>	2"	<input checked="" type="checkbox"/>	"
"	"	Fest <input checked="" type="checkbox"/>	3"	<input checked="" type="checkbox"/>	"
R-1					
R-2					
PM-1	700V	Alarm <input checked="" type="checkbox"/>	5"	<input checked="" type="checkbox"/>	500V
PM-2	1200V	Low <input checked="" type="checkbox"/>	18"	<input checked="" type="checkbox"/>	900V
		Alarm <input checked="" type="checkbox"/>	2"	<input checked="" type="checkbox"/>	"
LOG <input checked="" type="checkbox"/> CALIBRATE <input checked="" type="checkbox"/> OPERATE <input checked="" type="checkbox"/>			SOURCE No. B-80		
DUMP WELL PROBE LIGHT <input type="checkbox"/>					

START-UP CHECK LIST

Equipment checked by D.D.C. Personnel check by Fid.c
 Instruments and safeties checked and reset by A.K.L.
 Sources to be checked by A.K.L. Source No. 14-93
 Emergency equipment in control room checked by Fid.c
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.K.L. Time 14:15
 Start-up OK'd by Fid.c. A.K.L. Date 1-18-71

REQUISITION

684622

71 JAN 18 PM 3:37

REPORT TO

A. K. Reddy

BUILDING NO.

9213

PHONE NO.

3-5237

000000000/										g U/g
										g Ay/g
										g D/g
										g H/g
										g Mo/g
										g F/g
										SPEC.
										ASSAY

J.M.		REPT. BY
1-19-71		DATE
		DEPT.

F.

H.F.L.R. Cores 94-0 + 94-1

Have H.F.L.R. Cores 94-0 + 94-1 assembled in small reflector tanks. From core spaced .375" with plastic spacers.

1520 Water hgt = 59.0 cm
System sub critical
Green

H₂O Temp °C
15 = 23.6°C
16 = 24.0°C

INSTRUMENT CHECK

INSTRUMENT	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1 3A10-12	Water ✓	3"	✓	3A10-12
"	Fast ✓	"	✓	"
K-2 "	Meter ✓	2"	✓	"
"	Fast ✓	"	✓	"
R-1				
R-2				
PM1 700V	Alarm ✓	5"	-	500V
PM2 1200V	Low ✓	18"	✓	900V
"	Alarm ✓	2"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by ^{F.I.C.} AKM Personnel check by AKM
 Instruments and safeties checked and reset by AKM
 Source in checked by AKM Source No. M-93
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKM Time 0825
 Start-up OK'd by F.I.C. AKM Date 1-19-71

Now have spent fuel element with 2 fuel plates # 0-3224, & 0-5495.

0920 Water ht = 59.0 cm H₂O Temp °C
 System sub critical 15 = 23.7°
 Drain 16 = 24.0°

Now have spent fuel element with 4 fuel plates # 0-3224, 0-5495, 0-3242, 0-2870, plus 5 enriched strips # 2, 3, 4, 5, 6 and 1 natural strip # 2.

1010 Water ht = 59.40 cm H₂O Temp °C
 1-Per 15 = 24.°
 $\tau = -317.25 \text{ sec} = -4.7 \text{ f}$ 16 = 24.°
 Drain to ~ 34.0 cm and removed natural strip # 2.

Water ht = 59.00 cm H₂O Temp °C
 2-Per 15 = 24°
 $\tau = 162.97 \text{ sec} = 6.6 \text{ f}$ 16 = 24.2°

1041 Water ht = 53.20 cm
 System just critical
 Drain. core = 391.0 - 6.6 - 126.704
= 257.74 ✓

Now core 95-0 & 95-1 assemble in small reflection tank. Inner core spaced .375" with plastic spacers.

1351 Water ht = 59.40 cm H₂O Temp °C
 System sub critical 15 = 24.2°
 Drain 16 = 24.2°

Now have spent fuel element with 2 fuel plates # 0-3224 & 0-5495.

1428 Water ht = 59.40 cm H₂O Temp °C
 System sub critical 15 = 24.2°
 Drain 16 = 24.6°

Now have spent fuel element with 4 fuel plates # 0-3224, 0-5495, 0-3242, 0-2870, plus 5 enriched strips # 2, 3, 4, 5, 6.

Water ht = 59.10 cm H₂O Temp °C
 3-Per 15 = 24.2°
 $\tau = 380.72 \text{ sec} = 3.3 \text{ f}$ 16 = 24.2°

1537 Water ht = 54.50 cm
 System just critical
 Drain. core = 391.0 - 126.704 - 3.34
= 261.0 ✓

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP RANGE
K-1	3x10 ⁻¹²	Meter ✓	2"	-	3x10 ⁻¹²
"	"	Fast ✓	2"	-	"
K-2	"	Meter ✓	2"	-	"
"	"	Fast ✓	2"	-	"
R-1					
R-2					
PM-1	700V	Alarm ✓	5"	-	500V
PM-2	1200V	Fast ✓	18"	-	900V
"	"	Alarm ✓	2"	-	"
LOG N CALIBRATE ✓		OPERATE ✓		SOURCE No. B-80	
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by F.P.C. Personnel check by F.P.C.
 Instruments and safeties checked and reset by ARKA
 Source in checked by ARKA Source No. M-93
 Emergency equipment in control room checked by F.P.C.
 Instruments in trip circuit: A-1-2 PM-1-2
 Red light on by ARKA Time 0950
 Start-up OK'd by F.P.C., ARKA Date 1-20-71

H.F.I.R. Cons 96-0 + 96-K

Have cons 96-0 + 96-1 assemble in small reflector tank. driver some speed, 375" with plastic specimen

1025 Water ht = 59.10 cm
 System not critical
 Drain.

Temp °C
 15 = 24.0°C
 16 = 24.2°C

Now have spent fuel element with 2 fuel plates #D-3224 & D-5485.

Water ht = 59.10 cm
 1-Per
 N.G.

Temp °C
 15 = 24.2°C
 16 = 24.5°C

1115 Drain:

Now have spent fuel element with 4 fuel plates #D-3224 + D-5485, D-3242, D-2870, plus 5 enriched strips #5, 3, 4, 5, 6, 7.

Water ht = 59.00 cm
 2+Per
 C = 73.88 sec = 12.4¢

Temp °C
 15 = 24.5°C
 16 = 24.7°C

1339 Water ht = 51.60 cm.
 System just critical
 Drain.

con = 391.0 - 124.9 - 12.4
 = 253.7¢ ✓

H.F.I.R. Cores 97-0 + 97-1

New cores 97-0 + 97-1 assembly in small reflector tank. Inner core spaced .375" with plastic ~~spacers~~ spacers.

1515 Water ht = 59.00 cm Temp °C
 System sub critical 15 = 29.5 °C
 Drain 16 = 29.7 °C

Now have spent fuel element, with 2 fuel plates FD-3229 + D-5495.

1541 Water ht = 59.10 cm Temp °C
 System sub critical 15 = 29.6 °C
 Drain 16 = 29.6 °C

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	5"	✓	3×10^{-12}
"	"	Fast ✓	4"	✓	"
K-2	"	Meter ✓	5"	✓	"
"	"	Fast ✓	4"	✓	"
R-1					
R-2					
PM-1	700V	Alarm ✓	1"	✓	500V
PM-2	1200V	Low ✓	14"	✓	900V
"	"	Alarm ✓	1"	✓	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

F.I.C.
 Equipment checked by AKM Personnel check by F.I.C.
 Instruments and safeties checked and reset by AKM
 Source in checked by AKM Source No. M-93
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by AKM Time 0845
 Start-up OK'd by F.I.C. AKM Date 1-21-71

H.F.I.R. Core 97-0 + 97-1

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870, plus 5 enriched strips # 3, 4, 5, 6, 7.

0924 Water ht = 59.20 cm Temp °C
System just critical
Drain.
15 = 24.2°C
16 = 24.3°C
Core = 391.0 - 124.9 = 266.1 f

H.F.I.R. Core 98-0 + 98-1

Now H.F.I.R. core 98-0 + 98-1 available in small reflector tank. Inner core spaced 375" with plastic spacers.

1050 Water ht = 59.10 cm Temp °C
System sub critical
Drain.
15 = 24.2°C
16 = 24.3°C

Now have spent fuel element with 2 fuel plates # D-3224 + D-5495.

1307 Water ht = 59.10 cm Temp °C
System sub critical
Drain.
15 = 24.5°C
16 = 24.6°C

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870, plus 5 enriched strips # 3, 4, 5, 6, 7.

Water ht = 59.20 cm Temp °C
+ Res
15 = 24.5°C
16 = 24.7°C
C = 115.17 sec = 8.8 f

1404 Water ht = 52.60 cm
System just critical
Drain.
Core = 391.0 - 124.9 - 8.8 f = 257.3 f

H.F.I.R. Core 99-0 + 99-1

Now H.F.I.R. core 99-0 + 99-1 available in small reflector tank. Inner core spaced 375" with plastic spacers.

1450 Water ht = 59.10 cm Temp °C
System sub critical
Drain.
15 = 25.6
16 = 25.6

Now have spent fuel element with 2 fuel plates # D-3224, D-5495.

Water ht = 59.10 cm;
+ Res
C = 371.58 sec = 3.2 f
over!

H.F.I.R. Core 99-0-89-1

1550 Water ht = 54.90 cm Temp °C
 System just critical
 Drain.
 15 = 24.7
 16 = 25.0
 $com = 290.0 - 3.24$
 $= 286.8 \phi$

DUMP WELL FIBRE LIGHT

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	START-UP RANGE
K1 3X10	12	✓	4"	3X10-12
K2	"	✓	4"	"
K3	"	✓	4"	"
R1	"	✓	2"	"
R2	"	✓	2"	"
PM1 700V	"	✓	18"	500V
PM2 1200V	"	✓	18"	900V
LOG IN CHANNELS				
SOURCE NO.				B-80

INSTRUMENT CHECK

START-UP CHECK LIST

Equipment checked by FID.C Personnel check by FID.C
 Instruments and safeties checked and reset by AKW
 Sources in checked by AKW Source No. M-93
 Emergency equipment in control room checked by FID.C
 Instruments in trip circuit: K-1-L PM-1-2
 Red light on by AKW Time 0810
 Start-up OK'd by FID.C AKW Date 1-22-71

H.F.I.R. Core 99-0-89-1

Repeat of last experiment:

Water ht = 59.60 cm; Temp °C
 + Per 15 = 24.2 °C
 16 = 24.5 °C
 $\tau = 912.66 \text{ sec} = 1.9 \phi$
 Water ht = 56.40 cm
 System just critical
 Drain. $com = 290.0 - 1.4 \phi$
 $= 288.6 \phi$

New have spent fuel element with 4 fuel plates
 FS D-3224, D-5495, D-3242, D-2870, plus 5 enriched
 strips # 3, 7, 8, 9, 10, and natural strip # 3.

Water ht = 59.10 cm; Temp °C
 24 Per 15 = 24.2 °C
 16 = 24.5 °C
 $\tau = 280.32 \text{ sec} = 4.1 \phi$
 Water ht = 54.00 cm
 System just critical
 Drain $com = 391.0 - 143.3 - 4.1$
 $= 243.6 \phi$

New H.F.V.R. Cones 100-0 + 100-F assemble
in small reflector tanks, cones were
spaced 3.75" with plastic spacers

1432 Water ht = 59.10cm
System sub critical
Drain

Temp °C
15 = 24.5 °C
16 = 25.0 °C

Now have spent fuel element with 2 fuel
plates # D-3229 + D-5495

Water ht = 59.00 cm
3-Per
E = 386.81mc = 4.94

Temp °C
15 = 24.5 °C
16 = 25.0 °C

1520 Drain

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE REFERENCE	SET	START-UP RANGE
K-1	3 x 10 ⁻¹²	Meter ✓	3"	-	3 x 10 ⁻¹²
"	"	Fast ✓	1"	-	"
K-2	"	Meter ✓	3"	-	"
"	"	Fast ✓	3"	-	"
R-1					
R-2					
PM-1	700V	Alarm ✓	1.0"	-	500V
PM-2	1200V	Low ✓	12"	-	900V
		Alarm ✓	1"	-	"

LOG IN CALIBRATE OPERATE SOURCE No. B-80

DUMP WELL FROZE LIGHT

START-UP CHECK LIST

Equipment checked by F.I.C. Personnel check by F.I.C.
 Instruments and safeties checked and reset by A.R.D.
 Source in checked by A.R.D. Source No. M-43
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuit: K-1-2 PM-1-2
 Red light on by A.R.D. Time 0815
 Start-up OK'd by F.I.C. A.R.D. Date 1-25-71

Repeat of heat run. see p-142.

Water ht = 59.50 cm

Temp °C

1 Per

15 = 23.5 °C

t = -217.30 m = -7.8 f

10 = 23.7 °C

0851 Drain

now have spent fuel element with 4 fuel plates # 0-3224, 0-5495, 0-3242, 0-2870. Plus 5 enriched strips # 2, 3, 5, 6, 8

Water ht = 59.20 cm

Temp °C

2 Per

15 = 23.7 °C

t = 112.99 m = 9.0 f

10 = 24.0 °C

1055 Water ht = 52.40 cm

system just critical

Drain

core = 391.0 - 126.8 - 9.0

= 255.1 f

1330 Have H.F.I.R. core 101-0 & 101-I assembled in small reflector tank, tubes are spaced .375" with plastic spacers.

Water ht = 59.10 cm

Temp °C

system sub critical

15 = 23.6 °C

Drain

10 = 24.0 °C

now have spent fuel element with 2 fuel plates # 0-3224 & 0-5495.

Water ht = 59.10 cm

Temp °C

3 Per

15 = 24.5 °C

t = 532.38 m = 2.8 f

10 = 24.7 °C

1421. Water ht = 56.40 cm

system just critical

Drain

core = 240.0 - 2.3

= 237.7 f

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	STARTUP RANGE
K-1	3K10-12	✓	3"	✓	3K10-12
"	"	✓	1"	✓	"
K-2	"	Water ✓	3"	-	"
"	"	Test ✓	1"	✓	"
R-1					
R-2					
PM-1	700 ✓	Alarm ✓	10"	-	500 ✓
PM-2	1200 ✓	Low ✓	12"	-	900 ✓
		Alarm ✓	1"	-	"
LOG N CALIBRATE		✓	OPERATE		✓
DUMP WELL PROBE LIGHT		✓	SOURCE No.		13-80

START-UP CHECK LIST

Equipment checked by T.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by A.M.L.
 Source in checked by A.M.L. Source No. M-93
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: TK-1-2 IM-1-2
 Red light on by A.M.L. Time 0810
 Start-up CK'd by F.D.C., A.M.L. Date 1-26-71

C.E-2 Core

Have C.E-2 core assembly in small reflector tank. Have spent fuel element with 4 fuel plates #1-3228, 1-5495, 1-3242, 1-2870. Also 3 irradiated strips #4, 8, 10, and Natural strip #7.

H₂O = 46.85 cm = top of fuel plates

Water ht = 59.10 cm Temp °C
 15 = 28.0 °C
 10 = 24.2 °C

0905 ~~Water~~ Water ht = 50.10 cm
 System just critical
 Drain. Core = 391.0 = 92.20 - 12A
 = -286.40

7-29-71 Feed rate = 4.6 cm/min
 3/4" Drain rate = 10.0 cm/min
 3" Drain rate = 31.4 cm/10 sec.

H₂O ≈ 47.1 cm = top of ~~outer~~ ^{settles} element
 " = 48.0 cm = top of inner element.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3x10 ⁻¹²	Meter ✓	4'	✓	3x10 ⁻¹²
"	"	Fast ✓	1'	✓	"
K-2		Meter			
		Fast			
R-1					
R-2					
PM-1	700 ✓	Alarm ✓	cont	✓	500 ✓
PM-2	1200 ✓	Low ✓	10"	✓	900 ✓
"	"	Alarm ✓	1"	✓	"
LOG IN CALIBRATE		✓	OPERATE	✓	SOURCE No. B-90
DUMP WELL PROBE LIGHT					

START-UP CHECK LIST

Equipment checked by F.D.C. Personnel check by F.D.C.
~~AKA~~
 Instruments and safeties checked and reset by AKA
 Source is checked by AKA Source No. M-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by AKA Time 14-15
 Start-up OK'd by F.D.C., AKA Date 7-29-71

H.F.I.R. Core 102-0 & 102-1

Have H.F.I.R. Core 102-0 & 102-1 assembly in small reflection tank. Inner core spaced 1.775" with plastic spacers.

1415 Water hts = 59.10 cm
System sub critical
Drain.

Now have spent fuel element with 2 fuel plates #^s D-3224 + D-5495.

Water hts = 59.10 cm
+ Per
C = 102.3 cm = 9.6 φ 4.8

Temp °C
#15 = 22.5
16 = 22.5

1542 Water hts = 52.20 cm
System just critical
Drain.

cm = 240.0 - 9.6
= 230.4 φ ✓

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DIST. RANGE	SET	START-UP RANGE
K-1	3x10 ⁻¹²	Meter -	3"	-	3x10 ⁻¹²
"	"	Ext -	1"	-	"
K-2		Meter			
		Ext			
R-1					
R-2					
PM-1	7000	Alarm -	1"	-	5000
PM-2	12000	Low -	12"	-	9000
"	"	Alarm ✓	1"	-	"
LOG N CALIBRATE -			OPERATE -		SOURCE No. B-80
DUMP WELL PROBE LIGHT -					

START-UP CHECK LIST

Equipment checked by c.e. B.K.M. Personnel check by B.K.M.
 Instruments and safeties checked and reset by B.K.M.
 Source in checked by B.K.M. Source No. M-23
 Emergency equipment in control room checked by B.K.M.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by B.K.M. Time 0855
 Start-up OK'd by c.e. B.K.M. Date 7-30-71

Have H.F.I.R. core 103-0 & 103-1 assembly in small reflector tank. inner core spaced .375" with plastic spacers.

0935 Water ht = 59.10 cm
System sub critical
Drain.

Now have spent fuel element with 2 fuel plates #D-3224 & D-5495.

1005 Water ht = 49.50 cm
System just critical
Drain.

Now have spent fuel elements with 4 fuel plates #D-3224 & D-5495, D-3242, D-2870, plus 6 enriched strips #5, 7, 3, 5, 6, 8, 10. = 153.4

Water ht = 59.10 cm
' + Per

t = 41.3 sec = 18.6 f

1243 Water ht = 50.40 cm

System just critical

Drain, core = 391.0 - 1534 - 18.6 = 219.0 f

Temp °C

#15 = 22.7°C

16 = 23.0°C

Have H.F.I.R. core 104-0 & 104-1 assembly in small reflector tank. inner core spaced .375" with plastic spacers.

1400 Water ht = 59.20 cm
System sub critical
Drain.

Now have spent fuel element with 2 fuel plates #D-3224 & D-5495.

Water ht = 59.10 cm ^{dh = 7.1 cm}
' + Per

t = 80.40 sec = 11.7 f = 16.4 cm

1515 Water ht = 52.00 cm

System just critical
Drain.

core = 220 - 11.7 = 228.3 f

Temp °C

#15 = 23.0°C

16 = 23.5°C

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter ✓	9"	✓	3×10^{-12}
"	"	" ✓	1"	✓	"
K-2		Meter			
R-1					
R-2					
PM-1	700 ✓	Alarm ✓	Cont ✓	✓	500 ✓
PM-2	1200 ✓	Low ✓	10" ✓	✓	900 ✓
"	"	Alarm ✓	1" ✓	✓	"
LOG N CALIBRATE ✓		OPERATE ✓		SOURCE No. B-80	
DUMP WELL PROBE LIGHT _____					

START-UP CHECK LIST

Equipment checked by F.I.C. Personnel check by A.K.W.
 Instruments and safeties checked and reset by B.K.R.
 Source in checked by B.K.R. Source No. M-93
 Emergency equipment in control room checked by F.I.C.
 Instruments in trip circuit: K-1 PM-1-2
 Red light on by B.K.R. Time 0800
 Start-up OK'd by F.I.C., B.K.R. Date 8-2-71

H.F.I.R. Core 104-0 & 104-1

Repeat of last run (see p 153)

Water ht = 59.0 cm $d_h = 6.8 \text{ cm}$ Temp °C
 + Per $T_{15} = 22.0^\circ \text{C}$
 $C = 99.96 \text{ su} = 9.9 \text{ f} = 1.5 \text{ f/cm}$ $T_6 = 22.0^\circ \text{C}$
 0855 Water ht = 52.20 cm
 System just critical
 Drain. $C_{sw} = 280.0 - 9.9$
 $= 230.10 \text{ f}$
 H.F.I.R. Core 105-0 & 105-1
 Have H.F.I.R. Core 105-0 & 105-1 assembled in
 small reflector tank. Inner core spaced
 .375" with plastic spacers.

1019 Water ht = 59.0 cm
 System sub critical
 Drain.
~~Water~~ New lower spent fuel elements with
 2 fuel plates #0-3224 & 0-5485.

Water ht = 59.0 cm $d_h = 5.9 \text{ cm}$ Temp °C
 + Per $T_{15} = 22.5^\circ \text{C}$
 $C = 156.45 \text{ su} = 6.9 \text{ f} = 1.2 \text{ f/cm}$ $T_6 = 22.5^\circ \text{C}$
 53.10 cm
 Water ht = 53.10 cm
 System just critical $C_{sw} = 290.0 - 6.9$
 Drain. $= 233.1 \text{ f}$

H.F.I.R. Core 106-0 + 106-1

Now have H.F.I.R. Core 106-0 + 106-1 ensemble in small reflector tank. Inner core spaced .375" with plastic spacers.

1316 Water ht = 59.05 cm
system sub critical
Drain.

Now have spent fuel element with 2 fuel plates #D-3224 + D-5495.

1355 Water ht = 59.0 cm
systems sub critical
Drain.

Temp °C
#15 = 22.7
16 = 23.0

Now have spent fuel element with 4 fuel plates #D-3224 - D-5495 - D-3242 - D-2810.
Puls & enriched strips #3, 7, 8, 9, 10, 13, 17

Water ht = 59.0 cm $DR = 7.16$ cm
3 + Per
C = 69.54 cm = 13.0 f = 1.74/cm.

Temp °C
#15 = 22.7 °C
16 = 23.0 °C

1458 Water ht = 51.40 cm
system just critical
Drain.

core = 391.0 - 130.3 - 13.0
= -247.7F ✓

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3 $\lambda 10^{-12}$	Meter ✓	4"	✓	3 $\lambda 10^{-12}$
"	"	Fast ✓	1"	✓	"
K-2		Meter			
		Fast			
R-1					
R-2					
PIA-1	700V	Alarm ✓	cont	✓	500V
PIA-2	1200V	Low ✓	10"	✓	900V
"	"	Alarm ✓	1"	✓	"

LOG N CALIBRATE OPERATE SOURCE No. A-80

DUMP WELL PROBE LIGHT

START-UP CHECK LIST

Equipment checked by E.D.C. Personnel check by F.D.C.
 Instruments and safeties checked and reset by ARKV
 Source in checked by ARKV Source No. M-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuit: K-1 PIA-1-2
 Red light on by ARKV Time 0810
 Start-up OK'd by F.D.C., ARKV Date 9-3-71

Have H.F.I.R. Core 107-0 & 107-1 assembly in small reflector tank. Inner core spaced 1.375" with plastic spacers.

0935 Water ht = 59.0 cm
System sub critical
Drain.

Now have spent fuel element with 2 fuel plates # D-3224 + D-5495.

1006 Water ht = 59.0 cm
System sub critical
Drain.
Temp °C
#15 = 22.7 °C
16 = 23.0 °C

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870.
Plus 5 enriched strips # 3, 7, 8, 9, 10.

1108 Water ht = 59.0 cm
System first critical
Drain.
Temp °C
#15 = 23.0 °C
16 = 23.2 °C

$Q_{th} = 391.0 - 130.3 \text{ W}$
 $= 260.7 \text{ W}$

Have H.F.I.R. Core 108-0 & 108-1 assembly in small reflector tank. Inner core spaced 1.375" with plastic spacers.

1315 Water ht = 59.0 cm
System sub critical
Drain.

Now have spent fuel element with 2 fuel plates # D-3224 + D-5495.

Water ht = 59.0 cm
System sub critical
Drain.

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3242, D-2870.
Plus 4 enriched strips # 7, 8, 9, 10.

Water ht = 59.0 cm
Drain
Temp °C
#15 = 23.5 °C
16 = 23.5 °C
 $Q_{th} = 36.92 \text{ W} = 11.0 \text{ W} = 1.5 \text{ W}$

1512 Water ht = 51.8 cm
System first critical
Drain.
 $Q_{th} = 391.0 - 102.9 - 11.0$
 $= 277.1 \text{ W}$

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE DISTANCE	SET	START-UP RANGE
K-1	3×10^{-12}	Meter <input checked="" type="checkbox"/>	4"	<input checked="" type="checkbox"/>	3×10^{-12}
"	"	Fast <input checked="" type="checkbox"/>	1"	<input checked="" type="checkbox"/>	"
K-2		Meter			
		Fast			
R-1					
R-2					
PIA-1	700V	Alarm <input checked="" type="checkbox"/>	cont	<input checked="" type="checkbox"/>	500V
PIA-2	1200V	Low <input checked="" type="checkbox"/>	10"	<input checked="" type="checkbox"/>	900V
"	"	Alarm <input checked="" type="checkbox"/>	"	<input checked="" type="checkbox"/>	"
LOG N CALIBRATE <input checked="" type="checkbox"/>		OPERATE <input checked="" type="checkbox"/>	SOURCE No. D-80		
DUMP WELL TROBE LIGHT <input type="checkbox"/>					

START-UP CHECK LIST

Equipment checked by Z.D.C. Personnel check by F.P.C.
 Instruments and safeties checked and reset by R.K.M.
 Source in checked by R.K.M. Source No. M-23
 Emergency equipment in control room checked by F.D.C.
 Instruments in trip circuits: K-1, PM-1-2
 Red light on by R.K.M. Time 0920
 Start-up OK'd by F.D.C., R.K.M. Date 8-9-71

H.F.L.R. Core 109-0 + 109-1

Hand H.F.L.R. Core 109-0 + 109-1 assembly in small reflector tank. Inner core spaced apart 375" with plastic spacers.

0853 Water ht = 59.10 cm
 System sub critical
 Drain.

Now have spent fuel element with 2 fuel plates #D-3224 & D-5495.

0910 Water ht = 59.10 cm
 System sub critical
 Drain.

Temp °C
 #15 = 23.0°C
 16 = 23.0°C

Now have spent fuel element with 4 fuel plates #D-3224, D-5495, D-3242, D-2870. Plus 4 enriched strips #7, 9, 10, 11, 12, 13.

alt = 6.5 cm

Water ht = 59.10 cm
 + Rev
 T = 121.69 sec = 8.97 = 1.39/cm

Temp °C
 #15 = 23.0°C
 16 = 23.2°C

Water ht = 52.60 cm
 System just critical
 Drain.

Core = 391.0 - 102.9 - 8.4
 = -279.7°C

C.F. = 2 cone

Have C.F.-2 assembly in ~~small~~ small
reflector tank. Have spent fuel element
with 4 fuel plates # 0-3229, 0-5495, 0-3242
& 0-2870. Plus 3 enriched strips # 4, 8, 10
and 1 natural strip # 2.

Water ht = 59.10 cm ^{dh = 9.0 cm} Temp °C
2 per #15 = 23.0 °C
C = 73.88 sec = 12.8 ft = 1.4 ft/sec
16 = 23.5 °C

13 & 5 Water ht = 50.10 cm
system just critical
Drain. core = 391.0 - 92.2 = 12.8
= -286.8 ft

2-2-72 Fuel rate 3.2 cm/min
3/4" Drain rate = 9.7 cm/min
3" Dump rate = 34.50 cm/10 sec.

Top of inner element = 48.0 cm
" " Outer element = 47.1 cm.

INSTRUMENT CHECK

INSTRUMENT	RANGE	TRIP	SOURCE	SET	START-UP
K1 3X10 ⁻¹²		✓	2"	✓	3X10 ⁻¹²
"		✓	1"	✓	"
K2 3X10 ⁻¹²		✓	3"	✓	"
"		✓	3"	✓	"
700V	High	✓	Cent	✓	500V
1200V	Low	✓	8"	✓	900V
"	High	✓	1"	✓	"

LOG IN OPERATE OPERATE SOURCE No. B-80

DUMP WELL TROBE LIGHT

START-UP CHECK LIST

Equipment checked by I.D.C. Personnel check by I.D.C.
 Instruments and systems checked and signed by RKAL
 Source is checked by RKM Source No. 19-43
 Emergency equipment in control room checked by F.D.C.
 Instruments in control room: K-1-2 P-19-1-2
 All light on by RKM Time 0845
 Start-up OK'd by F.D.C. RKM Date 2-2-72

H.F.I.R. cones
 116-0 & 116-F

Have H.F.I.R. cone 116-0 & 116-F assemble in small reflector tank, inner cone spaced .375" with plastic spacers.

0932 Water ht = 59.10 cm
 System sub critical
 Drain.

Now have spent fuel element with 2 fuel plates # D-3224 & D-5495.

1040 Water ht = 59.0 cm Temp °C
 System sub critical
 Drain.
 # 15 = 23.2 °C
 16 = 23.5 °C

Now have spent fuel element with 4 fuel plates # D-3224, D-5495, D-3222, D-2870. Plus 6 enriched strips # 7, 3, 5, 6, 8, 10 and natural strips (2) # 4, 5.

1135 Water ht = 59.40 cm
 System sub critical
 Drain.

H. F. L. R. Coner
116-0 & 116-E

Removed natural strip # 4 & 5. plus wrinkled
strips # 10 & 5. New lower & fuel plates
plus wrinkled strips # 2, 3, 6, 8.

Water ht = 59.40 cm $\Delta h = 7.0$ cm

+ Per

$t = 108.6$ ms = 9.3 f = 1.34/cm

Temp °C

#15 = 23.7 °C

#16 = 29.2 °C

1317 Water ht = 52.40 cm
system just critical
Drain.

core = 391.0 - 103.1 - 9.3

= -278.6 f

Repeat of above:

Water ht = 59.20 cm
+ Per

1526 Water ht = 52.40 cm
system just critical
Drain