

Test Ref. No. RT-508System Ref. No. 11, 12

FORT ST. VRAIN NUCLEAR GENERATING STATION

REQUEST FOR TEST

Prepared By:

M B Dolphin8/4/78  
Date

Reviewed By:

M Jedin8/4/78  
Date

Original Issue Reviewed, PORC #

N/A data collection only, 144B  
DateApproved &  
Issued:s/ Larry Brey8/4/78  
Date

Safety

Significant:

Yes

No X

NFSC Review:

## RECORD AND CONTROL OF REVISIONS

Rev. No.	Prepared By	PORC Approval	Approved & Issued Effective Date of Revision
1	J. J. Bauer	Not Reg'd Wht	Matthews/11/1/78
2	L. J. Bauer	PORC 312 JUN 14 1979	Omroth 6/14/79
3	W. J. Bauer	Not Reg'd om	Omroth 7/9/79
4			
5			
6			
7			

Completed Test Reviewed:

Superintendent, Operations (or designee)

366 230

7907200 267

PROCEDURE CHANGES:

☐

Permanent

☐

Temporary

PAGE NO.	DESCRIPTION AND REASON FOR CHANGE OR DEVIATION	SAFETY EVALUATION

APPROVALS:

Plant Management Staff (Senior License)

Date

Plant Management Staff

Date

**NOTICE TO TEST CONDUCTOR**

IT IS MANDATORY THAT THIS DEVIATION BE REVIEWED BY POPC  
NO LATER THAN 14 DAYS FROM THE DATE OF SIGNATURE. YOU  
ARE RESPONSIBLE FOR HAVING THIS DONE.

Revision No. 3

Test Ref. No. RT-508 Rev. 2

System Ref. No. 11 & 12

Request for Test - Sheet 5

10) TEST EQUIPMENT (If required)

<u>Name</u>	<u>Identification Number</u>	<u>Last Calibration Date</u>
Digital Readout for chromel alumel T/CS		10/10/01
Honeywell FM-Tape Recorders		
Honeywell Amplifiers		
G.R. Displacement Probes		
B&K Accelerometers		
Data Control System		
Multiplexing Equipment		
MCRD instrumentation		
11) TEST CONDUCTOR		
(Include all assistants)		

Permission to initiate test \_\_\_\_\_  
Shift Supervisor Date

12) PROCEDURE (See attached pages):

Test Ref. No. RT-508 Rev. 2

System Ref. No. 11 & 12

Request for Test - Sheet 6

13) VERIFY THAT THE SYSTEM HAS BEEN RETURNED TO NORMAL:

\_\_\_\_\_  
s/Shift Supervisor Date

14) TECHNICAL SERVICES ACTION:

10 CFR 50.59 Report Required: Yes \_\_\_\_\_ No \_\_\_\_\_

Tech Spec Report Required: Yes \_\_\_\_\_ No \_\_\_\_\_

Reviewed by \_\_\_\_\_  
Signature Date

DATE 6-11-79ISSUED 7-1-79REQUEST FOR TESTREQUESTER R.M. Dryden/G.J. Conklin SYSTEM 11. 12

## PURPOSE/OBJECTIVE

The purpose of this RT is to supply instrumentation and the method of usage for fluctuation testing. The objective is to monitor various plant parameters to determine the cause and possible corrective actions required for core fluctuations.

All fluctuation testing will be performed under other RTs (RT-500).

## DESCRIPTION OF TEST

See Attachment I.

Rev. 3 corrected Table 1 (page 6), corrected B&K sensitivity (page 9), corrected Gain Table (page 12), corrected Instrument Channel number (page 18), completed T/C layout (page 17) improved data taking procedure after a trial run.

## DATA REQUIRED

1. Data acquisition package.
2. Magnetic tape recordings.

## ANTICIPATED RESULTS/ACCEPTANCE CRITERIA

Instrumentation will provide needed information to understand the cause of core fluctuations. Data recorded on the magnetic tape will be sent to General Atomic in San Diego to be analyzed. There are no anticipated results or acceptance criteria.

REF SOP OR ABNORMAL CONDITIONS SOP 12-04

## SCHEDULE REQUIREMENTS

SAR &amp; APPROVAL SHEET ATTACHED

WORK ASSIGNED BY

EVALUATION COMPLETED

REVIEWED BY

Distribution:

Requester L.D. Johnson G. Lipsch  
GA-SD-Ref. Library R. Kapernick W. Hawkins  
W. Breher K. E. Asmussen D. Scott  
W. Simon G. Bramblett

W. Franek  
T. Tersini  
T. Wachle  
L. Hill

R.D. Phelps  
R. J. Nirschl

366 234

This SAR is in Support of RT-508 and is enclosed as Page 2 of 20  
of that RT even though the SAR is a separate Uncontrolled Document.

(CHECK WITH DOCUMENT CENTER FOR LATEST ISSUE)

GENERAL ATOMIC COMPANY  
FORT ST. VRAIN NUCLEAR GENERATING STATION  
SAFETY ANALYSIS REPORT

1. INITIATING DOCUMENT: RT-508 Rev. 3
- |                                                         |                       |                              |                                        |                                                  |
|---------------------------------------------------------|-----------------------|------------------------------|----------------------------------------|--------------------------------------------------|
| 2. CATEGORY:                                            | PLANT CHANGE          | YES <input type="checkbox"/> | NO <input checked="" type="checkbox"/> | DOCUMENT CHANGE ONLY <input type="checkbox"/>    |
|                                                         | CLASS I               | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    | MAINTENANCE <input type="checkbox"/>             |
|                                                         | SAFE SHUTDOWN COOLING | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    |                                                  |
| 3. FAILURE MODES AFFECTED                               |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    | TEST <input checked="" type="checkbox"/>         |
| 4. SAFETY RELATED COMPONENT, SYSTEM OR STRUCTURE CHANGE |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    | STATE IN ITEM 10 THE BASIS FOR THE BOXES CHECKED |
| 5. SAFETY SIGNIFICANT CHANGE                            |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    |                                                  |
| 6. UNREVIEWED SAFETY QUESTION                           |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    |                                                  |
| 7. TECH SPECIFICATION CHANGE                            |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    |                                                  |
| 8. FSAR CHANGE                                          |                       | <input type="checkbox"/>     | <input checked="" type="checkbox"/>    |                                                  |
9. APPLICABLE FSAR OR TECH SPEC SECTIONS REVIEWED: \_\_\_\_\_

10. BASIS FOR SAFETY EVALUATION: (Add additional Sheets if Required): \_\_\_\_\_

The installation and operating conditions of these test stations will not affect plant operation or safety in any way. PSC Health Physics will direct any work in the area of the open T/C penetrations.

(Rev.2) No change to above SAR R/c 6/5/79

(Rev.3) No change to above SAR R/c 6/29/79

11. IS SAN DIEGO SAFETY ANALYSIS/LICENSING REVIEW REQUIRED? YES ☐ NO ☒

12. HAS SAN DIEGO SAFETY ANALYSIS/LICENSING REVIEW BEEN PERFORMED? YES ☐ NO ☒

13. Thomas Conline 6/5/79 R/c 6/29/79  
INITIATOR/DATE LICENSING/DATE

14. GAC ENGR. REVIEW/DISPOSITION: I concur with the above evaluation  
366 235

REV. 3. Concur with above R/c 6/29/79  
ENG'R/DATE Robert D. Gyles 6/5/79

## ATTACHMENT I - DESCRIPTION OF TEST

### 1.0 GENERAL DESCRIPTION OF TEST

Various instruments will monitor parameters for investigation of the core temperature fluctuations. This information, after being recorded on magnetic tape, will be sent to San Diego for analysis, acceptance, and determination of possible fixes.

These parameters will be recorded on 2 Honeywell 101 tape recorders simultaneously. A tape will be sent to San Diego for analysis and the other tape retained on site. General plant parameters will be signal conditioned and multiplexed at station 6, main recording station, located in the auxiliary control room. Station 6 equipment, therefore, consists of signal conditioning and multiplexing for parameters; plus 2 Honeywell 101 tape recorders and demultiplexing for data play back. Station 7, level 7, is located in the northwest corner of the reactor building. This station consists of signal conditioning and multiplexing equipment. Station 11, level 11, is located in the southwest corner of the reactor building. This station consists of signal conditioning and multiplexing equipment for the MCRD'S. Parameters for stations 6, 7, 11 are listed on sheet 1 of each Appendix.

### 1.1 EQUIPMENT REQUIREMENTS

The equipment utilized for the individual stations shall have suitable test and calibration procedures. Equipment shall be traceable to NBS standards and shall have up-to-date calibration. The following lists the applicable procedures.

Digital readout for chromel alumel T/CS (Procedure TCRO)

Honeywell FM-Tape Recorders (Procedure HON-DIRECT-100)

Honeywell Amplifiers (Procedure ACC-122)

G.R. Displacement Probes (Procedure I.T.I. Probe)

B&K Accelerometers (Manufacturer's Calibration)

Keithley Picoammeter ( Procedure Keith - 414A )

Data Control System Multiplexing Equipment (procedure DCS-6, 7, 11)

SPND Amplifier GAC manufactured (Procedure SPND-1)

Brush Charts: Used on-line to determine if fluctuations testing limits are exceeded. 12 Stm. Gen. outlet temperatures (narrow & wide range) and the 6 PPS channels. Steam Generator Computer may be used in lieu of brush charts for steam generator temps. Page 6, Table 1, lists brush chart data for each recorder.

## 1.2 SCHEDULE REQUIREMENTS

This RT does not define the initial plant condition, test requirements, or schedule for fluctuation testing. Therefore, the Data Acquisition test equipment will be used as called out by other RTs.

## 2.0 INSTRUMENTATION INSTALLATION

The first sheet of Appendixes 1,2,3 lists the corresponding instruments for each applicable station.

## 3.0 DATA

### 3.1 General

The data package will call-out the operating instructions, checklists, and appropriate data logs for each station. These shall be filled out when data are recorded on tape. Two identical tapes will be made for each test. One tape will be sent to San Diego for analysis and the other retained at site until notified by San Diego to release it for further use. It should be noted that both recorders are independent of one another and in the event one recorder is inoperable the other will still record and that tape will be sent to San Diego.

### 3.2 Modifications to Data Packages

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The Station Data Packages given in the Appendices to this RT are intended to be representative and may be modified from time to time as equipment is varied or improvements in procedures are developed from operating experience. The station operator may show on-the-spot deviations via appropriate markup.



#### 4.0 FIGURES AND TABLES OF PROBES AND MAGNETOMETERS

Figure 1, Page 7, shows the physical locations for the PCRV Displacement probes and the B&K Accelerometer Probe. Figure 2, Page 8, shows the physical locations for the upper and lower magnetometers. Table 2, Page 9, is the data sheet of sensitivities for the DPs and magnetometers.

#### 5.0 THERMOCOUPLE CONVERSIONS AND MEASUREMENTS

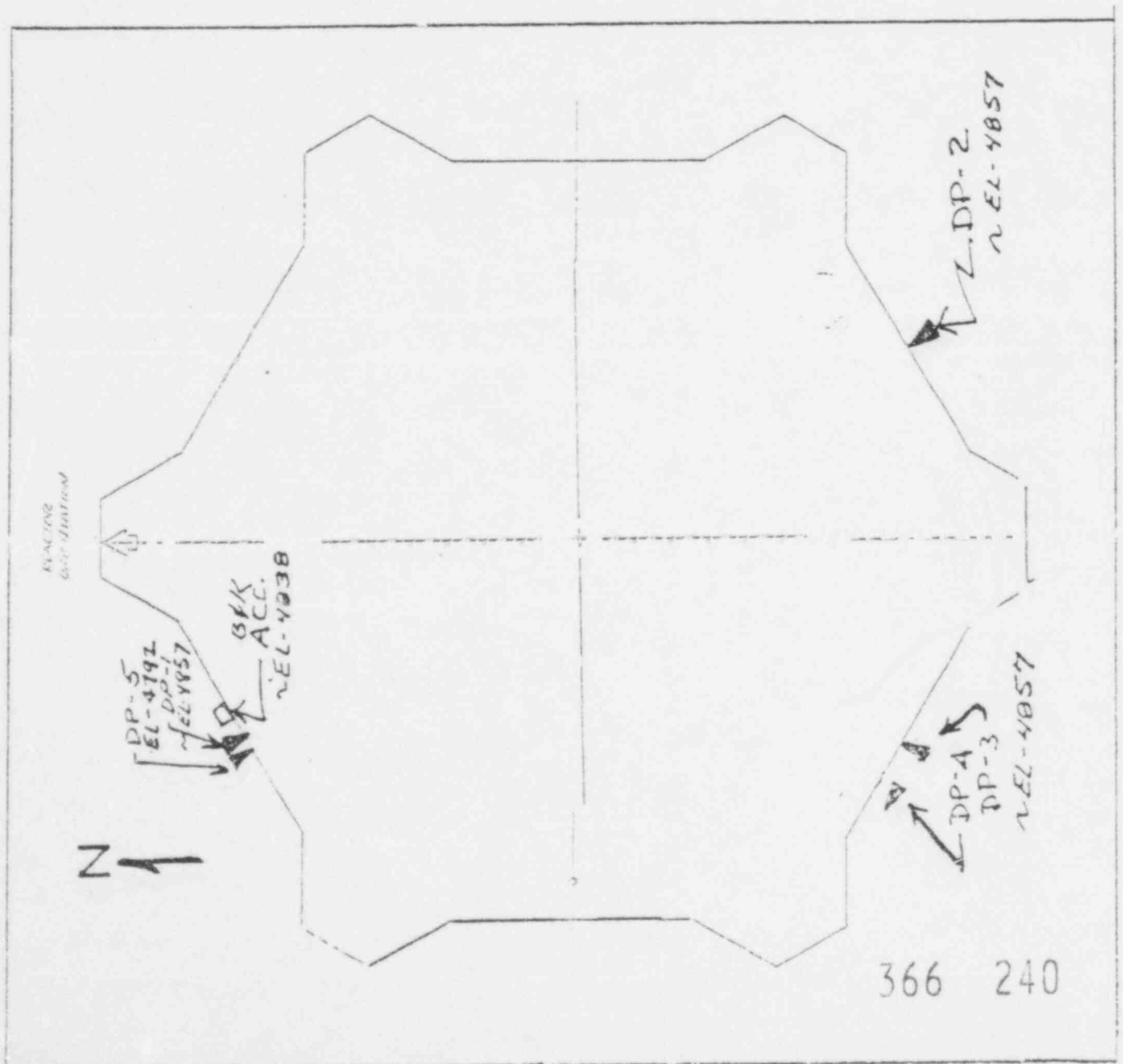
Table 3, Page 10, lists the applicable temperature conversions for the 26 T/Cs on Level 7.

TABLE 1  
Brush Chart Data

Variable	Brush Recorder Channel	P.P.	Range	Gain
B-1-1 MST	1	-	$\pm 50^{\circ}\text{F}$	20 MV/div
B-1-2 MST	2	-	"	"
B-1-3 MST	3	-	"	"
B-1-4 MST	4	-	"	"
B-1-5 MST	5	-	"	"
B-1-6 MST	6	-	"	"
B-2-1 MST	7	-	$\pm 50^{\circ}\text{F}$	20 MV/div
B-2-2 MST	8	-	"	"
B-2-3 MST	9	-	"	"
B-2-4 MST	10	-	"	"
B-2-5 MST	11	-	"	"
B-2-6 MST	12	-	"	"
NIM 1133-3	13	1C	25-100%	*200 MV/div
NIM 1134-3	14	2C	"	"
NIM 1135-3	15	2E	"	"
NIM 1136	16	2F	"	"
NIM 1137	17	219	"	"
NIM 1138	18	220	"	"
B-1-1 MST	19	054	$700^{\circ}\text{-}1100^{\circ}\text{F}$	100 MV/div
B-1-2 MST	20	055	"	"
B-1-3 MST	21	056	"	"
B-1-4 MST	22	057	"	"
B-1-5 MST	23	058	"	"
B-1-6 MST	24	059	"	"
B-2-1 MST	25	163	$700^{\circ}\text{-}1100^{\circ}\text{F}$	100 MV/div
B-2-2 MST	26	164	"	"
B-2-3 MST	27	165	"	"
B-2-4 MST	28	166	"	"
B-2-5 MST	29	167	"	"
B-2-6 MST	30	168	"	"
DEMUX Chan 14	31	119	-	200 MV/div
" " 13	32	07	-	"
" " 12	33	3I	-	"
" " 11	34	3J	-	"
" " 10	35	2K	-	"
" " 9	36	3L	-	"

\* 1.5%/div

Figure 1



1534E	DATE	CORE FLUCTUATIONS SIGNAL CONDITIONS & RECORDING STATION # 7 EQUIPMENT LOCATION BY <i>W</i> REVIEWED <i>W</i>
A	7/8/8	
B	8/2/8	
C	5/1/9	



Table 2  
Station 7 Data Sheet

Instrument #	Location	Function	Sensitivity
DP1	NW/Core Top	Radial Displ.	1.224 Mils/Volt
DP2	SE/Core Top	Radial Displ.	1.476 Mils/Volt
DP3	SW/Core Top	Radial Displ.	1.576 Mils/Volt
DP4	SW/Core Top	Tangential Displ.	1.430 Milt/Volt
DP5	NW/PCRV Bottom	Radial Displ.	.002 q/volt
B&K	NW/Core Middle	Radial Accel.	
L1	NE/Lower	Core Barrel Motion	
L2	E/Lower	"	
L3	SE/Lower	"	
L4	SW/Lower	"	
L5	W/Lower	"	
L6	NE/Lower	"	
U1	NE/Upper	"	
U2	E/Upper	"	
U3	SE/Upper	"	
U4	SW/Upper	"	
U5	W/Upper	"	
U6	NE/Upper	"	

Table 3

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## TEMPERATURE CONVERSION TABLE FOR THE 26 TC's ON LEVEL 7

$^{\circ}\text{F}$	$^{\circ}\text{C}$	Millivolts from T/C	Voltage to be Recorded
1650	898.9	37.281	1.503
1600	871.1	36.166	1.392
1550	843.3	35.042	1.279
1500	815.6	33.915	1.167
1450	787.3	32.776	1.053
1400	760.0	31.629	.938
1350	732.2	30.474	.822
1300	704.4	29.313	.706
1250	676.7	28.149	.590
1200	648.9	26.976	.473
1150	621.1	25.798	.355
1100	593.3	24.617	.237
1050	565.6	23.437	.119
1000	537.7	22.251	.000
950	510.0	21.066	-.118
900	482.2	19.882	-.237
850	454.4	18.770	-.355
800	426.7	17.524	-.473
750	398.9	16.349	-.590
700	371.1	15.178	-.707
650	343.3	14.012	-.824
600	315.6	12.856	-.940
550	287.3	11.703	- 1.055
500	260.0	10.560	-1.169
450	232.2	9.429	-1.282
400	204.4	8.312	-1.394
350	176.7	7.207	-1.504

APPENDIX 1 TO RT-508  
DATA PACKAGE FOR STATION 11

Run No. \_\_\_\_\_ Date \_\_\_\_\_

Station Operator \_\_\_\_\_

A. INSTRUMENTS

INSTRUMENT	TRACK NO.	CHANNEL NO.
* <u>MCRD 1</u>		
CPL-20 Fission Couple	7	14
FC-20 Fission Chamber	7	13
P-20 Orifice delta-P	7	12
ND 20 Neutron Detector	7	11
TCT 20 He Temp.	7	10
TCM 20 He Temp.	7	9
TCB 20 He Temp.	7	8
MIC 20 Kaman Microphone	4	3C
* <u>MCRD 2</u>		
CPL-43 Fission Couple	8	14
FC-43 Fission Chamber	8	13
P-43 Orifice delta-P	8	12
ND 43 Neutron Detector	8	11
TCT 43 He Temp.	8	10
TCM 43 He Temp.	8	9
TCB 43 He Temp.	8	8
D-43 Region Vert. Displacement	12	15
MIC 43 Gulton Microphone	10	3C

\* MCRD 1 is in Region 5

\* MCRD 2 is in Region 35

### 3. INITIAL SET-UP

1. Verify the amplifier settings for the Honeywell amplifiers are as follows:

Assembly #	11A8					
Signal ID No.:	CPL-20	FC 20	P20	TCT,M,B-20	MIC-20	
Gain	1000;X1.	100;X.001	1000;X.001	100;X1.	100;X1.	
Fine Gain	OUT	OUT	OUT	OUT	OUT	
Output	NORM	NORM	NORM	NORM	NORM	
Filter	10(Hz)	10(Hz)	10(Hz)	10(Hz)	1000 (Hz)	
Bias	OFF	OFF	OFF	+	+	

Assembly #	11A9						
Signal ID No.:	CPL-43	FC 43	P43	TCT,M,B-43	D43	MIC-43	
Gain	1000;X1.	1000;X.001	1000;X.001	100;X1.	100;X.001	5000;X.001	
Fine Gain	OUT	OUT	OUT	OUT	OUT	OUT	
Output	NORM	NORM	NORM	NORM	NORM	NORM	
Filter	10(Hz)	10(Hz)	10(Hz)	10(Hz)	N/A	1000 (Hz)	
Bias	OFF	OFF	OFF	+	OFF	OFF	

2. Record FC-20 and FC-43 dial and meter readings from the Keithley picoameters 414A located in Assembly 11A7. (When '3' is selected on the dial, the lower meter scale is read and when '1' is selected the upper scale is read).

FC-20: Dial \_\_\_\_\_ Meter \_\_\_\_\_.

FC-43: Dial \_\_\_\_\_ Meter \_\_\_\_\_.

3. Record the percentage and range from the self-power neutron detectors SPND-20 and SPND-43 located in Assembly 11A7.

SPND-20% \_\_\_\_\_ Range \_\_\_\_\_.

SPND-43% \_\_\_\_\_ Range \_\_\_\_\_.

4. Record the voltages from the Kaman Power Supply D.V.M. located in Assembly 11A3.

Dial 2, CPL-20 \_\_\_\_\_.

Dial 3, CPL-43 \_\_\_\_\_.

Dial 4, P-20 \_\_\_\_\_.

Dial 5, P-43 \_\_\_\_\_.

Dial 6, D-43 \_\_\_\_\_.

5. Verify that the multiplexer in Assembly 11A7 is powered on and the  $\pm 22V$  lights are on. Also, both switches on the DCV card must be in the down position \_\_\_\_\_.



APPENDIX 2 TO RT-508  
DATA PACKAGE FOR STATION 7

Run No. \_\_\_\_\_ Date \_\_\_\_\_

Station Operator \_\_\_\_\_

A. INSTRUMENTS

INSTRUMENT	TRACK NO.	CHANNEL NO.
26 lower Core He temperatures	2	PCM MPX * Same As T. C. Number
5 PCRV Horiz. DISP. PROBES		
DP1	9	13
DP2	9	14
DP3	9	15
DP4	9	13
DP5	5	14
1 PCRV - Accel. Probe (B&K)	5	15
12 Core Magnetometers		
L1	5	12
L2	5	11
L3	5	10
L4	9	12
L5	9	11
L6	9	10
U1	11	15
U2	11	14
U3	11	13
U4	11	12
U5	11	11
U6	11	10

\* Position on MPX Card

(Please check off blanks or fill in data as requested using black felt pen)

B. Initial Set-up

1. Verify that the FC-1 and FC-2 batteries are set at +45 VDC and the Keithley amplifiers are on. \_\_\_\_\_. (If not "ON" turn on and allow a couple of minutes warm up.)
2. Record FC-1 and FC-2 dial and meter readings from the Keithley picoameters 414A. (When '3' is selected on the dial, the lower meter scale is read and when '1' is selected the upper scale is read).  
FC-1: Dial \_\_\_\_\_, Meter \_\_\_\_\_.  
FC-2: Dial \_\_\_\_\_, Meter \_\_\_\_\_.
3. Verify that the multiplexer in assembly 7A2 is powered on, the +22V and +5V lights are on. Also, both switches on the DCV card must be in the down position. \_\_\_\_\_.

C. Confirmation of Channel Integrity

1. Verify output of thermocouples by use of the digital readout and log readings on attached "THERMOCOUPLE LOG", Table 1.

NOTE: Chromel-alumel thermocouples have an approximate output of .042 MV/°C.

2. Check gain settings of all Honeywell amplifiers are as follows: \_\_\_\_\_.

Assembly #	7A3,4,5,6	7A3
Signal ID #	(TC-1) thru (TC-26)	B&K
Gain	~100; X1.	5000; X .01
Fine Gain	OUT	OUT
Output	NORM	NORM
Filter	N/A	10 (Hz)
Bias	+	OFF

3. Table 2, Page 16 lists the measurements and penetration locations track number and channel number for the Multiplex System. Page 17 lists the thermocouple distances for each penetration. This page originates and is updated via RT-524. An updated copy will be included in this appendix.

Table 1

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## DATA PACKAGE FOR STATION 7

(Sht. of )  
THERMOCOUPLE LOG

Run No. \_\_\_\_\_

CHANNEL	INITIAL READING	SUBSEQUENT READINGS IF TAKEN	
	Time _____	Time _____	_____
	TEMPERATURE °C	VOLTAGES	TEMPERATURE °C *
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			

NOTE: If T/C selector switch is placed on "OFF" it will indicate 1400°C "BLINKING"

NOTE: Leave indicator in "OFF" when taking data on recorders

TABLE 2

Measurement (Thermocouple #)	Location	Channel Number	Word Location
1	E1	1	3
2	E1	2	4
3	E2	3	5
4	E2	4	6
5	E2	5	7
6	E2	6	8
7	E3	7	9
8	E3	8	10
9	E3	9	11
10	E3	10	12
11	E4	11	13
12	E4	12	14
13	E4	13	15
14	E4	14	16
15	E5	15	17
16	E5	16	18
17	E5	17	19
18	E5	18	20
19	E6	19	21
20	E6	20	22
21	E6	21	23
22	E6	22	24
23	E7	23	25
24	E7	24	26
25	E1	25	27
26	E7	26	28

Word locations 1 and 2 are for Frame Sync.

T/C LOCATION  
FM DATA SYSTEM

DATE 6, 1, 79  
TIME 1300

T/C's MOVED

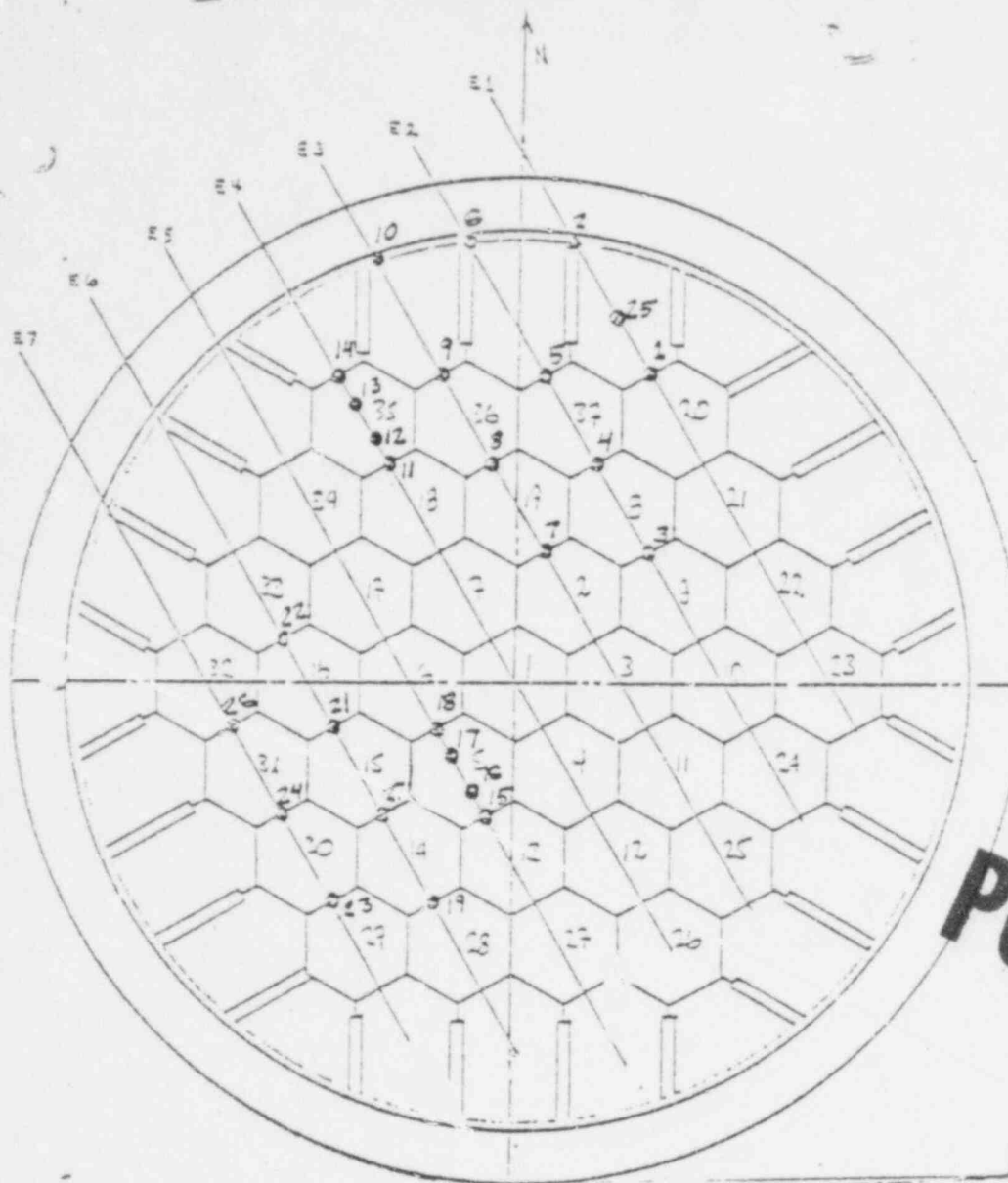
RT 524

REASON INITIAL SET:

AUTH: P. Mischel

SD MEMO FFE-186

**POOR ORIGINAL**



FM CHANNEL	T/C #	Tout Penet	LOCATION	COMMENT	FM CHANNEL	T/C #	Tout Penet	LOCATION	COMMENT
1	1	E1	21' 9.5"	NW QUAD SAME AS PREV. FLUCTUATION SETTINGS	13	13	E4	17' 10.5"	REG. 35
25	25	E1	19' 4"		14	14	E4	16' 11"	ICRD
2	2	E1	16' 9"		15	15	E5	31' 3"	REG. 5
3	3	E2	26' 6"		16	16	E5	30' 3.5"	
4	4	E2	23' 2.5"		17	17	E5	28' 6.5"	ICRD
5	5	E2	20' 2"		18	18	E5	27' 10.5"	
6	6	E2	15' 3"	S.W. QUAD. LOCATIONS	19	19	E6	32' 10"	
7	7	E3	25' 0.5"		20	27	E6	29' 7"	
8	8	E3	21' 8"		21	21	E6	26' 4"	
9	9	E3	18' 5"		22	22	E6	23' 2"	
10	10	E3	14' 2"		23	23	E7	31' 1"	
11	11	E4	20' 2"		24	24	E7	28' 0"	366
12	12	E4	19' 4"		26	26	E7	24' 8"	250

DATA PACKAGE FOR STATION 6

Run No. \_\_\_\_\_ Date \_\_\_\_\_

Station Operator \_\_\_\_\_

Recorder 1 \_\_\_\_\_

Data Start \_\_\_\_\_ Data End \_\_\_\_\_ Tape No. \_\_\_\_\_

Recorder 2 \_\_\_\_\_

Data Start \_\_\_\_\_ Data End \_\_\_\_\_ Tape No. \_\_\_\_\_

A. Instruments

Instrument	Track Number	Channel Number
NIM 1133-3	1	15
NIM 1134-3	1	14
NIM 1135-3	1	13
NIM 1136	1	12
NIM 1137	1	11
NIM 1138	1	10
POT 1112	3	14
Core Flow Res.	3	12
ZI-1233-1	3	13
Spare	3	15
FC-1 (Fission Chamber)	3	11
FC-2 " "	3	10
Time Code	6	WB1

B. Initial Set-Up

1. Verify the amplifier settings for the Honeywell Amplifiers are as follows:

Assembly #	6A5	6A6	
	(N-3) thru (N-8)	Z	FC1, FC2
Signal ID No.			
Gain	2000; X.001	5000; X.001	1000; X.01
Fine Gain	out	out	out
Output	Norm.	Norm.	Norm.
Filter	10(Hz)	10(Hz)	10 (Hz)
Bias	+	+	OFF

2. Verify that the multiplexer in assembly 6A4 is powered on, the  $\pm 22V$  and  $\pm 5V$  lights are on. Also, both switches on the DCV card must be in the down position.

C. Recorder Self Test and System Calibration

Check off blanks or fill in data as requested. Check once (✓) for Recorder 1 and twice (✓✓) for recorder 2.

- Load the test tape per instructions on recorder. Set tape footage counter to "0". \_\_\_\_\_
- Press and hold "STOP" until indicator illuminates. \_\_\_\_\_
- Run 50 feet (approx.) using "FAST" and "FWD" (Depress "STOP" at approx. 30 feet to allow for coast down) \_\_\_\_\_

4. Select 0.937 (15/16) IPS tape speed \_\_\_\_\_.
5. Confirm that digits corresponding to tape speed selected appear in "IPS" window. \_\_\_\_\_.

The following Steps 6-12 are for internal recorder calibration.

6. Depress "CAL" and confirm status indication. \_\_\_\_\_.
7. Confirm calibrate Source is on "INT". \_\_\_\_\_.
8. Depress "REC" and "FWD" simultaneously. Tape motion begins. \_\_\_\_\_.
9. Press "AUTO TEST". ("AUTO TEST" light should come on) \_\_\_\_\_.
10. The machine, now performs self-test of each channel. "AUTO TEST" is illuminated, test lights sequence LB/ZERO; 0.1 IBE/-DEV; BE+ DEV light sequence and channel number in "CHANNEL" window steps from 01 to 14. \_\_\_\_\_.
11. At completion of "AUTO CAL", machine stops tape motion, resets channel window to "01", and "CAL" indicator is illuminated steady. (If motion stops before completion of Chan 14 "AUTO TEST", and "CAL" indicator is blinking, notify maintenance of failed channel as indicated in "CHANNEL" window.) NOTE: In general you should continue to record as this does not mean acquired data is useless.
12. Cancel "CAL" status by depressing "CAL" button. \_\_\_\_\_.
13. Record tape footage: For Recorder 1 \_\_\_\_\_ feet. Record tape footage for Recorder 2 \_\_\_\_\_ feet.

The following Steps 14-18 are for System Calibration.

14. Depress "REC" and "FWD" simultaneously. Tape motion begins \_\_\_\_\_.
15. Cycle the calibrator, located on Panel 6A3, by depressing the calibrate button. Depress HI and LO Cal button through the following position. in each position of the calibrator output allow a minimum of 2 feet (approximately 25 seconds).  
low \_\_\_\_\_; High \_\_\_\_\_; low \_\_\_\_\_.
16. Depress "Calibrate" button to place system in operate mode. \_\_\_\_\_.
17. Stop the tape by depressing the "STOP" button. \_\_\_\_\_.
18. This cancels system calibration.  
Recorder 1 tape footage: \_\_\_\_\_ feet.  
Recorder 2 tape footage: \_\_\_\_\_ feet.
19. Have you experienced any problems?

Yes \_\_\_\_\_ NO \_\_\_\_\_ (If yes please explain below:)

You are now ready for data acquisition.

D. Data Acquisition (Check once (✓) for Recorder 1; Check twice (✓✓) for Recorder 2)

1. Start recording by depressing "REC" and "FWD" pushbuttons simultaneously on Recorder 1 \_\_\_\_\_.

Record time of tape start \_\_\_\_\_.

Repeat on Recorder 2 \_\_\_\_\_.

Record Time of tape start \_\_\_\_\_.

1a. Verify on Assembly 6A1 that the main frame lock light is on.  
START HERE FOR ENDING DATA RUN:

2. At the completion of the data run stop tape by depressing "STOP" pushbuttons \_\_\_\_\_.

3. Enter end of Recorder 1 tape run: \_\_\_\_\_ feet. Record time of tape stop: \_\_\_\_\_.

4. Enter end of Recorder 2 tape run: \_\_\_\_\_ feet. Record time of tape stop: \_\_\_\_\_.

5. Repeat steps C.14 thru 17 for system calibration.

Recorder 1 tape footage: \_\_\_\_\_ feet

Recorder 2 tape footage: \_\_\_\_\_ feet

6. Rewind tape by depressing "FAST" and "REV" \_\_\_\_\_.

7. Remove tape and put on label \_\_\_\_\_.

8. Return Data packages and tapes as directed by Gordon Conklin.