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December, 1965

Westinghouse Astronuclear Laboratory

PRELIMINARY DATA REPORT

PRESSURE TRANSDUCER IRRADIATION TEST AT THE PLUM BROOK REACTOR FACILITY

23/W508

MASTER

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December, 1965

Westinghouse Electric Corporation
Astronuclear Laboratory
Pittsburgh, Pennsylvania 15236

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23/W508

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Prepared By:

H. O. Blinn

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Approved By:

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INFORMATION CATEGORY

Unclassified

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Date

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1.0 INTRODUCTION

This report contains the data obtained during an irradiation test of six pressure transducers at the Plum Brook Reactor Facility at Sandusky, Ohio. The test designated No. 23/W508 was conducted by Westinghouse personnel on November 15 and 16, 1965, during reactor cycle 40P.

The purpose of the test was to evaluate the performance of Physical Sciences variable reluctance type and Consolidated Electrodynamics Corporation (CEC) strain gage type pressure transducers in a radiation environment. Also two Wiancko variable reluctance pressure transducers were included for determining gamma heating effects.

The preliminary test specifications for this test are available in WANL-TME-1170 (Reference 1). The final test specifications are in WANL-TME-1223 and Modification No. 1 (References 2 and 3).

The design manual and hazards report for this test is WANL-REP-2778 with Addendum I and Revision I (References 4, 5, and 6).

2.0 TEST HISTORY

Six pressure transducers were irradiated in the Plum Brook Reactor at the HT-1 test location. The test was conducted by using the HT-1 charging machine to insert a capsule containing the pressure transducers to various positions near the reactor. With this arrangement the radiation exposure rates were varied as a function of the distance between the reactor core and the capsule.

The reactor power levels during the test are tabulated in Appendix B. The capsule position at various times during the test are listed in Appendix D.

The test was initiated at 1352 hours on November 15, 1965, and continued until 1225 hours on November 16.

3.0 DESCRIPTION OF TEST

3.1 Description of The Transducers Tested

Six pressure transducers were irradiated in the W2-3 facility of the Plum Brook Reactor. They are as follows:

<u>Quantity</u>	<u>Manufacturer</u>	<u>Model No.</u>	<u>Range</u>	<u>IDB Code*</u>
2	Physical Sciences	PT 1015	200 psia	Pr-41
2	Consolidated Electrodynamics	172550	50 psid	DPr-37
2	Wiancko	54726	300 psia	Pr-29 <i>(Pr-18)</i>

3.2 Description of the Test Fixture

A drawing (WANL 577F394) of the test fixture is shown in Figure 1. This fixture is also shown in the photographs (Figures 2, 3, 4) with the aluminum cover removed.

3.3 Test Data

The data sheets for this test are presented in Appendices A, B, C, and D. Six (6) neutron dosimeters were mounted on the test fixture during the tests. They contained aluminum-cobalt wires, both bare and cadmium-covered for thermal and epithermal flux measurements, and sulfur for fast flux measurements. The dosimeter results will be available at a later date.

* NERVA Instrumentation Data Book - Reference 7

FIGURE 2

TEST FIXTURE WITH INLET TUBE AND BACKPLATE

FIGURE 3

PRESSURE TRANSDUCER TEST FIXTURE - SIDE VIEW

FIGURE 4

PRESSURE TRANSDUCER TEST FIXTURE - END VIEW

4.0 REFERENCES

1. WANL-TME-1170, "Preliminary Test Specifications for NRX-A Candidate Pressure Transducers to be Irradiated at the Plum Brook Reactor (23/W508)", May, 1965.
2. WANL-TME-1223, "Final Test Specifications for NRX-A Candidate Pressure Transducers to be Irradiated at the Plum Brook Reactor (23/W508)", July, 1965.
3. WANL-TME-1223, Modification No. 1, October 28, 1965.
4. WANL-REP-2778, "Design Manual and Hazards Analysis for Pressure Transducer Test at Plum Brook Reactor Facility", August, 1965.
5. WANL-REP-2778, Addendum I, October 14, 1965.
6. WANL-REP-2778, Revision I, October 28, 1965.
7. AGC-7168, "NERVA Instrumentation Data Book", Confidential.

APPENDIX A

SYSTEM DATA SHEETS

PRESSURE TRANSDUCER TEST 23/W508

APPENDIX A

SYSTEM J.T. SHUT-KILL-ALARM 63-C5R1 (PRESSURE TRANSDUCER TEST 23/1,503)

Date	Time	Seal Leakage	Deionized Water Inlet Pressure	Seal Pressure	Brake Pressure Denergized	P.H.L. Pressure Denergized	Gas Bottle GHe - psig	Gas Bottle GN ² - psig	Panel Lite Check	Operator Initial
11/15/65	1407	C	80	173	33	0	325	1900	OK	J.Q.
11/15/65	1515	O	85	173	33	0	325	1750	OK	J.Q.
11/15/65	1538	O	80	173	33	0	325	1600	OK	J.Q.
11/15/65	1620	O	80	173	33	0	300	1550	OK	P.M.T.
11/15/65	1715	O	80	173	33	0	300	1370	OK	P.M.T.
11/15/65	1810	O	80	173	33	0	300	1200	OK	P.M.T.
11/15/65	1920	O	80	173	33	0	300	1000	OK	P.M.T.
11/15/65	2010	O	80	173	33	0	295	875	OK	P.M.T.
11/15/65	2108	O	80	173	33	0	300	500	OK	R.L.B.
11/15/65	2200	O	80	173	33	0	300	2100**	OK	R.L.B.
11/15/65	2312	O	80	173	33	0	300	1900	OK	P.M.T.
11/16/65	2400	O	80	173	33	0	700	1700/500	OK	R.A.B.
11/16/65	0100	O	80	173	33	0	650	1500/500	OK	R.A.B.
11/16/65	0200	O	80	173	33	0	625	1400/500	OK	R.A.B.
11/16/65	0300	O	80	170	33	0	500	1200/500	OK	R.A.B.
11/16/65	0400	O	80	170	33	0	450	1000/500	OK	R.A.B.
11/16/65	0500	O	80	170	33	0	400	800/500	OK	R.A.B.
11/16/65	0600	O	80	170	33	0	400	650/2800***	OK	R.A.B.
11/16/65	0700	O	80	170	33	0	1750	650/200	OK	R.A.B.
11/16/65	0800	O	85	170	33	0	1690	275	OK*	L.L.E.
11/16/65	0910	O	85	170	33	0	1510/600	275	OK	L.L.E.
11/16/65	0955	O	84	170	33	0	1400/600	260	OK	L.L.E.
11/16/65	1125	O	84	170	33	0	1000/600	260	OK	J.Q.

* Momentary Low Pressure Alarm on L305 Panel and in XCR when Test Button is Depressed

** Right Hand He Gas Bottle has been Placed in Service - 2100 psig

*** New He Gas Bottle

APPENDIX A
SYSTEM HOURLY DATA SHEET U-2 TRIPLE LOOP PRESSURE TRANSDUCER TEST
23/W508

Date	Time	Inlet Flow FR-1	Outlet Flow FR-2	HT-1 Press. PR-1	Sample Temp. TR-2	Sample Temp. TR-1	Sample Temp. TR-1	HT-1 Inlet Temp. TE-1	HT-1 Outlet Temp. TE-2	Capsule Outlet Temp. TE-3	Capsule Press. PI-1	Reactor Power	Quadrant Check	Initial
11/15/65	1400	86	81.5	162*	125	123	87	118	116	126	145	60 MW	OK	J.Q.
11/15/65	1510	86	81.5	162*	125	125	89	119	118	128	145	60 MW	OK	J.Q.
11/15/65	1535	81	81.5	160*	125	125	88	120	118	127	145	60 MW	OK	J.Q.
11/15/65	1616	86	81	---	125	125.5	88	120.5	118	128	145	60 MW	OK	P.M.T.
11/15/65	1710	86	81.5	160*/145	127	126.5	88.5	121	119	128	145	60 MW	OK	P.M.T.
11/15/65	1805	86	81.5	100*/145	127	127	88.5	122	120	128.5	145	60 MW	OK	P.M.T.
11/15/65	1915	86	81	160*/195	133	128	89	123	121	128	145	60 MW	OK	P.M.T.
11/15/65	2005	86	81.5	160*/145	133	128.5	90	122.5	121	128.5	145	60 MW	OK	P.M.T.
11/15/65	2101	86	81	160*/145	137	128.5	90	122.5	122	128.2	145	60 MW	OK	R.L.B.
11/15/65	2205	86	81	160*/145	140	130	90	122.6	121.1	128.5	145	60 MW	OK	R.L.B.
11/15/65	2308	86	81	160*/145	140	130	91	124	124	129	145	60 MW	OK	P.M.T.
11/16/65	0000	86	81	162	142	131	91	125	124	129	144	60 MW	OK	R.A.B.
11/16/65	0100	85.5	81	162	142	131	92	124	124	129	144	60 MW	OK	P.A.B.
11/16/65	0200	85.5	81	162	142	132	92	125	124	129	144	60 MW	OK	R.A.B.
11/16/65	0300	85.5	81	162	142	132	93	125	124.5	130	144	60 MW	OK	P.A.B.
11/16/65	0400	85.5	81	162	142	133	93	125.5	125.5	130	144	60 MW	OK	R.A.B.
11/16/65	0500	85.5	81	162	143	133	93.5	126	125.5	131	144	60 MW	OK	R.A.B.
11/16/65	0600	85.5	81	162	143	132.5	93.5	125	125	130	144	60 MW	OK	P.A.B.
11/16/65	0700	85.5	81	162	143	132	94	125	125	131	144	60 MW	OK	P.A.B.
11/16/65	0800	85.5	81.5	162	144	134	96	127	128	130	144	60 MW	OK	L.E.E.
11/16/65	0905	86	82.5	162	144	133	95	126	126	130	144	60 MW	OK	J.Q.
11/16/65	0950	86	82	163	144	132	95	126	125	131	145	60 MW	OK	L.E.E.
11/16/65	1120	86	82	163	145	131	95	126	124	133	145	60 MW	OK	J.Q.

* Pressure is giving a false reading--faulty meter.

APPENDIX B

DATA FROM DATA LOGGER

DATA FROM DATA LOGGER - PRESSURE TRANSDUCER TEST

(23/W508)

November 15, 1965

Time Hrs.	Reactor Power MW	Control Rod Height Inches	Temperatures - °F			
			No. 1	No. 2	No. 3	No. 4
0951	59.5	19.37	122	123	122	120
1000	59.1	19.37	120	122	120	122
1100	59.1	19.40	125	127	126	126
1133	59.4	19.40	127	129	123	123
1200	59.5	19.42	125	128	124	125
1300	59.0	19.44	127	124	126	127
1400	58.9	19.50	127	128	125	125
1421	58.9	19.50	129	131	122	123
1500	59.1	19.54	131	131	128	128
1552	59.4	19.54	179	192	132	130
1600	59.4	19.54	182	184	124	124
1700	59.5	19.61	253	269	125	129
1800	59.5	19.61	256	270	133	130
1900	59.6	19.66	256	268	134	126
2000	59.4	19.71	365	394	132	127
2053	59.7	19.71	449	496	145	129
2100	59.7	19.72	442	491	137	134
2200	59.4	19.76	487	540	135	129
2226	59.3	19.82	501	559	138	131
2300	59.6	19.82	501	560	137	130
2400	59.5	19.86	496	560	137	136

DATA FROM DATA LOGGER - PRESSURE TRANSDUCER TEST

(23/1508)

November 16, 1965

Time Hrs.	Reactor Power MW	Control Rod Height Inches	Temperatures - °F			
			No. 1	No. 2	No. 3	No. 4
0100	59.8	19.87	500	562	137	136
0200	60.1	19.87	504	563	139	133
0300	59.6	19.93	499	563	140	132
0400	59.9	19.93	500	564	139	139
0500	59.6	20.02	497	562	144	137
0600	60.0	20.05	492	553	137	134
0653	60.0	20.06	437	490	143	137
0700	60.0	20.06	418	474	144	129
0727	59.8	20.06	415	468	144	136
0800	59.8	20.11	577	641	147	141
0900	60.2	20.13	530	600	148	133
1000	60.2	20.15	390	436	140	138
1100	60.0	20.18	270	289	131	135
1200	59.9	20.19	153	157	135	134
1243	60.1	20.23	134	133	135	136
1300	60.0	20.23	131	134	131	136

APPENDIX C

PRESSURE TRANSDUCER DATA SHEETS

Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65Time 0900Reactor Power 60 MW Temp. Pressure

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	2.50	2.50	5.01	5.0	
40					
80					
120					
160					
200					
0					
AC Exclt.	5.09	5.08	4.94	5.18	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1						
2						
3						
4						

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0			
12.5			
25			
37.5			
50			
0			

	No. 2259	No. 2260
R _{in}		
R _{out}		
IR		

DC Excitation	
No. 2259	No. 2260
9.97	9.07

Comments Fixture in quadrant, water flow established - (*calibrate voltages .Operator R. MuhaPage C 1

Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 10:20

Reactor Power In Quadrant Temp. 125°F Pressure 745 psia

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-1.043	+0.046	-1.079	-5.075	
40	-0.260	-0.682	1.495	5.254	
80	-0.814	-1.290	1.900	5.362	
120	1.439	1.955	2.309	5.459	
160	2.159	2.731	2.784	5.693	
200	2.839	3.454	3.152	5.694	
0	-1.036	+0.047	1.179	5.246	
AC Excit.	5.04	5.06	4.93	5.19	

Cal. Volts 2.55 2.55

	Resistance			Inductance	Capacitance NANO FARAD	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	15.80	15.94	25.47	6.88 mh (1.61)	10.6 (0.011)	100 Ω (1e-)
2	15.71	15.71	25.31	7.02 mh (1.66)	10.5 (0.0093)	>200 Ω (1e-)
3	15.36	15.05	26.85	7.92 mh (0.66)	11.3 (0.0095)	60 Ω (1e-)
4	53.80	5.23	55.00	--	--	hort

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	-0.0001	-0.0001	0.0000
12.5	10.0 μ V	+0.0102	+0.0100
25	+0.0211	+0.0218	0.0203
37.5	1.0326	0.0330	0.0314
50	0.0445	0.0454	0.0434
0	+0.0003	+0.0003	+0.0003

	R _{in}	R _{out}
No. 2259	389.03	366.20
No. 2260	400.45	366.65
IR	>200 K Ω eg	>200 K Ω eg

DC Excitation	
No. 2259	No. 2260
-	-

Comments Base Line Data

Operator R. Muha, R. Naff

Page C 2

Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65Time 1330Reactor Power 60 MW

Temp. _____

Pressure 149 lb psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.88	+0.05	+1.05	+5.2	+0.002
40	+0.22	+0.62	+1.33	+5.2	+0.416
80	+0.767	+1.24	+1.86	+5.92	0.904
120	1.39	1.90	2.23	5.88	1.388
160	2.01	2.55	2.59	5.93	1.848
200	2.649	3.229	2.944	5.939	2.349
0	-0.94	+0.0269	+1.14	+6.6	+0.0007
AC Exclt.	4.55	4.58	4.47	4.70	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1						
2						
3						
4						

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0002	-0.0001	+0.0002
12.5	+0.0089	+0.0087	0.0087
25	+0.0201	+0.0200	0.0199
37.5	+0.0300	0.0300	0.0290
50	0.0405	0.0407	0.0391
0	+0.0003	-0.0002	+0.0002

	No. 2259	No. 2260
R _{in}	389.4	400.76
R _{out}		
IR		

DC Excitation	
No. 2259	No. 2260

Comments Pre Irradiation Check (120 inches)Operator T. P. Weldon, R. MuhaPage C 3

Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 1420

Reactor Power 60 IW

Temp. 125°F

Pressure 145 psia

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.918	+0.030	+1.08	+5.59	0.000
40	+0.2007	0.625	1.42	5.569	0.435
80	0.749	1.22	1.84	5.8	0.896
120	1.404	1.907	2.25	5.9	1.388
160	2.02	2.56	2.60	5.96	1.878
200	2.66	3.25	2.96	5.99	2.365
0	-0.982	+0.052	+1.06	5.49	+0.003
AC Excit.	4.74	4.76	4.63	4.86	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1			25.65			
2			25.47			
3			27.04			
4			51.9			

Pressure	CEC 172550 (Volts)		Standard
	5. No. 2259	6. No. 2260	No. 1
0	+0.0003	-0.0001	+0.0003
12.5	+0.0101	+0.0099	0.0096
25	+0.0202	0.0201	0.0194
37.5	0.0303	0.0304	0.029
50	0.0410	0.0413	0.0394
0	+0.0005	-0.0001	+0.0002

	No. 2259	No. 2260
R _{in}	389.47	401.02
R _{out}	366.56	366.89
IR		

DC Excitation	
No. 2259	No. 2260

Comments 45"

Operator T. P. Weldon, R. Nuha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 1512

Reactor Power 60

Temp.

Pressure 145

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.7299	+0.0139	+1.22	5.92	0.000
40					
80	0.707	1.15	1.80	5.7	0.052
120					
160	1.97	2.49	2.59	6.01	1.878
200	2.58	3.139	2.929	6.019	2.349
0	-0.796	+0.086	+1.09	+5.45	
AC Exclt.	5.06	5.00	4.92	5.15	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1			26.41			1.3 K Meg
2			26.23			570 Meg
3			28.02			28 Meg
4			51.5			Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0017	+0.0017	+0.0001
12.5	0.0130	+0.0128	0.0101
25	+0.0206	0.0210	0.0183
37.5	0.0318	0.0322	0.0290
50	+0.0426	0.0432	0.0394
0	+0.0022	+0.0022	+0.0004

	No. 2259	No. 2260
R _{in}	391.2	403.12
R _{out}	367.7	368.1
IR	10.5 Meg	10.2 Meg

DC Excitation	
No. 2259	No. 2260

Comments Data taken at 30 inches

Operator T. P. Weldon, R. J. Fuha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 1602

Reactor Power 60 MW

Temp. 126°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-1.094	-0.107	11.36	5.30	0.000
40	+0.175	+0.526	1.48	5.14	0.4619
80	0.73	1.13	2.04	5.8	0.9030
120	1.400	1.88	2.46	5.9	1.406
160	2.029	2.539	2.799	5.95	1.870
200	2.659	3.20	3.14	5.97	2.339
0	-1.07	-0.107	+1.26	5.52	-0.000
AC Excit.	4.04	4.65	4.52	4.77	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1			28.28			270 Meg
2			27.97			122 Meg
3			30.57			9.3 Meg
4			52.3			Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0047	+0.0069	-0.0006
12.5	0.0159	+0.0169	+0.0099
25	0.0259	0.0279	0.0200
37.5	0.0369	0.0389	0.0300
50	0.0479	0.0499	0.0400
0	0.0049	0.0069	0.0000

	No. 2259	No. 2260
R _{in}	396.22	408.69
R _{out}	371.03	371.64
IR	4.5 Meg	4.2 Meg

DC Excitation	
No. 2259	No. 2260

Comments Data for 22.01 in. - 25 in. at 1532 hr.

Operator R. J. Muha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 1725

Reactor Power 60 MW

Temp.

Pressure

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-1.12	-3.12	+2.88	+5.50	-0.000
40	+0.190	+0.490	+2.75	+5.069	0.420
80	+0.634	+1.008	3.139	5.38	0.723
120	1.08	1.50	+3.479	5.53	1.209
160	1.84	2.299	3.979	5.72	1.769
200	2.479	2.969	4.349	5.789	2.239
0	-1.25	-0.347	+2.71	+5.44	+0.002
AC Excit.					

	Resistance			Inductance	Capacitance 10 ⁻⁹	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	19.02	18.92	31.75	7.9 mh	10.7 (D=0.013)	30 Meg
2	18.59	18.19	30.51	6.5 mh	10.6 (D=0.014)	39 Meg
3	22.13	19.05	37.64	2.85 mh	11.5 (D=0.045)	4 Meg
4	51.30	5.37	52.50	--	--	Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0129	+0.0179	-0.0008
12.5	0.0209	+0.0259	0.0099
25	0.0329	0.0389	0.0189
37.5	+0.0439	+0.0499	+0.0279
50	0.0569	0.0629	0.0399
0			

	No. 2259	No. 2260
R _{in}	407.58	422.1
R _{out}	378.78	380.15
IR	1.9 Meg Ω	2.1 Meg Ω

DC Excitation	
No. 2259	No. 2260

Comments End of Data Run-1822

Operator T. P. Weldon, R. J. Muha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 1847

Reactor Power 60 MW

Temp. 129°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.487	-0.140	+2.730	+4.709	
40					
80	+0.684	+1.09	3.416	+4.70	0.739
120					
160	2.065	2.54	4.15	+4.702	1.60
200	2.72	3.22	4.49	+4.702	2.00
0	-0.483	-0.136	+2.72	+4.701	
AC Excit.	5.07	5.07	4.94	5.17	

	Resistance			Resistance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1				31.60		28 Meg
2				31.05		37 Meg
3				37.51		3.6 Meg
4				53.3		Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0129	+0.018	
12.5	0.0239	0.0295	0.00915
25	0.034	0.0397	0.0185
37.5	0.0445	0.0503	0.0282
50	0.0557	0.0615	0.0387
0	+0.0129	+0.0184	-0.0012

	No. 2259	No. 2260
R _{in}	407.63	422.10
R _{out}	378.8	380.2
IR	2.0 Meg	1.85 Meg

DC Excitation	
No. 2259	No. 2260
10.00	10.00

Comments Change of DVM- Excitation Voltages adjusted to EI DVM

Operator T. P. Weldon, R.J. Muha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15-65

Time 1950

Reactor Power 60 MW

Temp. 130°F

Pressure 146

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.583	-0.205	1.80	4.69	
40	+0.018	+0.432	+2.1832	+4.698	+0.384
80	+0.587	+1.029	+2.498	+4.69	+0.746
120	+1.05	+1.510	+2.754	+4.69	+1.032
160	1.966	2.465	+3.230	4.69	1.6079
200	2.612	3.136	3.560	4.69	2.0070
0	-0.563	-0.185	+1.81	+4.69	
AC Exclt.	5.060	5.068	4.93	5.17	-0.000

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	22.07	21.72	37.55	7.3		11 Meg
2	21.10	21.4	36.32	6.8		16 Meg
3	23.1	22.8	43.46	1.42		1.7 Meg
4	48.8	5.3	50.5	--		Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	0.0252	0.0367	
12.5	+0.0367	+0.0487	+0.0074
25	+0.0476	+0.0594	+0.0167
37.5	+0.0588	+0.0786	+0.0264
50	+0.0707	+0.0824	+0.036
0	+0.0255	+0.0388	-0.00296

	5 No. 2259	6 No. 2260
R _{in}	429.6	449.3
R _{out}	393.8	397.2
IR	1.0 Meg	0.92 Meg

DC Excitation	
No. 2259	No. 2260
9.9997	10.000

Comments Capsule at 12.5 in. at 1914 hr.

Operator T. P. Weldon

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 2110

Reactor Power 60 MW

Temp. 135

Pressure 146

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-5.85	-0.235	+2.078	+4.69	-0.0015
40	-0.043	+0.336	+2.39	+4.69	+0.3478
80	+0.585	+0.991	+2.74	+4.69	+0.746
120	+1.65	+1.47	+2.98	+4.69	+1.035
160	+1.96	+2.42	+3.44	+4.69	+1.585
200	+2.617	+3.084	+3.760	+4.69	+ 2.005
0	-5.43	-0.215	+2.088	+4.69	-0.0005
AC Excit.	5.060	5.066	4.93	5.16	--

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	24.37	23.80	41.95	2.3 mh		7.8 Meg
2	22.97	23.40	40.24	2.5 mh		12.0 Meg
3	27.21	25.40	49.06	1.8 mh		1.1 Meg
4	53.82	5.37	53.88	--		Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+0.0332	+0.0485	-0.0048
12.5	+0.0464	+0.0614	+0.0059
25	+0.0574	+0.0720	+0.0149
37.5	+0.0695	+0.0838	+0.0245
50	+0.0825	+0.095	+0.035
0	+0.08258	+0.09462	+0.0348

	5 No. 2259	6 No. 2260
R _{in}	447.08	471.23
R _{out}	405.46	410.12
IR	0.7 Meg	0.62 Meg

DC Excitation	
No. 2259	No. 2260
9.999	9.9994

Comments 8.98 inches insertion-2044

Operator R. L. B.

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 2240

Reactor Power 60 MW

Temp. 125°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.411	-0.353	+2.242	+4.693	-0.0009
40	+0.137	+0.2180	+2.543	+4.690	+0.3476
80	+0.7815	+0.8834	+2.887	+4.689	+0.7528
120	+1.250	+1.362	+3.118	+4.688	+1.038
160	+2.153	+2.294	+3.555	+4.688	+1.604
200	+2.817	+2.974	+3.865	+4.688	+2.007
0	-0.352	-0.336	+2.247	+4.688	-0.0009
AC Excit.	5.060	5.058	4.93	5.16	

	Resistance			Inductance	Capacitance ¹⁰⁹	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	26.35	25.34	45.49	6.94 mh (.94)	10.8 (.019)	5.8 Megs
2	24.54	24.85	43.20	7.00 mh (.99)	10.7 (.015)	8.7 Megs
3	29.30	27.23	52.99	2.95 mh (.342)	12.9 (.21)	.705 Meg
4	Open	5.45	Open	---	---	Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.7141	+0.02903	-0.0055
12.5	+4.7197	+0.0396	+0.0038
25	+4.726	+0.0488	+0.0131
37.5	+4.733	+0.0591	+0.0245
50	+4.737	+0.0651	+0.0336
0	+4.712	+0.0229	-0.0063

	No. 2259	No. 2260
R _{in}	920.94	422.77
R _{out}	823.97	414.40
IR	Short	Short

DC Excitation	
No. 2259	No. 2260
10.0	10.0

Comments 5.68 Inches

Operator R. Neff

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0001

Reactor Power 60 MW

Temp. 125°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3895	-0.3869	+2.253	+4.692	-0.0016
40	+0.1486	+0.1840	+2.550	+4.690	+0.3500
80	+0.8020	+0.8595	+2.903	+4.688	+0.7583
120	+1.275	+1.340	+3.134	+4.687	+1.046
160	+2.176	2.263	+3.568	+4.686	+1.605
200	+2.837	+2.932	+3.884	+4.686	2.006
0	-0.3324	-0.3637	+2.255	+4.686	-0.0010
AC Excit.	5.059	5.062	4.939	5.168	

	Resistance			Inductance	Capacitance	Insulation Resistance
	c - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	26.21	25.50	45.46	6.9 mh (.92)	10.8 (.0202)	5.3 Meg
2	24.41	25.03	43.23	7.0 mh (.98)	10.6 (.016)	3.0 Meg
3	29.30	27.16	52.89	2.93 (.34)	12.6 (.24)	0.68 Meg
4	52.74	5.44	53.74	---	---	Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+6.087	+1.637	+1.221
12.5	+6.087	+1.644	+1.233
25	+6.091	+1.660	+1.245
37.5	+6.102	+1.662	+1.243
50	+6.096	+1.660	+1.249
0	+6.088	+1.635	+1.228

	No. 2259	No. 2260
R _{in}	922.25	431.50
R _{out}	823.48	413.17
IR	Short	Short

DC Excitation	
No. 2259	No. 2260
9.998	9.998

Comments 5.68 Inches

Operator R. Neff

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0200

Reactor Power 60 MW

Temp. 125°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3662	-0.3902	+2.266	+4.680	-0.0016
40	+0.1610	+0.1720	+2.566	+4.679	+0.3501
80	+0.7961	+0.8313	+2.912	+4.679	+0.7571
120	+1.252	+1.478	+3.145	+4.679	+1.046
160	+2.139	+2.197	+3.579	+4.679	+1.606
200	+2.788	+2.858	+3.886	+4.679	+2.007
0	-0.3275	-0.3943	+2.266	+4.678	-0.0014
AC Excit.	5.053	5.060	4.932	5.160	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	26.16	25.40	45.27	6.95 mh (9.3)	10.8 (.024)	4.8 Meg
2	24.37	24.95	43.11	7.00 mh (9.6)	10.7 (.019)	7.0 Meg
3	29.26	27.08	52.76	2.93 mh (.34)	12.7 (.25)	.69 Meg
4	52.97	5.42	53.59	---	---	Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+6.148	+1.697	+1.285
12.5	+6.152	+1.706	+1.293
25	+6.155	+1.713	+1.307
37.5	+6.159	+1.719	+1.307
50	+6.162	+1.726	+1.315
0	+6.146	+1.693	+1.285

	No. 2259	No. 2260
R _{in}	921.53	479.24
R _{out}	321.75	410.15
IR	Short	Short

DC Excitation	
No. 2259	No. 2260
9.9992	9.9992

Comments 5.68 Inches

Operator R. Neff

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0400

Reactor Power 60 MW

Temp. 125°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3597	-0.4133	+2.274	+4.675	-0.0017
40	+0.1650	+0.1437	+2.577	+4.675	+0.3498
80	+0.7915	+0.7980	+2.924	+4.674	+0.7572
120	+1.236	+1.268	+3.147	+4.674	+1.045
160	+2.113	+2.178	+3.580	+4.675	+1.603
200	+2.749	+2.836	+3.890	+4.675	+2.006
0	-0.3251	-0.3904	+2.268	+4.675	-0.0016
AC Excit.	5.057	5.062	4.936	5.165	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	26.13	25.37	45.24	6.98 mh (.94)	10.8 (.024)	4.8 Meg
2	24.36	24.91	43.04	7.00 mh (.99)	10.7 (.019)	6.6 Meg
3	29.30	27.12	52.82	2.94 mh (.35)	13.4 (.25)	.65 Meg
4	52.78	5.44	53.38	---	---	Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+6.140	+1.683	+1.283
12.5	+6.145	+1.692	+1.291
25	+6.149	+1.705	+1.299
37.5	+6.153	+1.705	+1.307
50	+6.157	+1.712	+1.315
0	+6.140	+1.681	+1.284

	No. 2259	No. 2260
R _{in}	920.66	477.85
R _{out}	920.64	409.00
IR	Short	Short

DC Excitation	
No. 2259	No. 2260
9.998	9.998

Comments 5.68 Inches

Operator R. Reff

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/15/65

Time 0555

Reactor Power 60 MW

Temp. 125

Pressure 144

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.379	-0.403	+2.275	+4.67	-0.0015
40	+0.148	+0.153	+2.57	+4.6	+0.349
80	+0.765	+0.799	+2.92	+4.673	+0.7515
120	+1.217	+1.269	+3.159	+4.67	+1.047
160	+2.09	+2.173	+3.590	+4.67	+1.606
200	+2.723	+2.819	+3.895	+4.672	+2.005
0	-0.333	-0.377	+2.282	+4.67	+0.0000
AC Excit.	5.055	5.057	4.930	5.162	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	26.29	25.19	45.16	6.9 mh		4.5 Meg
2	24.46	24.67	42.86	7.0 mh		6.6 Meg
3	29.29	27.07	52.72	2.7 mh		0.66 Meg
4	Open	5.45	10 Meg	---		Grounded

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	*4.699 +6.139	*-0.0124 +1.6761	*+0.001
12.5	+4.706	-0.0031	+0.0107
25	+4.711	+0.0051	+0.0198
37.5	+4.715	+0.01244	+0.0295
50	+4.721	+0.0213	+0.0399
0	4.698	-0.0141	+0.00017

*Ungrounded

	No. 2259	No. 2260
R _{in}	917.8	476.4
R _{out}	818.4	407.9
IR	Grounded	Grounded

DC Excitation	
No. 2259	No. 2260
9.998	9.998

Comments Disconnected ground fuse on DVI bringing readings on 5 & 6 from ground reference - 5.68 Inches

Operator

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0715

Reactor Power 60 MW

Temp. 125

Pressure 144

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.445	-0.387	+1.99	+4.67	-0.002
40					
80	+0.696	+0.815	+2.67	-4.67	+0.7568
120					
160	1.99	2.17	3.36	4.67	1.605
200	2.61	2.81	3.67	4.67	2.00
0	-0.419	-0.367	+2.00	4.67	-0.001
AC Excit.					

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1			40.87			5.8 M
2			39.07			8.8 M
3			48.36			0.94 M
4			10 Meg			Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	4.709	-0.0302	-0.0002
12.5			
25	4.719	-0.0256	+0.0197
37.5			
50	4.729	-0.0091	+0.0398
0	4.708	-0.0298	+0.0001

	No. 2259	No. 2260
R _{in}	831 Ω	455.3 Ω
R _{out}	789.8 Ω	394.5 Ω
IR	Short	.66 M

DC Excitation	
No. 2259	No. 2260

Comments Moved out for one data check before going to full in-DVM floating

Operator T. P. Weldon

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0748

Reactor Power 60 MW

Temp. 125

Pressure 144 psia

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-1.173	+2.04	+2.42	+4.65	-0.002
40	-0.594	2.56	2.71	+4.66	+0.3495
80	+0.119	3.21	+3.05	+4.67	-0.757
120	+0.662	+3.63	+3.27	+4.67	1.046
160	+1.67	+4.58	+3.69	+4.67	-1.607
200	2.42	5.23	3.929	+4.67	2.003
0	-1.123	+1.82	+2.42	+4.67	-0.0015
AC Excit.	5.03	5.05	4.93	5.15	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	128.39	27.10	49.19	6.4 mh (.8)		4 Meg
2	26.54	26.87	47.19	6.72 mh (.96)		5.6 M
3	31.24	28.74	56.40	0.295 (.33)		0.5 Meg
4	10 Meg	3.47	10 M	---		Short

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.562	+0.283	0.000
12.5	4.568	+0.288	0.0107
25	+4.567	+0.600	+0.0198
37.5	4.578	+0.323	0.0295
50	+4.57	+0.550	+0.0399
50	-1.066	-0.650	+0.040

0 44.43 -1.03 0.00

	No. 2259	No. 2260
R _{in}	872.3	443.2
R _{out}	822.5	71.06 *
IR	Short	Short

DC Excitation	
No. 2259	No. 2260
10.000	10.000

Comments CEC transducers both failed - DVM Floating

Operator T. P. Weldon

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*Erratic readings

Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0835

Reactor Power 60 MW

Temp. 125

Pressure 144 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-3.36	-0.569	+2.34	+4.68	-0.00018
40	-2.79	-0.011	+2.63	+4.673	+0.3496
80	-2.162	+0.653	+2.974	+4.673	+0.7572
120	-1.687	+1.125	+3.20	+4.673	+1.044
160	-0.640	+2.04	3.625	+4.671	+1.605
200	-0.004	+2.705	+3.93	+4.67	+2.006
0	-3.07	-0.538	+2.34	+4.67	-0.0005
AC Excit.	5.04	5.06	4.94	5.16	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	27.4	28.19	47.23	16.7 mh(Q=.86)	10.8 (D=.034)	3.5 Megs
2	25.4	25.74	44.89	7.05 mh(Q=.95)	10.7 (D=.027)	5.4 Megs *
3	30.4	28.1	54.87	2.94 mh(Q=.39)	13.9 (D=.298)	0.5 Megs*
4	10 Megs	3.47	10 Megs	---	---	Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.44	-1.00	0.000
12.5	+4.438	-2.93	+0.0110
25	+0.443	-2.98	+0.0198
37.5	+4.448	-3.06	+0.0297
50	4.457	-3.45	+0.040
0	+4.45	-3.578	+0.0397

DVM

	5 No. 2259	6 No. 2260
R _{in}	854.2	194.9
R _{out}	805.9	138.0
IR	Shorted	Shorted
IR	550	11.0
DC Excitation		
No. 2259	No. 2260	
9.996	9.996	

Comments DVM ungrounded - 5.68 inches at 0828 hours

Operator R. J. Muha, J. Quinn

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*Erratic

Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 0945

Reactor Power 60 MW

Temp. 143°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3818	-4.88	+1.867	+4.669	-0.0020
40	+0.147	+0.072	+2.183	+4.668	+0.3496
80	+0.767	+0.722	+2.549	4.668	+0.7574
120	+1.211	+1.185	2.794	4.668	+1.046
160	+2.06	+2.077	+3.249	4.668	+1.605
200	+2.693	+2.718	3.569	4.668	+2.007
0	-0.3639	-0.4732	+1.870	+4.668	-0.0016
AC Excit.	5.05	5.06	4.93	5.16	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1			39.60	7 mh (Q=1.0)	10.8 (D=.026)	5.7 Meg
2			37.96	7.0 mh (Q=1.1)	10.7 (D=.02)	9.0 Meg
3			47.05	2.9 mh (Q=0.38)	13.0 (D=0.2)	1.05 Meg
4			Open	---	---	1.03 ohms

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.462	-3.723	+0.0001
12.5	+4.458	-3.745	+0.0109
25	+4.483	-3.742	+0.0198
37.5	4.480	-3.754	+0.0296
50	4.463	-3.761	+0.0399
0	+4.459	-3.756	0.0000

	No. 2259	No. 2260
R _{in}	806.6	316.6
R _{out}	766.6	254.5
IR	412.9 ohms	12.8 ohms

DVM

DC Excitation	
No. 2259	No. 2260
9.998	9.998

Comments DVI ungrounded - Missed 8.9 inches - Bad position indication - 12 in. at 0930 hr

Operator R. J. Luha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 1043

Reactor Power 60 MW

Temp. 139°F

Pressure 145 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.425	-0.395	+1.40	+4.625	-0.002
40	+0.096	+0.157	+1.74	+4.67	+0.349
80	+0.719	+0.808	+2.135	+4.67	+0.756
120	+1.165	+1.274	+2.406	+4.670	+1.045
160	+1.987	+2.127	+2.863	+4.670	+1.536
200	+2.639	+2.817	+3.23	+4.670	+1.998
0	-0.4177	-0.3857	+1.409	+4.669	-0.0021
AC Excit.	5.06	5.06	4.93	5.16	—

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	19.6	19.42	32.85	6.9 mh(Q=1.3)	10.8 (D=.018)	14 Meg
2	19.02	19.16	32.03	7.0 mh(Q=1.3)	10.7 (D=.018)	23 Meg
3	21.09	20.13	37.74	2.93 mh(Q=.48)	12.2 (D=.14)	2.3 Meg
4	>10 Meg	3.47	Open	---	---	1.04 ohms DVT

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.529	-3.942	0.000
12.5	+4.53	-3.93	+0.0108
25	+4.52	-3.94	+0.020
37.5	+4.519	-3.928	+0.0290
50	+4.518	-3.928	+0.0399
50	+4.5188	-3.928	+0.0398
0	+4.5204	-3.932	0.0000

	No. 2259	No. 2260
R _{in}	752.8	284.5
R _{out}	721.4	239.4
IR	384.9 ohm	8.28 ohm

DC Excitation	
No. 2259	No. 2260
9.999	9.999

Comments 17.5 inches at 1026 hours - Data Run over at 1109 Hours

Operator R. J. Muha

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 1123

Reactor Power 60 MW

Temp. 144

Pressure 145

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3895	-0.320	-1.10	+4.675	-0.002
40	-0.1416	+0.2422	-1.453	+4.671	0.349
80	+0.798	+0.893	+1.860	+4.670	-0.7569
120	1.200	1.356	2.133	4.670	1.045
160	2.055	2.257	2.627	4.669	1.606
200	2.662	2.892	2.965	4.669	1.099
0	-0.385	-0.310	1.104	+4.669	-0.0015
AC Excit.	5.06	5.07	4.93	5.16	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	17.7	17.69	29.15	6.88 mh (Q=1.4)	10.8 (D=.014)	40 M Ω
2	17.4	17.50	28.73	7.0 mh (Q=1.49)	10.7 (D=.012)	61 M Ω
3	17.95	17.51	31.90	2.93 mh (Q=.56)	11.9 (D=.08)	5 M Ω
4	10 M	3.47	10 M	---	---	Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.5589	-4.032	0.0000
12.5	+4.567	-4.029	0.0109
25	+4.561	-4.023	0.0198
37.5	4.557	-4.021	0.0295
50	4.557	-4.021	0.0399
0	+4.569	-4.034	0.0000

	No. 2259	No. 2260
R _{in}	720.5	266.3
R _{out}	693.7	227.5
IR *	367.5	5.6

DC Excitation	
No. 2259	No. 2260
9.999	9.999

Comments *Readings taken with Digital V.M. - 22 inches at 1111 hours

Operator R. J. Muha, J. Quinn

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 1205

Reactor Power 60 MW

Temp. 125

Pressure 145

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.3375	-0.2585	+1.167	+4.674	-0.0024
40	+0.1945	+0.3026	+1.527	+4.668	+0.3493
80	+0.812	+0.953	+1.945	+4.667	0.7575
120	+1.253	+1.417	+2.230	+4.666	+1.044
160	+2.108	+2.315	+2.739	+4.665	+1.605
200	+2.716	+2.959	+3.088	4.666	+2.003
0	-0.332	-0.244	+1.172	+4.665	-0.0017
AC Excit.	5.06	5.06	4.93	5.15	

	Resistance			Inductance	Capacitance	Insulation Resistance
	c - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	16.4	16.53	26.77	6.8 mh (Q=1.5)	10.8 (D=.013)	190 M Ω
2	16.3	16.38	26.54	6.95 mh (Q=1.55)	10.7 (D=.011)	300 M Ω
3	16.37	15.84	28.73	2.93mh (Q=.63)	11.5 (D=.032)	20 M Ω
4	Open	Open	Open	---	---	1.040

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.589	-4.074	0.0000
12.5	+4.588	-4.073	+0.0108
25	+4.587	-4.069	+0.0199
37.5	+4.589	-4.072	+0.0296
50	+4.584	-4.073	+0.0399
0	+4.586	-4.079	+0.000

	No. 2259	No. 2260
R _{in}	701.35	255.98
R _{out}	677.45	220.68
IR	357.02 Ω	9.06 Ω

DC Excitation	
No. 2259	No. 2260
9.999	9.999

Comments 30 inches at 1150 hours - end of Run Time 1223 hours

Operator R. J. Muha, J. Quinn

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Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 1406 Hours

Reactor Power 60 MW

Temp. 117°F

Pressure 107 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.2665	-0.1747	+1.431	+4.671	-0.0021
40	+0.274	+0.3899	+1.793	+4.668	+0.3536
80	+0.900	+1.049	+2.213	+4.665	0.7653
120	+1.354	+1.522	+2.504	+4.665	+1.060
160	+2.185	+2.398	+3.001	+4.664	+1.603
200	+2.802	+3.048	+3.360	+4.663	-2.002
0	-0.2606	-0.1561	+1.432	+4.664	-0.0025
AC Excit.	5.06	5.06	4.93	5.16	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	15.39	15.42	24.72	6.8 mh (Q=1.64)	10.7 (D=.01)	4 K Meg
2	15.36	15.34	24.63	6.9 mh (Q=1.69)	10.6 (D=.01)	7.8 K Meg
3	15.97	14.74	27.14	2.93 mh (Q=.66)	11.5 (D=.012)	2.00 Meg
4	>10 Meg	3.42	>10 Meg	---	---	1.03 ohm

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.734	-4.234	+0.0002
12.5	+4.735	-4.230	+0.0109
25	+4.735	-4.227	+0.0198
37.5	+4.735	-4.225	+0.0296
50	+4.735	-4.224	+0.0400
0	+4.734	-4.235	+0.0000

	No. 2259	No. 2260
R _{in}	690.9	249.85
R _{out}	668.7	216.9
IR	351.35	64.8 *

DC Excitation	
No. 2259	No. 2260
9.999	9.999

Comments DVM ungrounded-120 inches at 1235 hours.-Counter shows 116.45 inches at seal

Operator R.J. Muha

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* Irratic

Pressure Transducer Data

PBRF Test 23/W508

Date 11/16/65

Time 1510

Reactor Power 60 MW

Temp. 107°F

Pressure 108 psig

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard
	DC Output (Volts)		DC Output (Volts)		No. 2
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.201	-0.156	+1.43	+4.66	-0.002
40	+0.275	+0.402	+1.790	+4.66	0.3535
80	+0.905	+1.06	+2.210	+4.66	+0.7654
120	1.358	1.533	+2.504	+4.66	1.0614
160	2.188	2.403	+3.000	+4.66	1.604
200	+2.807	3.050	3.358	+4.66	2.001
0	-2.579	-0.1492	+1.43	+4.66	-0.0019
AC Excit.	5.08	5.09	4.93	5.18	

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c	a - c	a-b-c - case	a-b-c - case
1	15.23	15.28	24.48			4.6 K Meg
2	15.17	15.16	24.32			8.6 K Meg
3	15.73	14.54	26.75			250 Meg
4	>10 Meg	3.42	>10 Meg			Shorted

Pressure	CEC 172550 (Volts)		Standard No. 1
	5. No. 2259	6. No. 2260	
0	+4.73	-4.23	0.00000
12.5			0.01097
25			0.01987
37.5			0.02961
50			0.0400
0	+4.73	-4.237	+0.0000

	No. 2259	No. 2260
R _{in}	688.9	248.8
R _{out}	667.3	216.50
IR	Shorted	Shorted

DC Excitation	
No. 2259	No. 2260

Comments 120"

Operator R. J. Muha, T. P. Weldon

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PBRF Test 23/W508

Date 11/16/65

Time 1550

Reactor Power 60 MW Temp. Pressure

Pressure	Wiancko 54726		Physical Sciences PT1015		Standard No. 2
	DC Output (Volts)		DC Output (Volts)		
	1. No. 115	2. No. 116	3. No. 358	4. No. 352	
0	-0.737	-0.417	+1.43	+4.33	-0.0049
40					
80					
120					
160					
200					
0	4.80	4.826	4.72	4.97	
AC Excit.					

	Resistance			Inductance	Capacitance	Insulation Resistance
	a - b	b - c	a - c			
1						
2						
3						
4						

Pressure	CEC 172550 (Volts)		Standard
	5. No. 2259	6. No. 2260	
0	+5.70	-10.640	
12.5			
25			
37.5			
50			
0			

	No. 2259	No. 2260
R _{in}		
R _{out}		
IR		

DC Excitation	
No. 2259	No. 2260
+9.771	+9.819

Comments (Defective DVM) Test Conditions Same as previous page

Operator Page C25

APPENDIX D

CAPSULE MOVEMENTS DURING PRESSURE TRANSDUCER IRRADIATION TEST

APPENDIX D

CAPSULE MOVEMENTS DURING PRESSURE TRANSDUCER IRRADIATION TEST

23/ 508

Date	Start Time	Stop Time	Start* Position	Stop* Position
11/15/65	1352	1401	120 in.	40 in.
11/15/65	1452	1453	45	40
11/15/65	1457	1458	40	35
11/15/65	1505	1506	35	30
11/15/65	1631	1632	30	25
11/15/65	----	----	25	22.5
11/15/65	1645	1646	22.5	17.5
11/15/65	1913	1914	17.5	12.5
11/15/65	2036	2036.5	12.5	10.0
11/15/65	2044	2044.5	10.0	8.98
11/15/65	2153	2154	8.98	6.78
11/15/65	2210	2210.1	6.78	5.68
11/16/65	0653	----	5.68	5.0
11/16/65	0734	----	9.00	0.0
11/16/65	0828	0829	0.0	5.68
11/16/65	0930	—	5.68	12.5
11/16/65	1025	1026	12.5	17.5
11/16/65	1113	1114	17.5	21.94
11/16/65	1226	1235	21.94	120.0

* Position is distance from vertical fixture centerline to core centerline.