TMI DOCUMENTS

DOCUMENT NO: TM-0234

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_____

Wilda R. Mullinix, NRC

7906150096

204 086

THREE MILE ISLAND UNIT II
TWG

RADIATION MONITORING SYSTEM TEST

(Liquid)

NUMBER TP 360/1B

MTX 123.3

CATEGORY A

DRAFT Rev. 0

PREPARED: Cognizant Engineer [signature] Date 2/4/77

APPROVED: Lead Engineer [signature] Date 5-24-77

APPROVED: Technical Engineer [signature] Date 6/21/77

PRELIMINARY REVIEW MEETING: Date N.A. MINUTES OF MEETING NUMBER N.A.

TWG APPROVAL FOR PERFORMANCE:

GPU TWG Representative [signature] Date 7/1/77

Met-Ed TWG Representative [signature] Date 7-14-77

NSSS TWG Representative [signature] Date 7-14-77

A-E TWG Representative [signature] Date 7-14-77

TEST RESULTS: Acceptable with the following test exceptions and deficiencies-
E/D 1 thru 30

Technical Engineer Carl E. Datto Date 6/16/78

TWG APPROVAL OF TEST RESULTS:

GPU TWG Representative Carl E. Datto Date 7/14/78

Met-Ed TWG Representative [signature] Date 7/14/78

NSSS TWG Representative [signature] Date 7/14/78

A-E TWG Representative [signature] Date 7/14/78

ENCLOSURES: 1. Test Exception and Deficiency List
2. Table #1, #2, #3 and Figure 1 thru 6.

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TMI UNIT II
TP 360/13

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1.0 PURPOSE

1.1 Verify that button source calibration of detectors and log ratemeters are in accordance with manufacturer's calibration data.

1.2 Verify power supply and r. . meter voltages.

1.3 Set and verify setpoints and alarms.

1.4 Perform functional test of each channel and verify proper operation of:

1.4.1 Interlocks with other systems

1.4.2 Local and control panel operation, indication and alarm status, (visual and audible).

1.4.3 Annunciator panel status

1.4.4 Liquid flow rate and indication

1.5 Verify calibration of recorders.

2.0 REFERENCES

2.1 Drawings

2.1.1 Victoreen

Drawing No.	Description
(1) 904148, Sh.1 Rev. D	System Diagram
(2) 904889, Sh.1 Rev. B	System wiring liquid monitor channel MU-R-720-L1
(3) 904889, Sh.2 Rev. B	System wiring liquid monitor channel MU-R-720-L1
(4) 905222, Sh.1 Rev. 0	Liquid monitors WT-R-3894 and 3895
(5) 905222, Sh.2 Rev. 0	Liquid monitors WT-R-3894 and 3895
(6) 905222, Sh.3 Rev. A	Liquid monitors WT-R-3894 and 3895
(7) 905222, Sh.4 Rev. 0	Liquid monitors WT-R-3894 and 3895
(8) 905222, Sh.5 Rev. A	Liquid monitors WT-R-3894 and 3895
(9) 905222, Sh.6 Rev. 0	Liquid monitors WT-R-3894 and 3895
(10) 905231, Sh.1 Rev. A	Hi Radiation Alarm Control Logic Chart

2.1.2 Burns and Roe

Drawing No.	Description
E-1 (1) 3009 Rev. ~~9~~ 11	Vital Power Supply System and Regulated Voltage System.
(2) 3077 Sh. 45, Rev. 4	Elementary Diagram Radiation Monitoring Interlocks.

2.0 REFERENCES (Cont'd.)

2.1.2 (cont'd.)

Drawing No.	Description
(3) 3077 Sh. 49, Rev. 6	Misc. Ed. Solenoid valves WDL-V99 and WDL-V100.
(4) 3090 Sh. 80, Rev. 1	I&C Sch. Radiation Monitoring Off-Line
(5) 3090 Sh. 80A, Rev. 1	I&C Sch. Radiation Monitoring Off-Line (Logic)
(6) 3090 Sh. 81, Rev. 1	I&C Sch. Radiation Monitoring Off-Line
(7) 3090 Sh. 81A, Rev. 1	I&C Sch. Radiation Monitoring Off-Line (Logic)
(8) 3347 Sh. 1, Rev. 1	External Connections for Panel 12
(9) 3347 Sh. 3, Rev. 3	External Connections for Panel 12
(10) 3347 Sh. 4, Rev. 1	External Connections for Panel 12
(11) 3347 Sh. 8, Rev. 1	External Connections for Panel 12
(12) 3347 Sh. 8A, Rev. 1	External Connections for Panel 12
(13) 3347 Sh. 8B, Rev. 1	External Connections for Panel 12
(14) 3347 Sh. 8C, Rev. 1	External Connections for Panel 12
(15) 3347 Sh. 8D, Rev. 1	External Connections for Panel 12
(16) 3347 Sh. 8E, Rev. 1	External Connections for Panel 12
(17) 3347 Sh. 8F, Rev. 1	External Connections for Panel 12
(18) 3347 Sh. 8G, Rev. 1	External Connections for Panel 12
(19) 3347 Sh. 8H, Rev. 1	External Connections for Panel 12
(20) 3347 Sh. 8J, Rev. 1	External Connections for Panel 12
E-1 (21) 3347 Sh. 8K, Rev. ~~1~~ 2	External Connections for Panel 12

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2.0 REFERENCES (Cont'd.)

2.1.2 (cont'd.)

	Drawing No.		Description
	(22)	3043, Sh. 17F, Rev.3	Liquid Monitor WT-R-3894
	(23)	3043, Sh. 17G, Rev. 3	Liquid Monitor WT-R-3895
E-1	(24)	3043, Sh.17A, Rev. ~~1~~ 2	Extn. Conns. for Liquid Monitors MU-R-720 & IC-R-1091.
E-1	(25)	3043, Sh.17B, Rev. ~~2~~ 3	Extn. Conns. for Liquid Monitors IC-R-1092 and WDL-R-1311.
E-1	(26)	3043, Sh.17C, Rev. ~~1~~ 2	Extn. Conns. for Liquid Monitors IC-R-1093 and DC-R-3399.
E-1	(27)	3043, Sh.17D, Rev. ~~1~~ 2	Extn. Conns. for Liquid Monitors DC-R-3400 and NS-R-3401
E-1	(28)	3043, Sh.17E, Rev. ~~1~~ 2	Extn. Connections for Liquid Monitors SF-R-3402
E-1	(29)	2024, Rev. ~~18~~ 21	Reactor Coolant Make-Up and Purification.
E-1	(30)	2029, Rev. ~~24~~ 25	Intermediate Closed Cooling Water
E-1	(31)	2027, Rev. ~~19~~ 20	Radwaste Disposal Reactor Coolant Liquid
E-1	(32)	2035, Rev. ~~18~~ 18	Decay Heat Closed Cooling Water
E-1	(33)	2026, Rev. ~~23~~ 25	Spent Fuel Cooling and Decay Heat Removal
E-1	(34)	2006, Rev. ~~17~~ 19	Make-Up Water Treatment and Condensate Polishing.

2.2 Manufacturer's Instruction Manuals

2.2.1 Victoreen Instrument Division - Operating Instructions for Radiation Monitoring Systems - B&R Spec. 65.

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2.0 REFERENCES (Cont'd.)

2.3 FSAR

2.3.1 Appendix 14A - 57/58 (dated 12-19-74).

2.4 Met-Ed Operating Procedures

2.4.1 2105-1.12 Radiation Monitoring System Setpoints.

2.4.2 2105-1.8 Radiation Monitoring.

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3.0 TIME REQUIRED

3.1 1 shift, 4 weeks, 2 men.

204 095

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4.0 PREREQUISITES

4.1 Tests

The following test have been completed sufficiently to support performance of this test procedure:

TP 250/2 "Testing and checking of mechanical & electrical equipment.

E-2 Signature John A. Bussman Date 3/12/78

4.2 Construction Completion Status

4.2.1 Met-Ed has accepted the system for preoperational testing.

E-2 Signature John A. Bussman Date 3/12/78

4.2.2 Construction sufficiently completed for the following areas where liquid radiation monitors are installed.

a) Primary Coolant Letdown - MU-R-720.

E-2 Signature J Bussman Date 3-12/78

b) Intermediate Cooling Water Letdown Cooler MU-C-1B - IC-R-1091.

E-2 Signature John A. Bussman Date 3/12/78

c) Intermediate Cooling Water Letdown Cooler MU-C-1A - IC-R-1092.

E-2 Signature John A. Bussman Date 3/12/78

E-2 d) Intermediate Cooling Water Cooler Outlet-IC-R-1093.

Signature John A. Bussman Date 1/30/78

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4.0 PREREQUISITES (Cont'd.)

4.2.2 (cont'd.)

E-2 e) Liquid Effluent Line-WDL-R-1311.

Signature John A. Brumme Date 1/30/78

E-2 f) Decay Heat Closed Cooling Water Loop A DC-R-3399.

Signature John A. Brumme Date 1/30/78

E-2 g) Decay Heat Closed Cooling Water Loop B DC-R-3400.

Signature John A. Brumme Date 1/30/78

E-2 h) Nuclear Services Closed Cooling Water NS-R-3401.

Signature John A. Brumme Date 2/2/78

E-2 i) Spent Fuel Cooling Water System - SF-R-3402.

Signature John A. Brumme Date 3/12/78

E-2 j) Water Treatment and Condensate Polishing WT-R-3894.

Signature John A. Brumme Date 3/12/78

E-2 k) Water Treatment and Condensate Polishing WT-R-3395.

Signature John A. Brumme Date 3/12/78

4.3 Environmental Conditions

4.3.1 No special environmental conditions required for this test.

Signature John A. Brumme Date 9/16/77

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5.0 TEST EQUIPMENT

5.1 MTE 6 - Digital Voltmeter, Fluke Model 8100A or equivalent.

5.2 MTE 19A - Oscilloscope Tektronix 454A or equivalent.

5.3 MTE 41A - Pulse Generator (Hewlett-Packard Model 8005A or equivalent).

5.4 MTE 94V - Scaler Probe (modified).

5.5 MTE 123 - Scaler (Hewlett-Packard Model 5325B or equivalent).

5.6 MTE (unknown) - TMI I Standard Calibration Fixture.

5.7 MTE 257 - Victoreen Calibrated Sources. Unit #2, 133 Ba (No.177), 137 Cs, (No. 177), 0.0041 µCi 133 Ba (S/N I), 0.115 µCi 133 Ba (S/N A), CO-60 (G-1002).

5.8 MTE (unknown) - Victoreen Calibrated Sources Unit #1-2, 133 Ba (No. 192) 137 Cs (No. 192).

5.9 MTE 257 - Victoreen Calibrated Sources. Unit #1, 133 Ba (No.138), 137 CS (No. 138), 0.0041 µCi 133 Ba (1CN# 0.0041), 0.0984 µCi 133 Ba (1CN #, 1129), 6.455 µCi 133 Ba (1CN #5.43).

6.0 LIMITATIONS AND PRECAUTIONS

6.1 Exercise care in handling detectors to prevent damage to:

(1) Photomultiplier Tubes and Geiger Mueller (GM) tube.

(2) Preamplifie

(3) Connectors

6.2 Care in handling sources:

Utilize standard Health Physics procedures in handling radioactive test sources.

6.3 Follow standard safety practices when working with power supplies which produce high internal and external voltages (0 to 2500 volts).

7.0 PLANT STATUS

7.1 The following systems must be operational for performance of section 9.8 of the procedure.

7.1.1 The Makeup and Purification System.

E-3

Signature_____ Date_____

7.1.2 The Intermediate Closed Cooling System.

E-3

Signature_____ Date_____

7.1.3 The Radioactive Liquid Waste Disposal System.

E-3

Signature John A. Brunner Date 1/28/78

7.1.4 The Decay Heat Closed Cooling System.

E-3

Signature_____ Date_____

7.1.5 The Nuclear Services Closed Cooling Water System.

E-3

Signature_____ Date_____

7.1.6 The Spent Fuel Cooling System.

E-3

Signature_____ Date_____

7.1.7 The Condensate Polishing System.

E-3

Signature_____ Date_____

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8.0 PREREQUISITE SYSTEM CONDITIONS

E-4 8.1 The Radiation Monitoring System Alarm on Panel 12 in the Control Room must be operable.

Signature John A. Brunner Date 1/26/78

8.2 Ratemeter function selector switches are in the "Off" position. See Enclosure 2 figure 1.

Cah MU-R-720 (Gross) Signature John A. Brunner Date 9/23/77

Cah MU-R-720 (Iodine) Signature John A. Brunner Date 9/23/77

Cah IC-R-1091 Signature John A. Brunner Date 9/23/77

Cah IC-R-1092 Signature John A. Brunner Date 9/23/77

Cah IC-R-1093 Signature John A. Brunner Date 9/23/77

Cah WDL-R-1311 Signature John A. Brunner Date 9/23/77

Cah DC-R-3399 Signature John A. Brunner Date 9/23/77

Cah DC-R-3400 Signature John A. Brunner Date 9/23/77

Cah NS-R-3401 Signature John A. Brunner Date 9/23/77

Cah SF-R-3402 Signature John A. Brunner Date 9/23/77

WT-R-3894 Signature John A. Brunner Date 3/12/78

Cah WT-R-3895 Signature John A. Brunner Date 9/23/77

NOTE: The ratemeters for WT-R-3894 & WT-R-3895 are located locally at the Condensate Polishing Regeneration Station 281' elevation of the Turbine Building.

E-5 8.3 All liquid radiation detectors and local alarm units must be in their proper location. Complete Data Sheet No.10.1 in the following manner:

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8.0 PREREQUISITE SYSTEM CONDITIONS (Cont'd.)

E-2 8.3.1 Verify model number for each detector.

Signature John A. Brummer Date 2/5/78

8.3.2 Check the appropriate column for verification of cable

E-2 security, i.e. each cable is properly connected and terminated at the local monitor.

Signature John A. Brummer Date 3/5/78

8.4 Insure Regulated Voltage Power Supply 2-12R is in service and the following breakers are closed:

	Breaker	Supply
E-2	14	IC-R-1091
	16	IC-R-1092
	18	WDL-R-1311
	19	WT-R-3894
	20	MU-R-720
	21	WT-R-3895
	22	Panel 12

Signature John A Brummer Date 2/12/78

8.5 Turn the Radiation Monitoring interlock "bypass" switch located

E-5 on the Panel 12 for WDL-R-1311 to the "defeat" position.

Signature John A. Brummer Date 1/28/78

8.6 Verify that Plant Status is as per section 7 or if the systems are

E-3

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8.0 PREREQUISITE SYSTEM CONDITIONS (Cont'd.)

8.6 (cont'd.)

not operable, isolate samplers at respective system valving, flush and fill with demineralized water.

MU-R-720 Signature John Brumm Date 3/12/78

IC-R-1091 Signature John Brumm Date 3/12/78

E-20 IC-R-1092 Signature John Brumm Date 3/12/78

IC-R-1093 Signature John Brumm Date 3/12/78

WX-R-1311 Signature J B Brumm Date 1/24/78

DC-R-3399 Signature J B Brumm Date 3/12/78

DC-R-3400 Signature J B Brumm Date 3/12/78

NS-R-3401 Signature J B Brumm Date 3/12/78

SF-R-3402 Signature J B Brumm Date 3/12/78

WT-R-3894 Signature J B Brumm Date 3/12/78

WT-R-3895 Signature J B Brumm Date 3/12/78

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9.0 TEST METHOD

9.1 Power Supply Voltage Checks.

NOTE: All liquid radiation log ratemeters and recorders are mounted on Panel 12, except for WT-R-3894 and WT-R-3895 which are located on the 286' elevation of the Turbine Building near the Condensate Polisher Regeneration Skid.

9.1.1 Apply power to the liquid radiation ratemeters by rotating the function selector switch to the "Oper" position. Refer to Enclosure 2, Fig. No. 1. With power applied to ratemeter and function selector switch in the "Oper" position, the ratemeter pointer should indicate some deflection.

9.1.2 Adjust "alert" and "high" setpoints just beyond full scale for each ratemeter as follows:

9.1.2.1 "Alert" setpoint. With the ratemeter function selector switch in "cal." position, depress and hold "alert" pushbutton and adjust R214 (See Enclosure 2, Fig. 2) which is located on the ratemeter alarm circuit board.

CAUTION: HIGH VOLTAGE IS PRESENT ON THE TOP AND BOTTOM OF THE MAIN CIRCUIT BOARD.

9.1.2.2 "High" setpoint. With the ratemeter function selector switch in "cal." position, depress and

9.0 TEST METHOD (Cont'd.)

9.1.2.2 (cont'd.)

hold "high" pushbutton, and adjust R205 located on ratemeter alarm circuit board. Return the function selector switch to the "Oper." position.

9.1.3 Record the following voltages for each ratemeter on Data Sheet 10.1. Reference Enclosure 2, Figs. 2 & 3 for:

Voltage	TB (Test Points)	Nominal Volts
a. Supply voltage	2 (line/Neut)	120 VAC
b. Reg. Supply	1 (+16V/Gnd)	+16 VDC
c. Reg. Supply	Power Supply Board/ (junct.R104,CR106 & Gnd)	-6.2 VDC
d. Unreg. Supply	Power Supply Board/ (R107,C106 junct.& Gnd)	+22 VDC

9.1.4 Place the function selector switch in the "h.v." position. And record the high voltage indication on Data Sheet 10.1.

NOTE: If adjustment of the high voltage is required, see the manufacturer's calibration & maintenance procedure.

9.1.5 TURN the ratemeter function selector to "Off".

Section 9.1 Accomplished for MI-R-720 Gross Sat. ✓ Unsat. _____

Signature John A. Bynum Date 2/11/78

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9.0 TEST METHOD (Cont'd.)

REW Section 9.1 Accomplished for MU-R-720 Iodine Sat. ✓ Unsat. ___

Signature John A. Brunner Date 2/6/78

REW Section 9.1 Accomplished for IC-R-1091 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 2/6/78

REW Section 9.1 Accomplished for IC-R-1092 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 2/12/78

REW Section 9.1 Accomplished for IC-R-1093 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 12/7/77

Section 9.1 Accomplished for WDL-R-1311 Sat. ✓ Unsat. ___

REW Signature John A. Brunner Date 1/6/78

REW Section 9.1 Accomplished for ST-R-3300 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 12/6/77

REW Section 9.1 Accomplished for DC-R-3400 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 12/7/77

REW Section 9.1 Accomplished for NS-R-3401 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 2/10/78

REW Section 9.1 Accomplished for ST-R-3402 Sat. ✓ Unsat. ___

Signature John A. Brunner Date 2/28/78

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9.0 TEST METHOD (Cont'd.)

Section 9.1 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/6/78

Section 9.1 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/6/78

9.2 Alarm System Checkout

NOTE: The power fail alarm system for liquid radiation channels MU-R-720 (Gross & Iodine) thru WT-R-3895 is tested by interrupting the electrical circuit which provides +16 volt power to the detectors. This is accomplished by opening the sliding link on the terminal block sufficiently to break the electrical circuit. These terminal blocks are located in Enclosure 2, Table No. 1. Acknowledge all control room alarms as necessary.

NOTE: Turn each monitor "ON" as required during checkout by placing the selector switch to "Oper.". All monitors not in use will be turned off.

9.2.1 Power Fail Alarm Test (Panel 12 Ratemeters).

9.2.1.1 Break the electrical circuit for the channel under test by opening the sliding link for the channel under test as listed in Enclosure 2, Table No.1.

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9.0 TEST METHOD (Cont'd.)

9.2.1.2 Verify the green "fail" lamp is extinguished on ratemeter for the channel under test on Panel 12, and the Panel 12 "Radiation Monitoring System Trouble" Annunciator window alarm also.

9.2.1.3 Return the sliding link, as opened in Step 9.2.1.1 to its normal position and secure with screw.

9.2.1.4 Verify that the "fail" lamp is now illuminated on the ratemeter for the channel under test and record the operational status of the "fail" lamp on Panel 12 and the annunciator alarm on Data Sheet 10.2.

NOTE: The ratemeters for WT-R-3894 and 3895 are mounted locally in cabinets on the 286' elevation of the Turbine Building, near the Condensate Polisher Regeneration Skid.

9.2.2 Power Fail Alarm Test (Local Monitors).

9.2.2.1 Break the electrical circuit for the channel under test by disconnecting the +16 volt supply from the ratemeter.

9.2.2.2 Verify locally that the green "fail" lamp is extinguished on the ratemeter and the horn and red alarm light actuate.

9.0 TEST METHOD (Cont'd.)

9.2.2.3 Also verify on Panel 12 that the "Radiation Monitoring System Trouble" annunciator alarms, and the RED light denoting "Liquid Monitor (under test) trouble/Hi Rad." is lit.

9.2.2.4 Replace the disconnected wire on the ratemeter that was removed in step 9.2.2.1.

9.2.2.5 Verify that the "fail" lamp on the ratemeter is now lit and all local and Panel 12 alarms are reset. Record the operational status of the "fail" lamp and local/Panel 12 alarms on Data Sheet 10.2.

Section 9.2 Accomplished for MU-R-720 Gross Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/2/78

REW Section 9.2 Accomplished for MU-R-720 Iodine Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/1/78

REW Section 9.2 Accomplished for IC-R-1091 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 2/6/78

REW Section 9.2 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 2/12/78

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9.0 TEST METHOD (Cont'd.)

TSW Section 9.2 Accomplished for ICC-R-1093 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/7/77

TSW Section 9.2 Accomplished for WDL-R-1311 Sat. ✓ Unsat. 1/6/78

Signature John A. Brummer Date 1/26/78

TSW Section 9.2 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/6/77

TSW Section 9.2 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/7/77

KEW Section 9.2 Accomplished for NS-R-3401 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/10/78

TSW Section 9.2 Accomplished for ST-R-3402 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/10/78

Section 9.2 Accomplished for WT-R-3894 Sat. ! Unsat. _____

9/81 Signature John A. Brummer Date 3/6/78

Section 9.2 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 3/6/78

9.3 Recorder Calibration

9.3.1 Panel 12 Recorder HP-UR-3264.

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9.0 TEST METHOD (Cont'd.)

9.3.1.1 Open the front of the chart recorder. Insure that the proper paper is installed, and record on the paper the purpose of the test, date, test performer's initials. Place the power switch to ON.

9.3.1.2 Calibrate recorders in accordance with Manufacturers instructions in Reference 2.2.1. Record all pertinent data on Data Sheet 10.3.

9.3.2 Local Recorder WT-UR-3894 & WT-UR-3895.

9.3.2.1 Open the front of the chart recorder. Insure that the proper paper is installed and record on the paper, the purpose of the test, date, test performer's initials. Place the power switch to ON.

9.3.2.2 Calibrate recorders in accordance with Manufacturer's instructions in Reference 2.2.1. Record all pertinent data on data sheet 10.3.

TSW, Section 9.3 Accomplished for HP-UR-3264 Sat. ✓ Unsat. _____

Signature [signature] Date 3/12/78

Section 9.3 Accomplished for WT-UR-3894 Sat. ✓ Unsat. _____

Signature [signature] Date 3/12/78

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9.0 TEST METHOD (Cont'd.)

Section 9.3 Accomplished for WT-UR-3895 Sat. ✓ Unsat. _____

Signature J. Brummer Date 3/2/78

9.4 Ratemeter Calibration

9.4.1 Calibrate the 0-~~10~~ 1V ~~MV~~ recorder output for all ratemeters per manufacturers instruction manual, Reference 2.2.1. Insure Panel 12 ratemeter, ratemeter output and local ratemeter (WDL-R-1311 only) are in agreement. Record pertinent data on Data Sheet 10.4.

E-16

Section 9.4 Accomplished for MU-R-720 (Gross) Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/2/78

REW Section 9.4 Accomplished for MU-R-720 (Iodine) Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/2/78

REW Section 9.4 Accomplished for IC-R-1091 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/10/78

TJW Section 9.4 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/7/77

Section 9.4 Accomplished for IC-R-1093 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 8 Jan. 78

TJW Section 9.4 Accomplished for WDL-R-1311 Sat. ✓ Unsat. _____

E-13 Signature John A. Brummer Date 1/24/78

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9.0 TEST METHOD (Cont'd.)

TJW Section 9.4 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 12-6-77

TJW Section 9.4 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 12/7/77

RELL Section 9.4 Accomplished for NS-R-3401 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 2/10/78

DW Section 9.4 Accomplished for SF-R-3402 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 3/1/78

Section 9.4 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 3/21/78

Section 9.4 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 3/6/78

9.5 Electrical Linearity & Recorder Tracking

9.5.1 Disconnect the cable from the detector at the pre-amplifier junction box.

9.5.2 Using the pulse generator, provide a signal (negative pulse, 0 volts, 100 PPS, 1.0 µS width) to input of ratemeter at Panel 12 by connecting the generator "Hot" lead to "Sig." and the ground lead to the rate-

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9.0 TEST METHOD (Cont'd.)

9.5.2 (cont'd.)

meter chassis. Increase the pulse generator output until a count rate is indicated on the ratemeter.

9.5.3 Set the pulse generator repetition rate at 1 pps. Verify this countrate using the scaler. Connect the input of the scaler to positive output of pulse generator output switch in "SEP" position. Read the indicated countrate on the ratemeter and record on Data Sheet 10.5.

9.5.4 Repeat step 9.5.3 for pulse repetition rates of 10, 10^2, 10^3 and 10^4 pps. Verify these countrates on the scaler. Record all corresponding ratemeter countrates on Data Sheet 10.5.

9.5.5 Transfer the data recorded in steps 9.5.3 and 9.5.4 to the graph provided on Data Sheet 10.5. Verify that a linear relationship exists between pulse rate (pps) and countrate (CPM).

NOTE: If plot is not linear within the upper and lower limits established on the graph, alignment procedure must be performed in accordance with manufacturer's instructions, Reference 2.2.1.

9.5.6 Reset the pulse generator to zero PPS.

9.0 TEST METHOD (Cont'd.)

9.5.7 Record alarm status for Alert and High alarms, "Before Alarm" on Data Sheet 10.5.

9.5.8 With function selector switch in the "Cal." position, depress and hold the "Alert" pushbutton and adjust potentiometer R214 until a reading of 6×10^4 CPM is indicated on the ratemeter.

9.5.9 In a similar manner, depress and hold the "High" pushbutton and adjust potentiometer R205 until a reading of 60 CPM is indicated on the ratemeter. Set the function selector switch to the "Oper." position.

9.5.10 Slowly increase pulse repetition rate until the "High" alarm activates. Record the ratemeter value and alarm status "After High Alarm" on Data Sheet 10.5.

9.5.11 Continue to increase pulse repetition rate until "Alert" alarm activates. Record the ratemeter value and alarm status "After Alert Alarm" on Data Sheet 10.5.

9.5.12 Depress "Reset" pushbutton on the front of the ratemeter and clear the main annunciator alarms as necessary. Record the alarm status "After Reset" on Data Sheet 10.5.

9.5.13 Set the pulse repetition rate to 10^4 PPS. Verify this

9.0 TEST METHOD (Cont'd.)

9.5.13 (cont'd.)

count rate with the scaler. Connect the input of the scaler to the positive output of the pulse generator-output switch in "Sep." position.

9.5.14 Record the following on Data Sheet 10.5.14.

1) Radiation reading for correct recorder channel
2) Recorder radiation printout
3) Panel 12 & Local ratemeter indication reaching
4) Remote radiation indication reading (WDL-R-1311 only).

NOTE: Each of the previous simulated radiation readings must agree at $6 \times 10^5 \pm 1 \times 10^5$ CPM.

9.5.15 Reduce pulse generator repetition rate below "Alert" alarm setpoint and press the "Reset" pushbutton on the front of the ratemeter.

9.5.16 Reduce pulse generator repetition rate below "High" alarm setpoint and record alarm status "Return to Normal" on data sheet 10.5. (RESET)

9.5.17 With the function selector switch in the "cal." position depress and hold the "alert" pushbutton and adjust potentiometer R214 until a reading of 60 CPM is indicated on the ratemeter. In a similar manner, depress and hold the "high"

9.0 TEST METHOD (Cont'd.)

9.5.17 (cont'd.)

pushbutton and adjust potentiometer R205 until a reading of 6×10^4 CPM is indicated on the ratemeter. Set the function selector switch to the "Oper." position.

9.5.18 Increase pulse repetition rate until the "alert" alarm activates. Record this ratemeter value on data sheet 10.5.

9.5.19 Continue to increase the pulse repetition rate until "High" alarm activates. Record this ratemeter value on Data Sheet 10.5.

9.5.20 Reduce pulse generator repetition rate below "Alert" alarm setpoint. Reset ratemeter and clear the main control room annunciator as necessary.

9.5.21 Return the system to normal operation as follows:

a) Disconnect pulse generator from ratemeter input.

b) Reset setpoints ("Alert" and "High") just beyond full scale of ratemeter as follows:

1) "Alert" Setpoint - with the ratemeter function switch in "Cal." position, depress and hold "Alert" pushbutton and adjust R214 which is located on the ratemeter alarm circuit board.

9.0 TEST METHOD (Cont'd.)

9.5.21 (cont'd.)

2) "High" setpoint - with the ratemeter function switch in "Cal" position, depress and hold "High" pushbutton, and adjust R205 located on ratemeter alarm circuit board. Return the selector switch to the "Oper." position.

9.5.22 Reconnect the detector cable that was removed from the ratemeter in step 9.5.1.

Section 9.5 Accomplished for MU-R-720 (Gross) Sat. ✓ Unsat. _____

Signature John A. Brunner Date 2/12/78

(EW) Section 9.5 Accomplished for MU-R-720 (Iodine) Sat. ✓ Unsat. _____

Signature John A. Brunner Date ~~2/12/78~~ 3/1/78

Section 9.5 Accomplished for IC-R-1091 Sat. ✓ Unsat. _____

Signature John A. Brunner Date ~~2/12/78~~ 3/1/78

DW Section 9.5 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/1/78

TW Section 9.5 Accomplished for IC-R-1093 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 12/7/77

TW Section 9.5 Accomplished for WDL-R-1311 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 1/6/78

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9.0 TEST METHOD (Cont'd.)

TW Section 9.5 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/6/77

TW Section 9.5 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 12/7/77

TW Section 9.5 Accomplished for NS-R-3401 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 2/12/78

TW Section 9.5 Accomplished for SF-R-3402 Sat. ✓ Unsat. _____

Signature John A. Brummer Date ~~2/6/78~~ 3/2/78

Section 9.5 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 3/6/78

Section 9.5 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brummer Date 3/19/78

9.6 Source Calibration & Linearity Check

9.6.1 Test Equipment Setup

NOTE: This is a general setup procedure for each channel and will be referenced later as required.

9.6.1.1 To check detector output, connect oscilloscope as follows:

a. Slide the ratemeter chassis from monitor, far enough to make internal test connections.

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9.0 TEST METHOD (Cont'd.)

9.6.1.1 b. Connect input lead of oscilloscope to blue wire connection at ratemeter switch (front deck terminal No. 12). Connect ground lead to ratemeter chassis.

9.6.1.2 Connect scaler as follows:

a. Connect scaler input to the log ratemeter card between R13 and R16 or R18 and R14 and connect scaler ground to ratemeter chassis.

b. Set the following controls and allow equipment to stabilize for a minimum of 15 minutes.

1. Function switch to "Oper." position.
2. Oscilloscope to "On" position.
3. Scaler to "On" position.

9.6.2 Calibration of MU-R-720.

9.6.2.1 Set up equipment in accordance with step 9.6.1.

9.6.2.2 Depress and hold the "C.S." pushbutton and indicate "Yes" on Data Sheet 10.6 if an increase above background is indicated and record the ratemeter reading.

9.6.2.3 Calibration with detector and source utilizing liquid sampler.

9.6.2.3.1 Open the sliding links as listed for MU-R-720 on Enclosure 2, Table 3.

9.6.2.3.2 Using pulse generator, provide signal (frequency of 10,000 pps, negative output voltage ampiltude of 0.2 volt) to input of ratemeter (iodine) by connecting the pulse generator lead to "signal In" at rear of ratemeter. Slowly increase pulse generator output amplitude until the ratemeter just begins to count. Observe the generator output pulse amplitude on the oscilloscope and record this peak pulse voltage level on Data Sheet 10.6.

9.6.2.3.3 Disconnect pulse generator from the MU-R-720 terminal and close the sliding links that were opened in step 9.6.2.3.1.

9.6.2.3.4 Reset scaler to zero and run a 2 minute background count. Multiply binary counts observed by two and divide by time (minutes) to give CPM. Record information on Data Sheet 10.6.

9.6.2.3.5 Attach CO-60 (G-1002) source to detector as follows:

9.0 TEST METHOD (Cont'd.)

9.6.2.3.5 a) Remove sampler well shield cap from top of sampler, and remove detector from well.

b) Attach source to detector as shown in Enclosure 2 Figure 4 using the source holder.

c) Insert detector into well and secure shield cap in place.

9.6.2.3.6 Allow the indicated radiation level on the recorder (HP-UR-3264) and ratemeter modules (iodine and grass) to stabilize. Then record the values from the ratemeter & recorder (HP-UR-3264) for MU-R-720 (Iodine & Gross) on data sheet no. 10.6 under the respective "Corrected Source Reading".

9.6.2.3.7 Take a two minute scaler run and record the scaler CPM (Take the scaler reading, multiply by 2 and divide by the time in minutes) on data sheet#10.6.

9.6.2.3.8 Remove the detector and CO-60 (G-1002) source from the sampler and remove the source and the holder from the detector.

9.6.2.3.9 Background Correction of Radiation Source Readings. Subtract the background readings obtained in step 9.6.2.3.4 from the source reading obtained in step 9.6.2.3.7. Enter these results in the "Corrected Sources Reading" on Data Sheet 10.6.

9.6.2.3.10 Calculation of Expected Source Readings

a) Obtain the "Original Source Reading" and date of the "Original Source Reading" from the Isotopic Calibration Test Report Section of the Victoreen Technical Manual, and record these on Data Sheet 10.6.

b) Calculate "t" to the nearest month. "t" is the time elapsed between the "Original CPM" date and the date of the source reading for this test.

c) Calculate the "Expected source reading" using Enclosure 2 Table 2. Enter the value on Data Sheet 10.6.

9.6.2.3.11 Comparison of Actual and Expected Source Readings.

9.6.2.3.11 a) Compare the scaler "Corrected Source Reading" with the "Expected Source Reading". The "Corrected Source Reading", using the scaler value; should be within ± 15% of the "Expected Source Reading" value.

b) Compare the value obtained from the "Corrected Source Reading" of the ratemeter with the value of the "Corrected Source Reading" of the scaler. This reading should be within one minor division of the ratemeter reading. Record accuracy on Data Sheet No. 10.6.

NOTE: A minor division on the ratmeter is the distance between any "8" on the meter and the next higher mark.

c) Compare the value obtained from the "Corrected Source Reading" of the recorder with the value of the "Corrected Source Reading" of the scaler. The reading should be within one minor division of the recorder scale. Record accuracy on Data Sheet No. 10.6.

NOTE: A minor division on the recorder is the distance between any "9" on the scale and the next higher mark.

9.6.2.3.11 d) If the CPM's obtained do not fall within the acceptable limits, check the following:

-positioning and facing of the source on the detector.

-verify that no cracks appear in the detector window.

-correct deficiencies if necessary and then repeat the last CPM reading.

If the new CPM's are not within the acceptable limits, but is within twice the allowable tolerance, make slight adjustments to the high voltage per the manufacturer's maintenance manual and repeat all CPM readings that were made on the ratemeter until all CPM's are within limits.

9.6.2.3.12 Replace the detector in the sampler and take another 2 minute background reading using the scaler and record the scaler CPM on Data Sheet 10.6 for the 133 Ba sampler source run.

9.6.2.3.13 Attach 133 Ba (No. 177) source to detector according to step 9.o.2.3.5 as shown in Enclosure 2 Figure 5.

9.6.2.3.14 Repeat steps 9.6.2.3.6 thru 9.6.2.3.11 for the 133 Ba (No. 177) source.

9.6.2.3.15 Repeat steps 9.6.2.3.12 thru 9.6.2.3.14 for the 137 Cs (No. 177) source.

9.6.2.3.16 Obtain the 133 Ba (No. 138) Source from Unit 1 and repeat steps 9.6.2.3.12 thru 9.6.2.3.14.

9.6.2.3.17 Obtain the 137 Cs (No. 138) Source from Unit 1 and repeat steps 9.6.2.3.12 thru 9.6.2.3.14.

9.6.2.3.18 Obtain the 133 Ba (No. 192) Source (Unit 1/2 common) and repeat steps 9.6.2.3.12 thru 9.6.2.3.14).

9.6.2.3.19 Obtain the 137 Cs (No. 192) Source (Unit 1/2 common) and repeat steps 9.6.2.3.12 thru 9.6.2.3.14.

9.6.2.4 Calibration with detector and source utilizing TMI Standard Calibration fixture.

9.6.2.4.1 Insert detector in standard calibration fixture, "SCF" and determine background countrate from scaler using a 2 minute scaler run. Record scaler CPM on Data Sheet 10.6.

9.6.2.4.2 Insert source and detector in "SCF" as follows:

a) Remove detector from "SCF".

b) Attach ^{60}Co (No. G-1002) source to detector as shown in Enclosure 2, Fig. 3.

c) Re-insert detector into "SCF".

9.6.2.4.3 Allow the indicated radiation level on the recorder (HP-UR-3264) and ratemeters (iodine and gross) to stabilize, then record the radiation level for MU-R-720 from the ratemeter modules (both Iodine and Gross) and points 1 and 2 on HP-UR-3264 on Data Sheet 10.6.

9.6.2.4.4 Take a two minute scaler run and record the scaler CPM (Take the scaler reading, multiply by two and divide by the time in minutes) on Data Sheet 10.6.

9.6.2.4.5 Remove the detector and the ^{60}Co (G-1002) source from the "SCF" and remove the source and the holder from the detector.

9.6.2.4.6 Repeat steps 9.6.2.3.9 thru 9.6.2.3.19 using the TMI Standard Calibration fixture for the remaining combinations of sources.

9.0 TEST METHOD (Cont'd.)

9.6.3 Linearity of MU-R-720

9.6.3.1 With detector and sources utilizing the TMI Standard Calibration Fixture ("SCF").

9.6.3.1.1 Place the detector and the 4.18 µCi 133 Ba (#A) source in the geometry, blank side up as shown in Enclosure 2, Fig. 6. Take a 2 minute count run and record the count rate on Data Sheet 10.6.

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9.6.3.1.2 Repeat step 9.6.3.1.1 using the 0.115 µCi 133 Ba (#D) source.

9.6.3.1.3 Repeat step 9.6.3.1.1 using the 0.0041 µCi 133 Ba (#I) source. Count the source for 20 minutes. Compute the count rate by dividing the binary counts displayed by one-half of the counting time.

9.6.3.1.4 Transfer the data recorded steps 9.6.3.1.1 thru 9.6.3.1.3 to the graph provided on Data Sheet 10.6.

Note that a linear relationship exists between source activity (µCi) and countrate (CPM). If plot is abnormal from a best fit straight line, alignment procedure must

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be performed in accordance with manufacturer's instructions, Reference 2.2.1.

NOTE: The source used in this linearity check have not been reduced by decay factors because the source decay will not affect the linearity; it will change the slope and position of the plot.

9.6.3.2 With detector and Unit 1 linearity sources utilizing the TMI Standard Calibration Fixture ("SCF").

9.6.3.2.1 Repeat section 9.6.3.1 using the Unit 1 sources as follows:

first-highest activity-6.455 µCi ^{133}Ba (ICN 15.43)

second-medium activity-0.0984 µCi ^{133}Ba (ICN 0.1129)

third-lowest activity-0.0041 µCi ^{133}Ba (ICN 0.0041)

and record measurements on Data Sheet 10.6.

9.6.3.3 Return the system to normal operation. Disconnect all special equipment.

9.6.4 Calibration of liquid monitors IC-R-1091 thru WT-R-3895.

9.6.4.1 Set up equipment in accordance with step 9.6.1.

9.6.4.2 Depress and hold the "C.S." pushbutton and indicate "yes" on Data Sheet 10.6 if an increase above background is indicated and record the ratemeter reading.

9.0 TEST METHOD (Cont'd.)

9.6.4.3 Calibration with detector and sources utilizing liquid sampler.

9.6.4.3.1 Open the sliding links as listed for the channel to be calibrated on Enclosure 2, Table 3.

9.6.4.3.2 Using pulse generator, provide signal (frequency of 10,000 pps, negative output, voltage amplitude of 0.2 volt) to input of ratemeter. Slowly increase pulse generator output amplitude until the ratemeter just begins to count. Observe the generator output pulse amplitude on the oscilloscope and record this peak pulse voltage level on Data Sheet 10.6 for Clip Voltage under "Actual".

9.6.4.3.3 Disconnect pulse generator, and reconnect detector to ratemeter by closing the sliding links that were opened in step 9.6.4.3.1.

9.6.4.3.4 Reset scaler to zero and run a 2 minute background count. Multiply binary counts observed by two and divide by time (in minutes) to give CPM. Record information on Data Sheet 10.6.

9.0 TEST METHOD (Cont'd.)

9.6.4.3.5 Attach ^{133}Ba (No. 177) source to detector as follows:

a) Remove sampler well shield cap from top of sampler and remove detector from well.

b) Attach source to detector as shown in Enclosure 2 Figure 3 using the source holder.

c) Insert detector into well and secure shield cap in place.

9.6.4.3.6 Allow the indicated radiation level on the recorder (HP-UR-3264) and ratemeter module to stabilize, then record the radiation level for the monitor under test from the ratemeter module and ~~point 3 on HP-UR-3264~~ the appropriate recorder point for monitor under test on HP-UR-326 on Data Sheet 10.6.

E-6

9.6.4.3.7 Take a two minute scaler run and record the scaler CPM (Take the scaler reading, multiply by 2 and divide by the time in minutes) on Data Sheet No. 10.6.

9.6.4.3.8 Remove the detector and ^{133}Ba (No.177) source from the sampler and remove the source and holder from the detector.

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9.0 TEST METHOD (Cont'd.)

9.6.4.3.9 Evaluate the results of the scaler run by repeating steps 9.6.2.3.9 thru 9.6.2.3.11 for the ^{133}Ba (No. 177) source.

9.6.4.3.10 Replace the detector in the sampler and take another 2 minute background reading using the scaler and record the scaler CPM on Data Sheet No. 10.6 for the ^{137}CS-sampler source run.

9.6.4.3.11 Attach the ^{137}CS (No. 177) source to detector according to step 9.6.4.3.5 as shown in Enclosure 2, Figure 3.

9.6.4.3.12 Repeat steps 9.6.4.3.6 thru 9.6.4.3.9 for the ^{137}CS (No. 177) source.

9.6.4.3.13 Repeat steps 9.6.4.3.10 thru 9.6.4.3.12 for the ^{133}Ba (No. 138) Source from Unit 1.

9.6.4.3.14 Repeat steps 9.6.4.3.10 thru 9.6.4.3.12 for the ^{137}Cs (No. 138) Source from Unit 1.

9.6.4.3.15 Repeat steps 9.6.4.3.10 thru 9.6.4.3.12 for ^{133}Ba (No. 192) Source (Unit 1-2 common).

9.0 TEST METHOD (Cont'd.)

9.6.4.3.16 Repeat steps 9.6.4.3.10 thru 9.6.4.3.12 for the ^{137}Cs (No. 192) Source Unit 1-2 common).

9.6.4.4 With detector and source utilizing TMI Standard Calibration Fixture ("SCF").

9.6.4.4.1 Insert detector in SCF and determine background countrate from scaler using a 2 minute scaler run. Record scaler CPM on Data Sheet 10.6.

9.6.4.4.2 Insert source and detector in "SCF" as follows:

a) Remove detector from "SCF"

b) Attach ^{133}Ba (No. 177) source to detector as shown in Enclosure 2, Figure 2.

c) Reinsert detector into "SCF".

9.6.4.4.3 Allow the indicated radiation level on the recorder (HP-UR-3264) and ratemeter to stabilize, then record the radiation level for the monitor from the ratemeter module and appropriate point on HP-UR-3264 on Data Sheet No. 10.6.

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9.0 TEST METHOD (Cont'd.)

9.6.4.4.4 Take a two minute scaler run and record the scaler CPM (Take the scaler reading, multiply by two and divide by the time in minutes) on Data Sheet No. 10.6.

9.6.4.4.5 Remove the detector and the ^{133}Ba (No.177) source from the "SCF" and remove the source and the holder from the detector.

9.6.4.4.6 Repeat steps 9.6.4.3.9 thru 9.6.4.3.16 using the TMI Standard Calibration fixture for the remaining combinations of sources.

9.6.5 Linearity of liquid monitors IC-R-1091 thru WT-R-3895.

9.6.5.1 Repeat section 9.6.3 for all remaining liquid monitors and record data on Data Sheet 10.6.

Section 9.6 Accomplished for MU-R-720 Sat. ✓ Unsat. _____

Signature J A Bauman Date 3/15/78

Section 9.6 Accomplished for IC-R-1091 Sat. ✓ Unsat. _____

Signature John A Bauman Date 3/12/78

Section 9.6 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature J A Bauman Date 3/12/78

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9.0 TEST METHOD (Cont'd.)

Section 9.6 Accomplished for IC-R-1093 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

Section 9.6 Accomplished For WDL-R-1311 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

Section 9.6 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

Section 9.6 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

Section 9.6 Accomplished for NS-R-3401 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

Section 9.6 Accomplished for SF-R-3402 Sat. ✓ Unsat. _____

Signature J B Brumm Date 3/12/78

D-22 Section 9.6 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 3/15/78

Section 9.6 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brumm Date 3/15/78

9.7 Interlock Testing

9.7.1 Verification of "Normal"/"Defeat" bypass interlock system.

9.7.1.1 WDL-R-1311.

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9.7.1.1.1 Verify that WDL-R-1311 is not in alarm condition.

9.7.1.1.2 Turn all radiation monitoring interlock bypass switches to the "normal" position.

9.7.1.1.3 Place the WDL-R-1311 bypass switch in the "defeat" position. Record on Data Sheet 10.7 that the annunciator window on Panel 12 "Radiation Monitoring System Trouble" is flashing. Acknowledge the alarm as required.

9.7.1.1.4 Turn all remaining radiation monitoring interlock bypass switches to the "defeat" position.

9.7.2 Set point adjustment for "alert" and "high" alarms.

9.7.2.1 Alarm Setpoint Adjustment

NOTE: The setpoints are incorporated into Met-Ed Operating procedure 2105-1.12 "Radiation Monitoring System Setpoints".

9.7.2.1.1 Adjust applicable monitor setpoints to the calculated values as indicated in 2105-1.12, as follows:

9.0 TEST METHOD (Cont'd.)

9.7.2.1.1.1 "Alert" setpoint - with the ratemeter function selector switch in "Cal." position, depress and hold "alert" pushbutton and adjust R214 which is located on the ratemeter alarm circuit board. Record the setpoint on Data Sheet 10.7.

9.7.2.1.1.2 "High" setpoint - with the ratemeter function selector switch in the "Cal." position, depress and hold "high" pushbutton, and adjust R205 located on ratemeter alarm circuit board. Return the function selector switch to the "Oper" position. Record the setpoint on Data Sheet 10.7.

9.7.3 Test of Radiation Monitor interlocks.

9.7.3.1 This test is designed to verify proper operation of interlock functions associated with the Liquid Radiation Monitoring System; specifically WDL-R-1311, WT-R-3894 & WT-R-3895.

9.7.3.2 WDL-R-1311 interlock test.

9.0 TEST METHOD (Cont'd.)

9.7.3.2.1 Verify the following on Data Sheet No. 10.7.

9.7.3.2.1.1 Ratemeter function selector switch in "Oper." position.

9.7.3.2.1.2 "Fail/Reset" indicator is ON.

9.7.3.2.2 Radwaste Panel Switch & Breaker alignment.

9.7.3.2.2.1 Insure that the following circuit breakers are closed to feed power to the Radwaste Panel 301B.

MP2-46 Switch No.16

MP2-46 Switch No. 18

9.7.3.2.2.2 Valves WDL-V99 and WDL-V100 are operable.

9.7.3.2.3 Unit 1/Unit 2 interlock test.

9.7.3.2.3.1 Establish communications from Radwaste panel No. 301 to the Unit 2 control room and the Unit 1 control room.

9.7.3.2.3.2 Verify that WDL-V257 in Unit 1 is closed.

9.7.3.2.3.3 Open WDL-V99 by turning the keylock switch on Panel 301B to OPEN.

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9.7.3.2.3.4 Verify that Unit 1's WDL-V257 will not open by placing its control switch on the Radwaste panel to open and noting that there is no change in valve position.

9.7.3.2.3.5 Close WDL-V99.

9.7.3.2.3.6 Open WDL-V257 in Unit 1.

9.7.3.2.3.7 Verify that WDL-V99 will not open by placing the keylock switch on Panel 301B to OPEN and noting that there is no change in valve position.

9.7.3.2.3.8 Close WDL-V257 on Unit 1.

9.7.3.2.4 Simulation of High Radiation condition at WDL-R-1311.

9.7.3.2.4.1 Turn WDL-R-1311 bypass switch on Panel 12 to NORMAL.

9.7.3.2.4.2 Connect the pulse generator to the rate-meter input at Panel 12. Set the pulse generator as follows:

Pulse output polarity - negative

Pulse output amplitude - 1.0 volt

Pulse width - 1.0 μ Sec.

9.0 TEST METHOD (Cont'd.)

9.7.3.2.4.3 Open WDL-V100 using control switch on Panel 301B.

9.7.3.2.4.4 Open WDL-V99 using keylock switch on Panel 301B.

9.7.3.2.4.5 Open WDL-V93A and WDL-V93 using control switches on Panel 301B.

9.7.3.2.4.6 Start WDL-P-11A & B using the control switches on Panel 301B.

9.7.3.2.4.7 Start WDL-P-8A & B using the control switches on Panel 301A.

9.7.3.2.4.8 Increase the pulse generator repetition rate until a high alarm is received and verify and record on Data Sheet 10.7 that the "Alert" and "High" indicator lights on WDL-R-1311 Ratemeter are ON.

9.7.3.2.4.9 Verify and record on Data Sheet 10.7 the Main Annunciator Status.

9.7.3.2.4.10 Acknowledge alarms in the Control Room and on the Radwaste panel No. 301A & B.

9.7.3.2.4.11 Verify and record on Data Sheet 10.7 that the following valves have closed: WDL-V93 A & B, WDL-V99 & WDL-V100.

9.7.3.2.4.12 Verify and record on Data Sheet 10.7 that WDL-P-11A & B and WDL-P-8A&B trip.

9.7.3.2.4.13 Reduce pulse generator repetition rate below WDL-R-1311 "Alert" setpoint.

9.7.3.2.4.14 Clear alarms by depressing the RESET pushbutton for the Main Annunciators and the Radwaste panel #301B annunciator.

9.7.3.2.4.15 Disconnect pulse generator from the WDL-R-1311 ratemeter input.

9.7.3.2.4.16 Turn WDL-R-1311 bypass switch on Panel 12 to the DEFEAT position.

9.7.3.3 WT-R-3894 interlock test.

9.7.3.3.1 Verify the following on Data Sheet 10.7.

9.7.3.3.1.1 Ratemeter function selector switch in "Oper." position.

9.7.3.3.1.2 "Fail/Reset" indicator is ON.

9.7.3.3.1.3 WT-FHS-3894 on WT-R-3894 is in AUTO.

9.7.3.3.1.4 Insure that WT-V119 is closed and WT-V118 is open by the indicating lights on WT-R-3894. Insure that both valves are operable.

9.7.3.3.2 Simulation of High Radiation condition at Radiation Monitor WT-R-3894.

9.7.3.3.2.1 Connect the pulse generator to the rate-meter input at WT-R-3894. Set the pulse generator as follows:
Pulse output polarity-negative
Pulse output amplitude-1.0 volt
Pulse width-1.0 μ sec.

9.7.3.3.2.2 Increase the pulse generator repetition rate until a high alarm is received and verify and record on Data Sheet No.10.7 that the "alert" and "high" indicator lights on WT-R-3894 are ON.

9.7.3.3.2.3 Verify and record on Data Sheet No.16 that the "Radiation Monitoring System Trouble" alarm on Panel 12 has been received.

9.7.3.3.2.4 Acknowledge the alarm on Panel 12.

9.7.3.3.2.5 Verify and record on Data Sheet 10.7 that WT-V119 is now open and WT-V118 is now closed by the indicating lights on WT-R-3894.

9.7.3.3.2.6 Reduce pulse generator repetition rate below Radiation Monitor WT-R-3894 "alert" setpoint.

9.7.3.3.2.7 Clear alarms by depressing the RESET pushbutton for the Main Annunciator.

9.7.3.3.2.8 Disconnect pulse generator from WT-R-3894 ratemeter input.

9.7.3.4 WT-R-3895 interlock test.

9.7.3.4.1 Repeat section 9.7.3.3 for Radiation Monitor WT-R-3895 with the following changes: Change WT-V118 to WT-V115

9.0 TEST METHOD (Cont'd.)

9.7.3.4.1 (cont'd.)

Change WT-V119 to WT-V121.

Record Data on Data Sheet No.10.7.

WDL-R-1311 not complete 3/13.

Section 9.7 Accomplished Sat. ✓ Unsat. _____

Signature John A Brunner Date 3/15/78

9.8 Flow verification test

9/13 9.8.1 Insure that the system relative to the monitor under test is operational, or capable of having a sample drawn from it and returned.

9.8.2 Insure that the monitor is aligned to the system per 2105-1.8 Radiation Monitoring.

9.8.3 For the following monitors, insure the sample pumps are running and there is normal flow indication on Panel 12 or on Local panels MU-R-720, IC-R-1091, IC-R-1092, WDL-R-1311, WT-R-3894, WT-R-3895 and record status on Data Sheet 10.8.

D-11

9.8.4 For the following monitors insure there is normal flow indication on Panel 12: IC-R-1093, DC-R-3399, DC-R-3400, NS-R-3401, SF-R-3402, and record status on Data Sheet 10.8.

9.8.5 For a monitor listed in step 9.8.3 stop the sample pump and verify on Data Sheet 10.8 the flow alarm indication for

D-11 E-15

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9.0 TEST METHOD (Cont'd.)

9.8.5 (cont'd.)

the monitor on Panel 12 or locally and the record flow rate at which the alarm was received. Restart the pump after the flow alarm has been received.

CAUTION: DO NOT THROTTLE CLOSED ANY VALVE IN THE FLOW PATH THAT CONTAINS A SAMPLE PUMP.

9.8.6 For a monitor listed in step 9.8.4 slowly close the isolation valve upstream of the flow switch until a flow alarm indication on Panel 12. Record the alarm on Data Sheet 10.8 and the flow rate at which the alarm was received. Open the valve after the data has been recorded.

E-15

Section 9.8 Accomplished for MU-R-720 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/15/78

E-24

Section 9.8 Accomplished for IC-R-1091 Sat. _____ Unsat. _____

Signature _____ Date _____

Section 9.8 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/15/78

Section 9.8 Accomplished for IC-R-1093 Sat. ✓ Unsat. _____

Signature John A. Brunner Date 3/21/78

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9.0 TEST METHOD (Cont .)

D-11 E-15 Section 9.8 Accomplished for WDL-R-1311 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 2/2/78

Section 9.8 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/12/78

Section 9.8 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/12/78

Section 9.8 Accomplished for NS-R-3401 Sat. _____ Unsat. _____

Signature _____ Date _____

Section 9.8 Accomplished for SF-R-3402 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/12/78

Section 9.8 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature J Brumme Date 3/16/78

E-25 Section 9.8 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/21/78

9.9 Return all systems to normal operation. Disconnect any and all special test equipment.

Section 9.9 Accomplished for MU-R-720 (Gross) Sat. ✓ Unsat. _____

Signature John A. Brumme Date 3/15/78

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9.0 TEST METHOD (Cont'd.)

Section 9.9 Accomplished for AU-R-720 (Iodine) Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for IC-R-1091 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for IC-R-1092 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for IC-R-1093 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for WDL-R-1311 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 2/2/78

Section 9.9 Accomplished for DC-R-3399 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for DC-R-3400 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

Section 9.9 Accomplished for NS-R-3401 Sat. ✓ Unsat. _____

Signature J. Bauman Date 3/16/78

Section 9.9 Accomplished for SE-R-3402 Sat. ✓ Unsat. _____

Signature John A. Bauman Date 3/15/78

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9.0 TEST METHOD (Cont'd.)

Section 9.9 Accomplished for WT-R-3894 Sat. ✓ Unsat. _____

Signature J H Brennan Date 3/16/78

Section 9.9 Accomplished for WT-R-3895 Sat. ✓ Unsat. _____

Signature J H Brennan Date 3/16/78

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DATA SHEET 10.1

LOCAL MONITOR LOCATION AND DETECTOR CABLE CONNECTIONS

RADIATION MONITOR NUMBER	RATEMETER SERIAL #	YES/NO	DETECTOR MODEL NUMBER	YES/NO	SAMPLER & DETECTOR LOCATION	CABLE CONNECTION YES/NO	INITIALS/ORG.	DATE
MU-R-720 (Gross)	842-10-646	yes	843-30-280	yes	Primary Coolant Letdown-Gross	yes	JKL MCE	3/1/78
MU-R-720 (Iodine)	842-30-766	yes		yes	Primary Coolant Letdown-Iodine	yes	JKL MCE	3/1/78
IC-R-1091	842-10-663	yes	843-30-178	yes	Intermediate Cooling Letdown-MU-C-1B	yes	JKL MCE	3/5/78
IC-R-1092	842-10-751	yes	843-30-173	yes	Intermediate Cooling Letdown-MU-C-1A	yes	JKL MCE	3/5/78
IC-R-1093	842-10-683	yes	843-30-180		Intermediate Cooling Cooler Outlet	yes	JKL MCE	12/5/77
WDL-R-1311	842-10-675	yes	843-30-199	yes	Plant Effluent	yes	JKL MCE	12/7/77
DC-R-3399	842-10-678	yes	843-30-187	yes	Decay Heat Closed Cooling-Loop A	yes	JKL MCE	12/5/77
DC-R-3400	842-10-739	yes	843-30-198	yes	Decay Heat Closed Cooling-Loop B	yes	JKL MCE	12/5/77
NS-R-3401	842-10-722	yes	843-30-195	yes	Nuclear Services Closed Cooling	yes	JKL MCE	3/5/78
SF-R-3402	842-10-753	yes	843-30-165	yes	Spent Fuel Cooling	yes	JKL MCE	3/5/78
WT-R-3894	842-10-673	yes	843-30-151	yes	Water treatment and condensate polishing	yes	JKL MCE	3/2/78
WT-R-3895	842-10-750	yes	843-30-290	yes		yes	JKL MCE	3/2/78

NAME John R. Burmer Date 3/5/78 Organization Mat Ed

DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	120 VDC	[illegible]	3/3/78
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.554 VDC	[illegible]	3/3/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.332 VDC	[illegible]	3/3/78
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	+22.9 VDC	[illegible]	3/3/78
10.1.4	High Voltage	710 VDC	710 VDC	[illegible]	3/3/78

~~3/6/78~~

NAME [illegible] DATE 3/3/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	120 VDC	[illegible]	3-2-78
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	[illegible] VDC	[illegible]	3-3-78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.342 VDC	[illegible]	3-3-78
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	[illegible] VDC	[illegible]	3-2-78
10.1.4	High Voltage	720 VDC	720 VDC	[illegible]	3-2-78

NAME J. Brennan / Mat Ed DATE 3/6/78 3/3/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.42 VDC	JB 1 Met-Ed	9/29/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	14.92 VDC	DW 1 MET ED	2/12/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.15 VDC	JB 1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	+23.88 VDC	JB 1 Met-Ed	10/1/77
10.1.4	High Voltage	700 VDC	683 VDC	DW 1 MET ED	2/12/78

NAME John A. Brumme DATE 2/28/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.43 VDC	JB 1 Met-Ed	9/29/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	[illegible] VDC	[illegible]	[illegible]
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.27 VDC	JB 1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	~~23.81~~ +23.76 VDC	JB 1 Met-Ed	10/1/77
10.1.4	High Voltage	710 VDC	[illegible] VDC	[illegible]	[illegible]

NAME John A. Bummer DATE 2/10/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
	RATEMETERS				
10.1.3	(a) Supply Voltage	120VAC (Nominal)	118.43 VDC	JB1 Met-Ed	9/23/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.23 VDC	JB1 Met-Ed	1/30/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.28 VDC	JB1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	23.68 VDC	JB1 Met-Ed	10/1/77
10.1.4	High Voltage	830 VDC	830.2 VDC	TJM Met-Ed	12/7/77

NAME John A. Brumm DATE 1/30/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.45 VDC	JB 1 Met-Ed	9/23/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.32 VDC	JB 1 Met-Ed	1/30/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.36 ~~-6.34~~ VDC	JB 1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	23.91 ~~24.20~~ VDC	JB 1 Met-Ed	10/1/77
10.1.4	High Voltage	700 VDC	700.0 VDC	JB 1 Met-Ed	10/1/77

NAME John A. Brumm DATE 1/30/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
	RATEMETERS				
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.44 VDC	JB 1 Met-Ed	9/29/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	14.97 VDC	[illegible] Met Ed	1/28/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.12 VDC	JB 1 Met Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	23.60 VDC	JB 1 Met Ed	10/1/77
10.1.4	High Voltage	750 VDC	750 VDC	ITM 1 MET ED	10/1/77

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC (Nominal)	118.41 VDC	JB 1 Met-Ed	9/25/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.06 VDC	JB 1 Met-Ed	1/30/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.34 VDC	JB 1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	23.81 ~~24.09~~ VDC	JB 1 Met-Ed	10/1/77
10.1.4	High Voltage	790 VDC	790 VDC	RL 1 (MEC)	8 Jan. 78

NAME John A. Brenner DATE 1/30/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
	RATEMETERS				
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.43 VDC	JB 1 Met-Ed	9/29/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.18 VDC	TW 1 MET ED	2/12/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.14 VDC	JB 1 Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	+24.08 VDC	JB 1 Met-Ed	10/1/77
10.1.4	High Voltage	600 VDC	600 VDC	TW 1 MET ED	2/12/78

NAME John A. Bussma DATE 2/28/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC (Nominal)	115.5 ~~118.4~~ VDC	JB 1 Mat Ed	2/6/78 ~~9/20/77~~
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.64 VDC	JB 1 Mat Ed	2/6/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.28 ~~6.28~~ VDC	JB 1 Mat Ed	2/6/78 ~~10/1/77~~
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	20.70 ~~23.70~~ VDC	JB 1 Mat Ed	2/6/78 ~~10/1/77~~
10.1.4	High Voltage	775VDC	770 VDC	JB 1 Mat Ed	2/6/78

NAME John A. Brunner DATE 2/6/78

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RADIATION
MONITOR
MU-R-720
Gross

DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
RATEMETERS					
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.42 VDC	JB 1 Met-Ed	9/29/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.41 VDC	TW 1 MET ED	2/11/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.35 VDC	JB 1 Met Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	+ 23.77 ~~+24.0372~~ VDC	JB 1 Met Ed	10/1/77
10.1.4	High Voltage	780 VDC	780 VDC	TW 1 MET ED	2/11/78

NAME John A. Bynum DATE 2/12/78

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DATA SHEET NO. 10.1

VOLTAGE CHECKOFF

	DESCRIPTION OF REQUIRED DATA	REQUIRED VOLTAGE	TEST READING	INITIALS/ ORGANIZATION	DATE
	RATEMETERS				
10.1.3	(a) Supply Voltage	120VAC(Nominal)	118.41 VDC	JB / Met-Ed	9/28/77
	(b) Regulated Voltage Supply (+16 VDC)	+16 ± 1.5 VDC	15.33 VDC	RSW / MET-ED	2/11/78
	(c) Regulated Voltage Supply (-6.2 VDC)	-6.2 ± .5 VDC	-6.27 VDC	JB / Met-Ed	10/1/77
	(d) Unregulated Voltage Supply (+22 VDC)	+22 ± 3 VDC	+23.39 VDC	JB / Met-Ed	10/1/77
10.1.4	High Voltage	780 VDC	780 VDC	RSW / MET-ED	2/11/78

NAME John A. Brunner DATE 2/12/78

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DATA SHEET NO. 10.2

SECTION	DESCRIPTION OF REQUIRED DATA	OPERATES PROPERLY YES/NO	INITIALS/ORG.	DATE
10.2.1.4	"Fail" Indicator Lamp Operational Verification			
	MU-R-720 Gross	YES	TJW/MET ED	2/11/78
	MU-R-720 Iodine	YES	REW/MET ED	2/11/78
	IC-R-1091	YES	REW	2/5/78
	IC-R-1092	YES	TJW MET ED	2/12/78
	IC-R-1093	YES	TJW./MET ED	12/7/77
	WDL-R-1311	YES	TJW/MET ED	1/6/78
	DC-R-3399	YES	TJW./MET ED	12/6/77
	DC-R-3400	YES	TJW/MET ED	12/7/77
	NS-R-3401	YES	[illegible]	[illegible]
	SF-R-3402	YES	TJW/MET ED	2/12/78
	WT-R-3894	[illegible]	[illegible]	[illegible]
	WT-R-3895	yes	[illegible]/Met Ed	3/15/78
	Verification of Annunciator Operation for "Radiation Monitoring System Trouble" Alarm			
	MU-R-720 Gross } MU-R-720 Iodine }	YES YES	TJW/MET ED REW/M.E	2/1/78 2/12/78
	IC-R-1091	YES	REW/Met-Ed	2/5/78
	IC-R-1092	YES	TJW MET ED	2/12/78
	IC-R-1093	YES	TJW./MET ED	12/7/77
	WDL-R-1311	YES	TJW/MET ED	1/6/78
	DC-R-3399	YES	TJW./MET ED	12/6/77
	DC-R-3400	YES	TJW./MET ED	12/7/77

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DATA SHEET NO. 10.2 (Cont'd.)

SECTION	DESCRIPTION OF REQUIRED DATA	OPERATES PROPERLY YES/NO	INITIALS/ORG.	DATE
10.2.1.4 (cont'd.)	NS-R-3401	[illegible]	[illegible]	[illegible]
	SF-R-3402	YES	DW MET ED	2/12/78
	WT-R-3894	[illegible]	[illegible]	3 3 78
	WT-R-3895	yes	JB Met Ed	3/15/78
10.2.2.5	Verification of Control Room Alarm From Local Monitors "Liquid Monitor Trouble/Hi Rad.".			
	WT-R-3894	yes	JB Met Ed	3/15/78
	WT-R-3895	yes	JB Met Ed	3/15/78
	Verification of Local Annunciator and Horn Alarms.			
	WT-R-3894	yes	JB Met Ed	3/15/78
	WT-R-3895	yes	JB Met Ed	3/15/78

NAME: J Bumm DATE 3/15/78 ORGANIZATION Met Ed

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DATA SHEET NO. 10.3

RADIATION MONITOR	RECORDER NO.	CHANNEL	ZERO ALIGNED PROPERLY YES/NO	PROPER PRINT WHEEL ALIGNMENT YES/NO	SUFFICIENT INK YES/NO	CHART SPEED .5 in/hr	1 in/hr	2 in/hr	4 in/hr	8 in/hr	INIT/ORG.	DATE
MU-R-720(GR)	HP-UR-3264	1	YES	YES	YES	.5	1	2	4	8	DW MTED	2/11/78
MU-R-720 (I)	HP-UR-3264	2	YES	YES	YES	NA	NA	NA	NA	NA	REW	2/11/78
IC-R-1091	HP-UR-3264	3	YES	YES	YES	NA	NA	NA	NA	NA	REW	2/5/78
IC-R-1092	HP-UR-3264	4	YES	YES	YES	NA	NA	NA	NA	NA	DW MED	3/1/78
IC-R-1093	HP-UR-3264	5	YES	YES	YES	NA	NA	NA	NA	NA	TJW	12/2/77
WDL-R-1311	HP-UR-3264	6	YES	YES	YES	NA	NA	NA	NA	NA	TJW	1/6/78
DC-R-3399	HP-UR-3264	7	YES	YES	YES	NA	NA	NA	NA	NA	TJW	12/2/77
DC-R-3400	HP-UR-3264	8	YES	YES	YES	NA	NA	NA	NA	NA	TJW	12/2/77
NS-R-3401	HP-UR-3264	9	YES	YES	YES	NA	NA	NA	NA	NA	[illegible]	[illegible]/78
SF-R-3402	HP-UR-3264	10	YES	YES	YES	NA	NA	NA	NA	NA	DW MED	3/2/78
WT-R-3894	WT-R-3894	1	YES	N/A	YES	NA	1	NA	E-27 5	NA	JHS MHCl	3/2/78
WT-R-3895	WT-R-3895	1	YES	N/A	YES	NA	1	NA	E-27 5	NA	JHS MHCl	3/2/78

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NAME [signature] DATE 3/15/78 ORG. MHCl

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DATA SHEET 10.3

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.3.1.2	HP-UR-3264 zero with zero input	10 zeroed	zeroed	JB Mat-Ed	1/26/78
10.3.1.2	HP-UR-3264 full scale deflection with ~~10mV~~ 1.0v input	1×10^6	1×10^6	JB Mat-Ed	1/26/78
10.3.2.2	WT-UR-3894 zero with null input	zeroed	zeroed	JS Mat Ed	3/5/75
10.3.2.2	WT-UR-3894 full scale deflection with ~~50 mV~~ 1V input	1×10^6	1×10^6	JS Mat Ed	3/5/75
10.3.2.7	WT-UR-3895 zero with null input	zeroed	zeroed	JS Mat Ed	3/5/75
10.3.2.7	WT-UR-3895 full scale deflection with ~~50 mV~~ 1V input	1×10^6	1×10^6	JS Mat Ed	3/5/75

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Data Sheet 10.4

MUR-720-6

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0 v	0V	REW/MJTED	2/11/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO	zero scale	REW/MJTED	2/11/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.00 v.	~~10~~ 1V mV	REW/MJTED	2/11/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1 x 10^6	1 x 10^6	REW/MJTED	2/11/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

MU-R-720 Hi

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.006	0V	TJW MET ED	2/11/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO SCALE	zero scale	TJW MET. ED	2/11/78
10.4.1 ±16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.002V	~~10 mV~~ 1V	TJW MET ED	2/11/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/11/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

IC-R-1091

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.08	0V	TJW MET ED	2/8/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO SCALE ≈ 10 cpm	zero scale	TJW MET ED	2/8/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.0 V	E-16 1V ~~10 mV~~	TJW MET ED	2/8/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/8/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

IC-R-1092

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.001	0V	TJW MET ED	2/12/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO SCALE	zero scale	TJW MET ED	2/12/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.00	1V ~~10 mV~~	TJW MET ED	2/12/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/12/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

IC-R-1093

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0	0V	[illegible] M.E.S.d	3/5/75
10.4.1	P12 or local ratemeter scale zero with null input	Zero scale	zero scale	[illegible] M-E	3/5/75
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1V	~~10 mV~~ 1V	[illegible] M-E	3/5/75
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1x10^6	1 x 10^6	[illegible] M-E	3/5/75
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)	Zero scale	zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

WDL-R-1311

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0	0V	JB Mat-El	1/30/78
10.4.1	P12 or local ratemeter scale zero with null input	0	zero scale	JB Mat El	1/30/78
10.4.1	P12 or local ratemeter recorder output with 1×10^6 CPM input	10	10 mV	JB Mat El	1/30/78
10.4.1	P12 or local ratemeter scale with 1×10^6 CPM input	1×10^6	1×10^6	JB Mat El	1/30/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)	0	zero scale	JB Mat El	1/30/78
10.4.1	Remote ratemeter scale with ~~1×10^6~~ 1.5×10^2 CPM input (WDL-R-1311 only) E-13	1.5×10^2	1.5×10^2 ~~1×10^6~~	JB Mat El	1/30/78

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Data Sheet 10.4

DC-R-3597

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.002	0V	TJW MET ED	2/10/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO	zero scale	TJW MET ED	2/10/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.00V	1V ~~10 mV~~	TJW MET ED	2/10/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/10/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

DC-L-3400

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.004	0V	TJW ~~0.004~~ MET ED	2/9/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO SCALE	zero scale	TJW MET ED	2/9/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.00V	1V 1Ω ~~mV~~	TJW MET ED	2/9/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/9/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

NS-R-3401

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	.00 V	0V	RSW/METED	2/10/78
10.4.1	P12 or local ratemeter scale zero with null input	ZERO	zero scale	RSW/METED	2/10/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.00V ~~10 mV~~	1V ~~10 mV~~	RSW/METED	2/10/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1 x 10^6	1 x 10^6	RSW/METED	2/10/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

SF-R-3402

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0.003	0V	TJW MET ED	2/12/78
10.4.1	P12 or local ratemeter scale zero with null input	zero scale	zero scale	TJW MET ED	2/12/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1.000	1V ~~10 mV~~	TJW MET ED	2/12/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	TJW MET ED	2/12/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

WT-R-3894

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	0	0V	[illegible]	3/15/78
10.4.1	P12 or local ratemeter scale zero with null input	0	zero scale	[illegible]	3/15/78
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	1	1 V ~~10 mV~~	[illegible]	3/15/78
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1.0×10^6	1 x 10^6	[illegible]	3/15/78
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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Data Sheet 10.4

WT-R-3895

Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.4.1	P12 or local ratemeter recorder output with null input	-.001	0V	JM / MtEd	3/5/75
10.4.1	P12 or local ratemeter scale zero with null input	Zero scale	zero scale	JM / MtEd	3/5/75
10.4.1 E16	P12 or local ratemeter recorder output with 1 x 10^6 CPM input	.995	1V ~~10 mV~~	JM / MtEd	3/5/75
10.4.1	P12 or local ratemeter scale with 1 x 10^6 CPM input	1×10^6	1 x 10^6	JM / MtEd	3/5/75
10.4.1	Remote ratemeter scale zero with null input (WDL-R-1311 only)		zero scale		
10.4.1	Remote ratemeter scale with 1 x 10^6 CPM input (WDL-R-1311 only)		1 x 10^6		

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PROCEDURE NO.: TP 360
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: AL-R-22

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10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	TJW MET ED	2/11/78
10	600	600	TJW / MET ED	2/11/78
10^2	6,000	6000	TJW / MET ED	2/11/78
10^3	60,000	60 000	TJW / MET ED	2/11/78
10^4	600,000	600 000	TJW / MET ED	2/11/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)

NAME John A. Dennis DATE 2/11/78

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER | MLR-72 LO IODINE

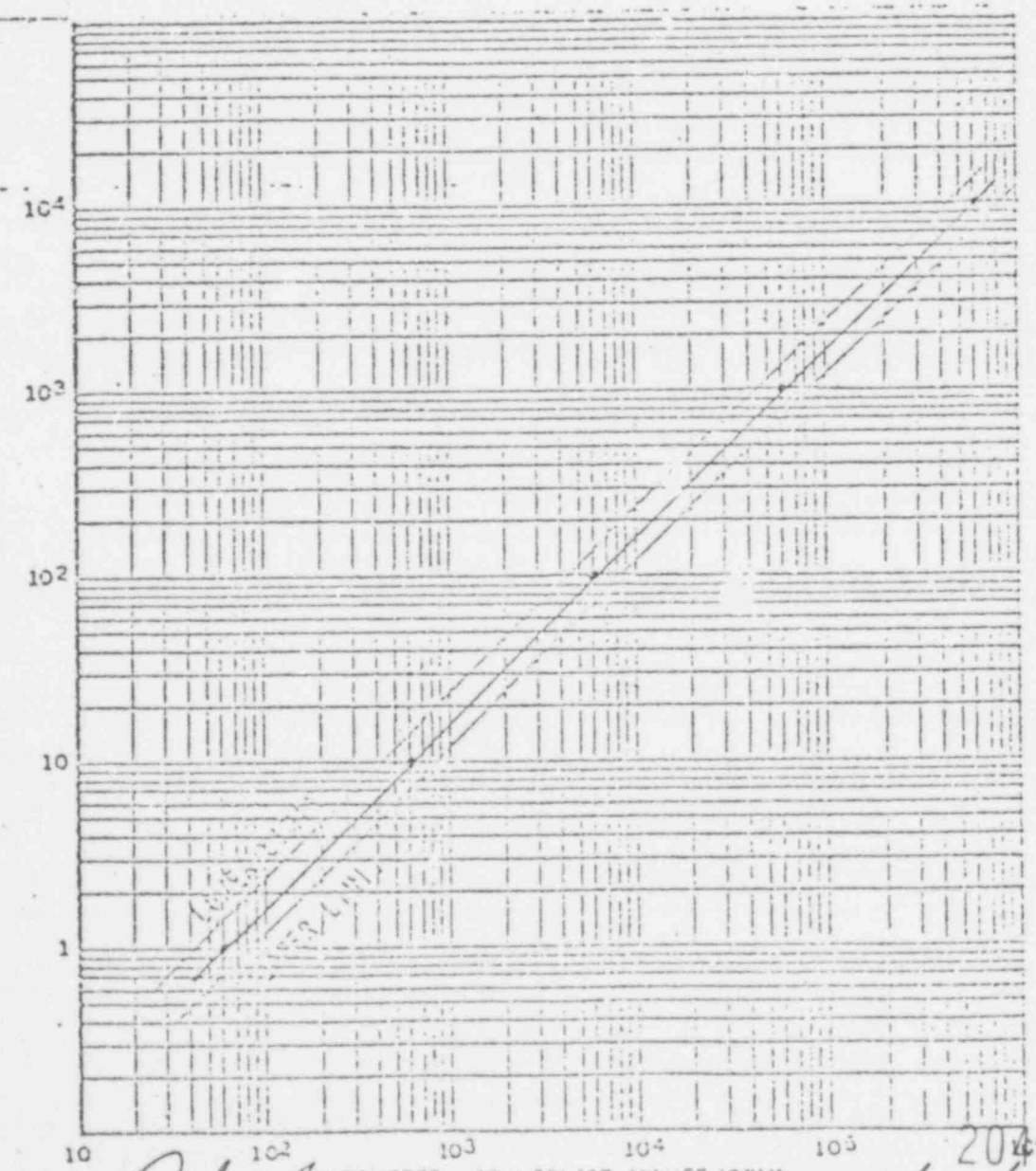
DATA SHEET NO 10.5 PAGE 1 OF 12

10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	RSW / M-E	2/11/78
10	600	600	RSW / M-E	2/11/78
10^2	6,000	6000	RSW / M-E	2/11/78
10^3	60,000	60000	RSW / M-E	2/11/78
10^4	600,000	600000	RSW / M-E	2/11/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John A Brunner DATE 2/21/78 ORGANIZATION MET-ED

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER | 1C-R-105

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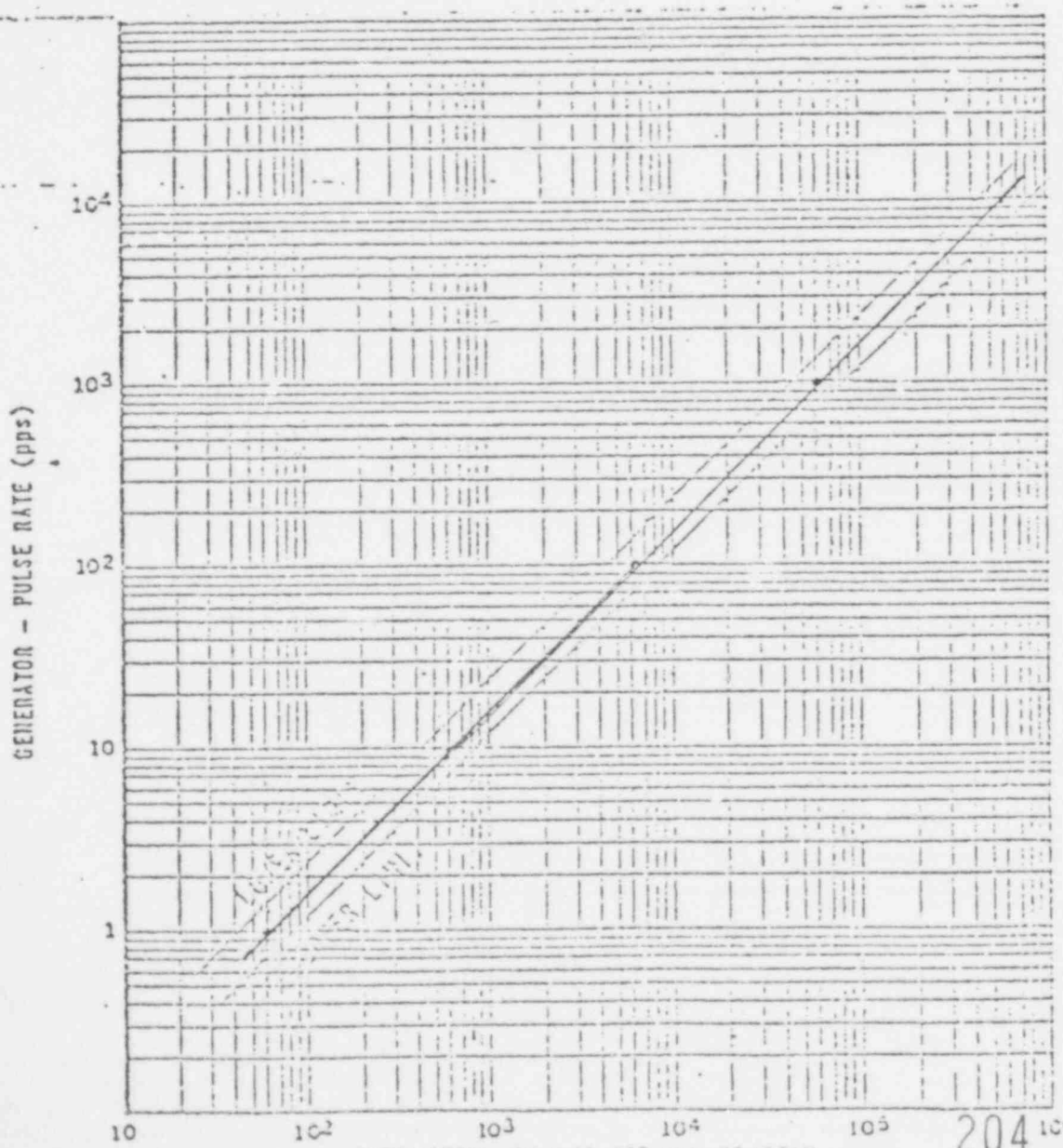
10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JAB / Met-Ed	2/12/78
10	600	600	JAB / Met Ed	2/12/78
10^2	6,000	6,000	JAB / Met-Ed	2/12/78
10^3	60,000	60,000	JAB / Met-Ed	2/12/78
10^4	600,000	600,000	JAB / Met-Ed	2/12/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John A. Bowman DATE 2/12/78 ORGANIZATION Met Ed

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PROCEDURE NO.: TP 360/

PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER	1C-R-1C

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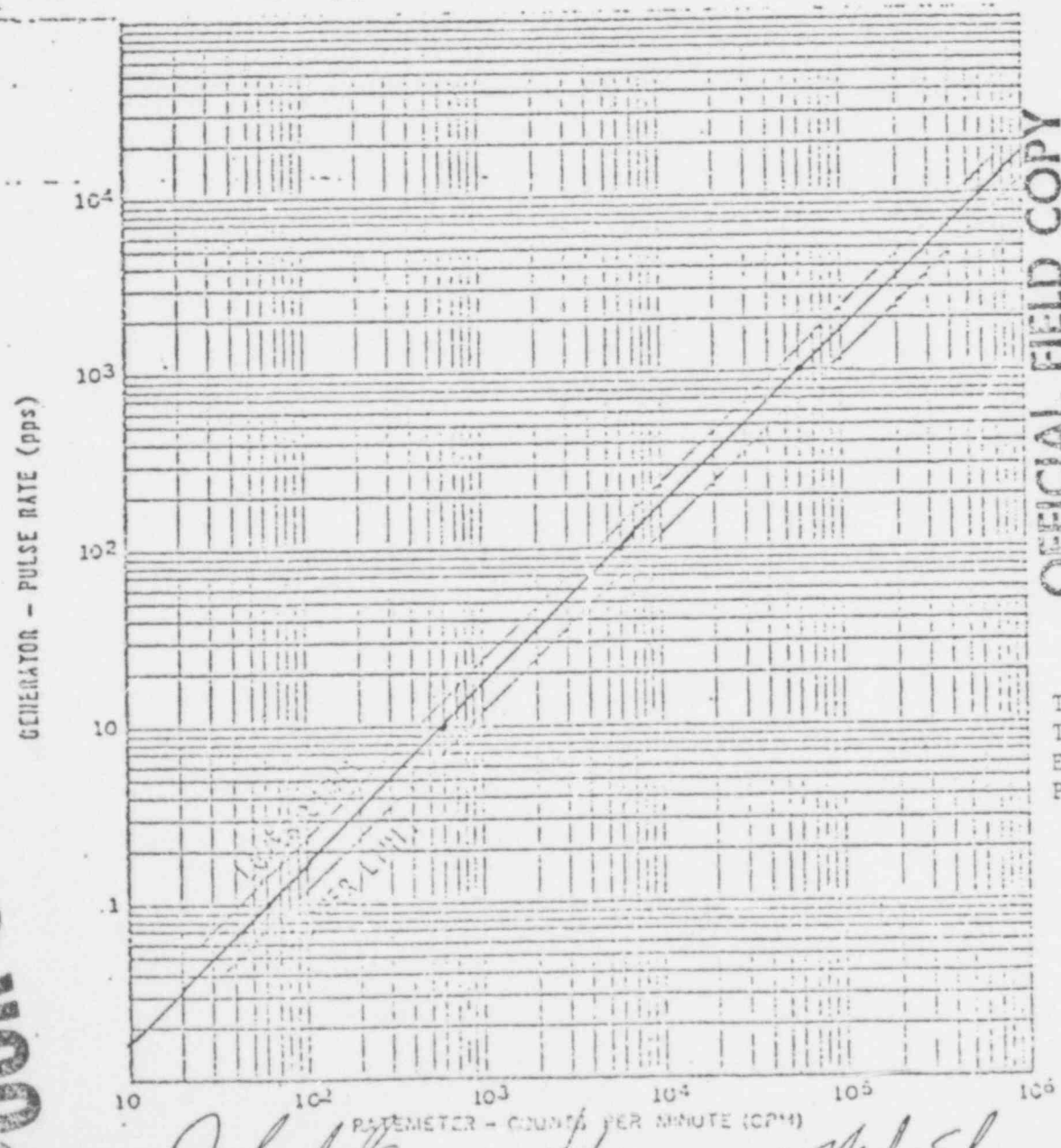
10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JJW MET ED	2/12/78
10	600	600	JJW / MET ED	2/12/78
10^2	6,000	6000	JJW / MET ED	2/12/78
10^3	60,000	60000	JJW / MET ED	2/12/78
10^4	600,000	600000	JJW / MET ED	2/12/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John A Brown DATE 2/12/78 ORGANIZATION Met-Ed

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PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: C-R-1093

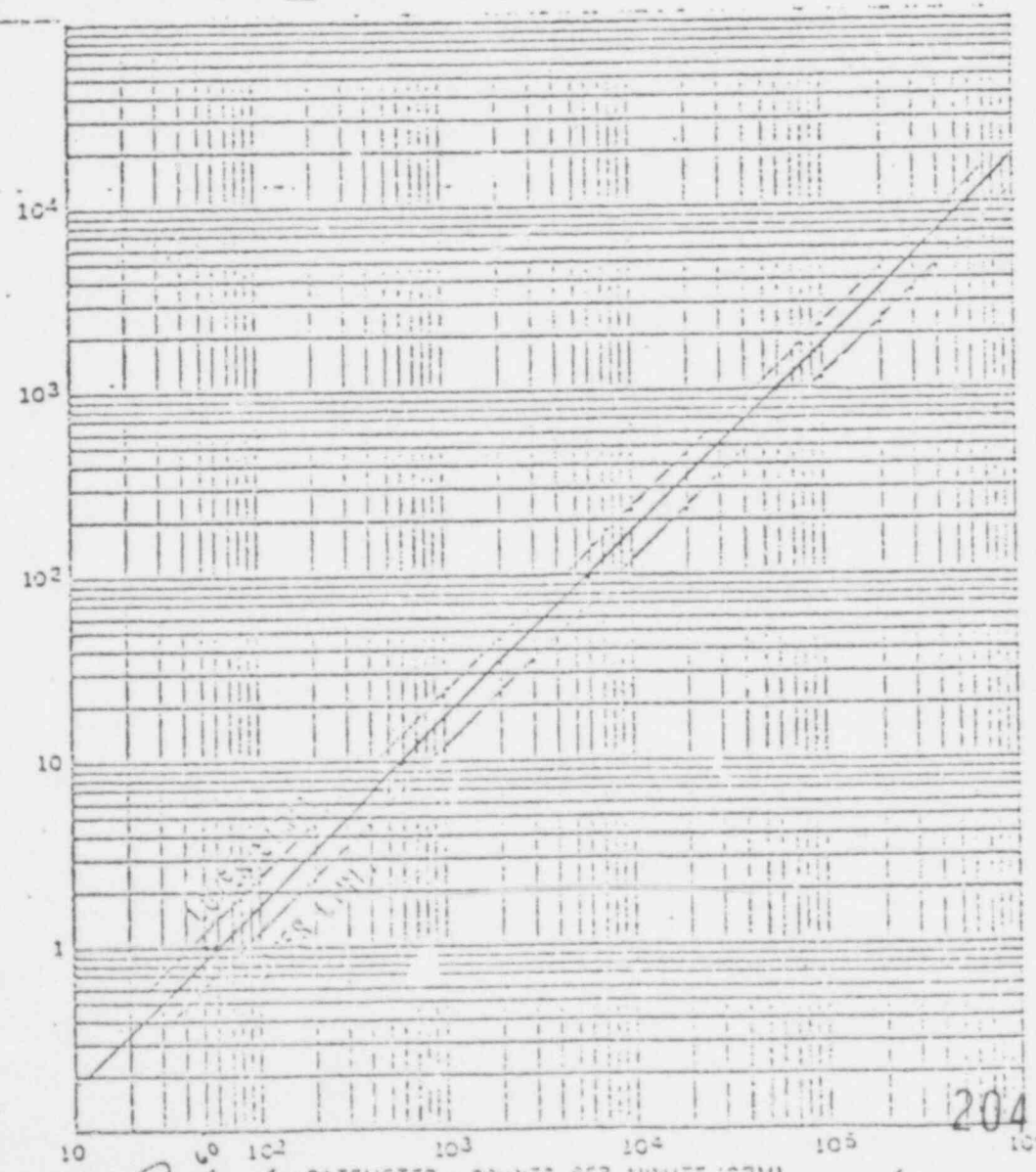
DATA SHEET NO 10.5 PAGE 1 OF 12

10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	7Rb (MEC)	8Jan.78
10	600	600	7Rb / (MEC)	8Jan.78
10^2	6,000	6000	7Rb / (MEC)	8Jan.78
10^3	60,000	60,000	7Rb / (MEC)	8Jan.78
10^4	600,000	600,000	7Rb / (MEC)	8Jan.78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John Blumer DATE 8/1/78 ORGANIZATION MET-ED

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER	R-13

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10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	DB / TMI-E	3/5/78
10	600	600	DB / TMI-E	3/5/78
10^2	6,000	6,000	DB / TMI-E	3/5/78
10^3	60,000	60,000	DB / TMI-E	3/5/78
10^4	600,000	600,000	DB / TMI-E	3/5/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)

NAME John A. Brennan DATE 3/6/78 ORGANIZATION MET-ED

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PROCEDURE NO.: TP 360A

PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER 1-R-84

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10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JB Met-Ed	2/12/78
10	600	600	JB / Met-Ed	2/12/78
10^2	6,000	6,000	JB / Met-Ed	2/12/78
10^3	60,000	60,000	JB / Met-Ed	2/12/78
10^4	600,000	600,000	JB / Met-Ed	2/12/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)

NAME John A. Brunner DATE 2/12/78 ORGANIZATION Met-Ed

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PROCEDURE NO.: TP 360

PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: F-R-34

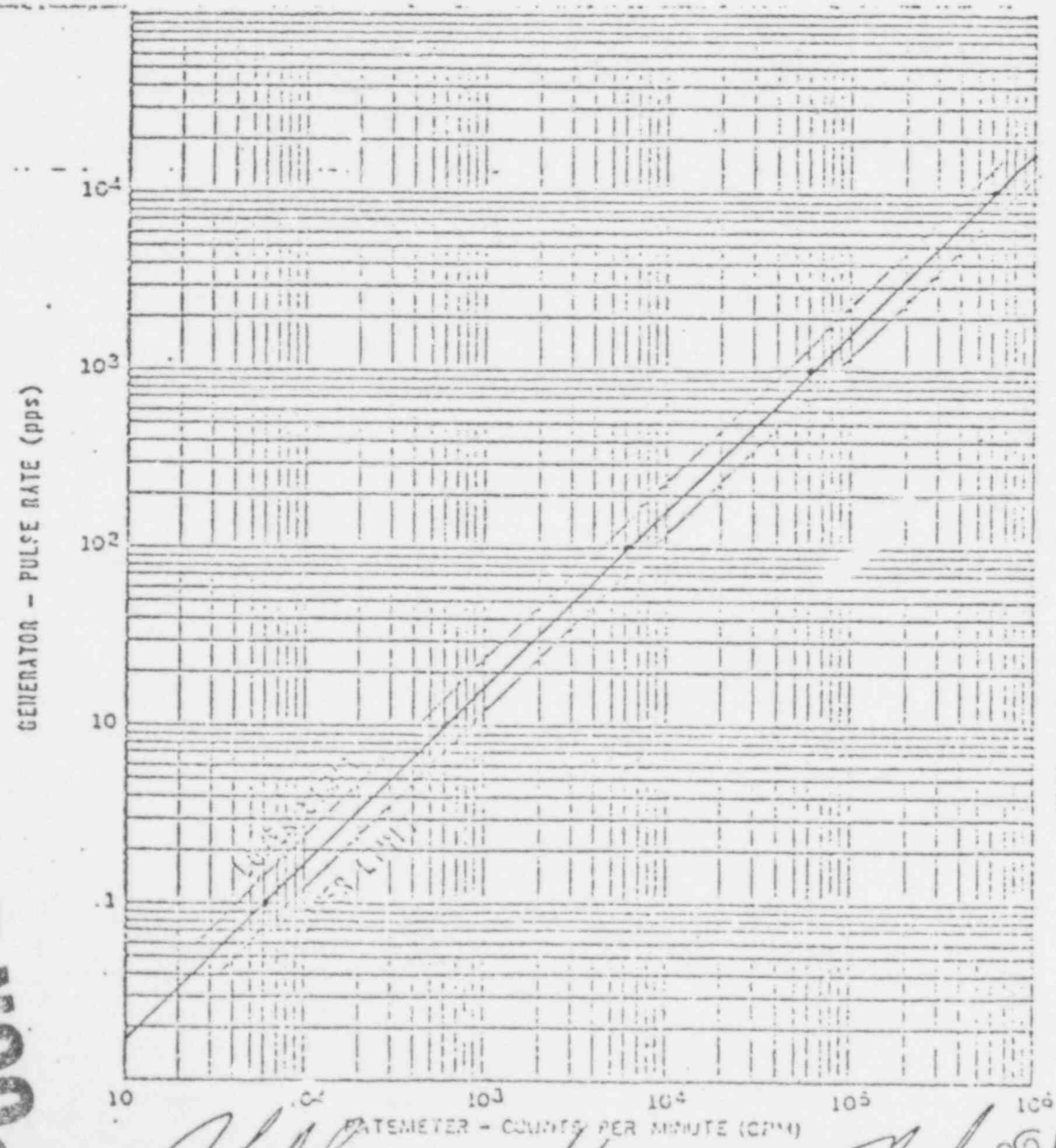
DATA SHEET NO 10.5 PAGE 1 OF 12

10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JSW / MET ED	2/12/78
10	600	600	JSW / MET ED	2/12/78
10^2	6,000	6000	JSW / MET ED	2/12/78
10^3	60,000	60000	JSW / MET ED	2/12/78
10^4	600,000	600000	JSW / MET ED	2/12/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John A Burns DATE 3/1/78 ORGANIZATION Nuc-204

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER PL-R-33

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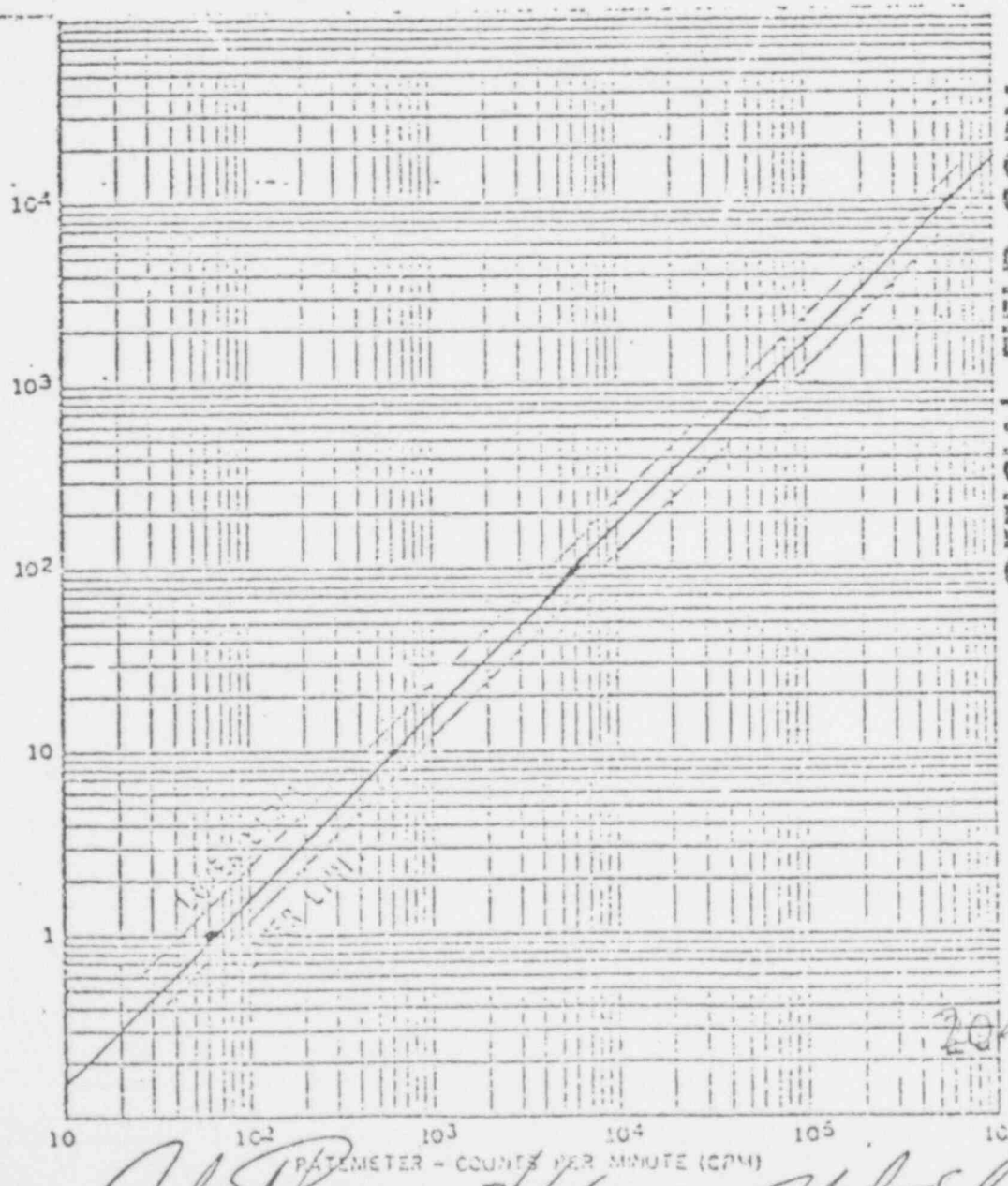
10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JSW MET ED	2/10/78
10	600	600	JSW / MET ED	2/10/78
10^2	6,000	6000	JSW / MET ED	2/10/78
10^3	60,000	60000	JSW / MET ED	2/10/78
10^4	600,000	600000	JSW / MET ED	2/10/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



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NAME John A Brumm DATE 2/10/78 ORGANIZATION MET ED

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER pC-R-34

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10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JAB Met-Ed	2/12/78
10	600	600	JAB / Met-Ed	2/12/78
10^2	6,000	6,000	JAB / Met-Ed	2/12/78
10^3	60,000	60,000	JAB / Met-Ed	2/12/78
10^4	600,000	600,000	JAB / Met-Ed	2/12/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)

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PREPARED: John A. Brunner DATE 2/12/78 ORGANIZATION Met Ed

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10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JM / MET-ED	3/3/75
10	600	600	JM / MET-ED	3/3/75
10^2	6,000	6,000	JM / MET-ED	3/3/75
10^3	60,000	60,000	JM / MET-ED	3/3/75
10^4	600,000	600,000	JM / MET-ED	3/3/75

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)

NAME John A. Brammer DATE 3/6/75 ORGANIZATION Met-Ed

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PROCEDURE NO.: TP 360/
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: R-3M

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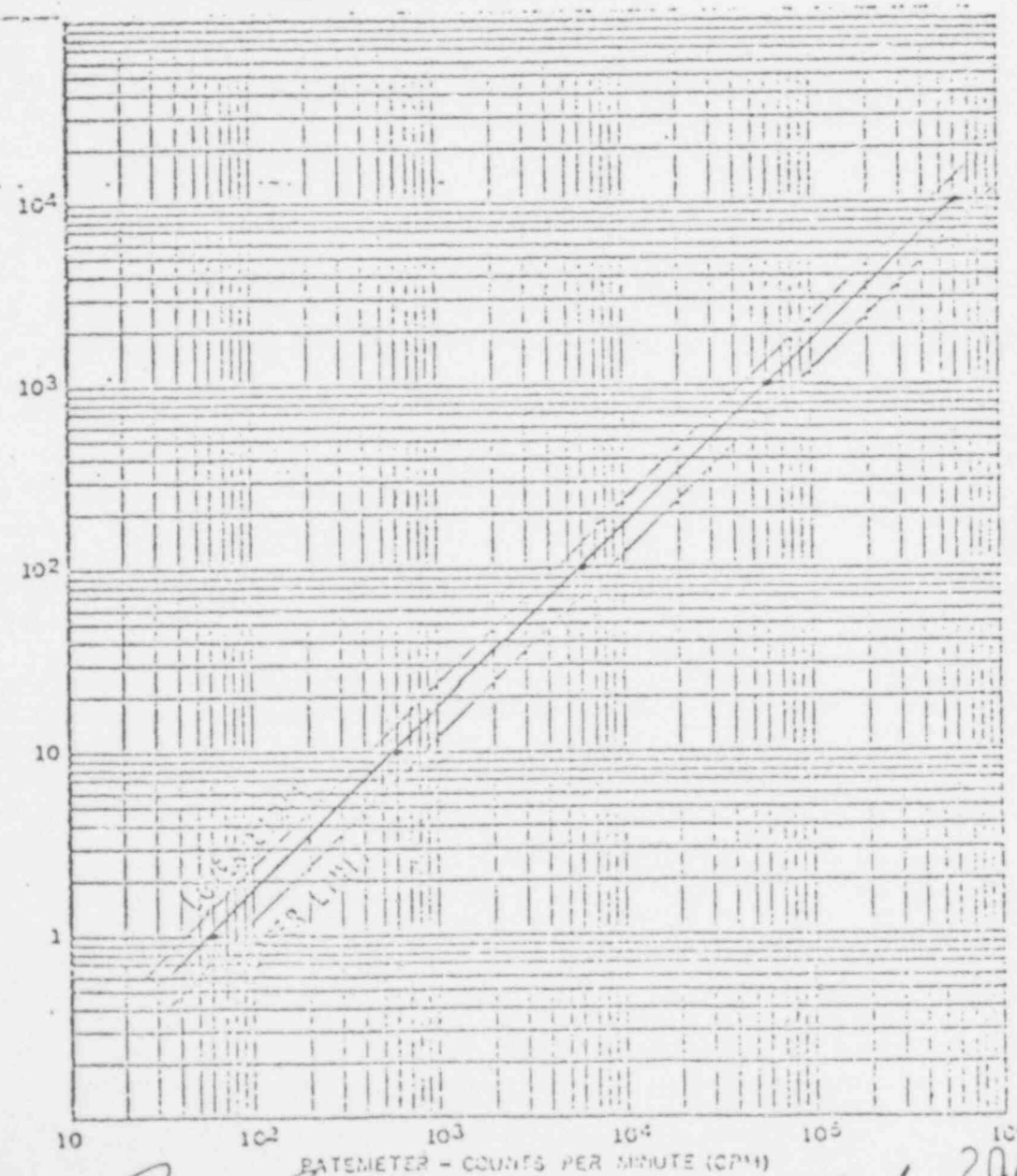
10.5.3 LINEARITY DATA (USING PULSE GENERATOR)

10.5.4

PULSE RATE (pps)	PULSE RATE (CPM)	RATEMETER (CPM)	INITIALS/ORGANIZATION	DATE
1	60	60	JM / M-E	3/5/78
10	600	600	JM / M-E	3/6/78
10^2	6,000	6,000	JM / M-E	3/6/78
10^3	60,000	60,000	JM / M-E	3/6/78
10^4	600,000	600,000	JM / M-E	3/6/78

10.5.5 PLOT OF PULSE RATE (pps) VS RATEMETER COUNTRATE (CPM)



NAME John A. Brown DATE 3/6/78 ORGANIZATION Met Ed

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DATA SHEET 10.5

	CONDITION	ALARM	PANEL 12 RATEMETER LIGHT NORM	PANEL 12 RATEMETER LIGHT ACTUAL	PANEL 12 RMS TROUBLE ALARM NORM	PANEL 12 RMS TROUBLE ALARM ACTUAL	INIT/ORG.	DATE
MU-R-720(Gross)	10.5.7 Before Alarm	Alert	Off	OFF	Off	OFF	TJW MEFCO	2/11/78
		High	Off	OFF				
	10.5.10 After High Alarm	High	On	ON	On	ON	TJW MEFCO	2/11/78
		Alert	Off	OFF				
	10.5.11 After Alert Alarm	High	On	ON	On	ON	TJW MEFCO	2/11/78
		Alert	On	ON				
	10.5.12 After Reset	High	On	ON	Off	OFF	TJW MEFCO	2/11/78
		Alert	On	ON				
	10.5.16 Return to Normal	High	Off	OFF	Off	OFF	TJW MEFCO	2/11/78
		Alert	Off	OFF				
MU-R-720(Iodine)	10.5.7 Before Alarm	Alert	Off	OFF	Off	OFF	REW/ME	[illegible]
		High	Off	OFF				
	10.5.10 After High Alarm	High	On	ON	On	ON	REW/ME	[illegible]
		Alert	Off	OFF				
	10.5.11 After Alert Alarm	High	On	ON	On	ON	REW/ME	[illegible]
		Alert	On	ON				
	10.5.12 After Reset	High	On	ON	Off	OFF	REW/ME	[illegible]
		Alert	On	ON				
	10.5.16 Return to Normal	High	Off	OFF	Off	OFF	REW/ME	[illegible]
		Alert	Off	OFF				

NAME John A. Brunne DATE 3/1/78 ORG. [illegible]

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		CONDITION	ALARM	PANEL 12 RATEMETER LIGHT NORM	PANEL 12 RATEMETER LIGHT ACTUAL	PANEL 12 RMS TROUBLE ALARM NORM	PANEL 12 RMS TROUBLE ALARM ACTUAL	INIT/ORG.	DATE
IC-R-1091	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW MCT CO	2/8/78
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW MCT CO	2/8/78
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW MCT CO	2/8/78
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW MCT CO	2/8/78
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW MCT CO	2/8/78
			High	Off	OFF				
IC-R-1092	10.5.7	Before Alarm	Alert	Off	OFF OFF TJW	Off	OFF	~~TJW~~ TJW MCT CO	2/12/78
			High	Off	OFF OFF TJW				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW MCT CO	2/12/78
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW MCT CO	2/12/78
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW MCT CO	2/12/78
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW MCT CO	2/12/78
			High	Off	OFF				

NAME John A Bumme DATE 3/7/78 ORG. MCT CO

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		CONDITION	ALARM	PANEL 12 RATEMETER LIGHT NORM	PANEL 12 RATEMETER LIGHT ACTUAL	PANEL 12 RMS TROUBLE ALARM NORM	PANEL 12 RMS TROUBLE ALARM ACTUAL	INIT/ORG.	DATE
IC-R-1093	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW	12/7/77
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW	12/7/77
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW	12/7/77
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW	12/7/77
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW	12/7/77
			High	Off	OFF				
WDL-R-1311	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW	1/6/78
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW	1/6/78
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW	1/6/78
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW	1/6/78
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW	1/6/78
			High	Off	OFF				

NAME John A. Bussman DATE 1/30/78 ORG. Mt-ES

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		CONDITION	ALARM	PANEL 12 RATEMETER LIGHT NORM	PANEL 12 RATEMETER LIGHT ACTUAL	PANEL 12 RMS TROUBLE ALARM NORM	PANEL 12 RMS TROUBLE ALARM ACTUAL	INIT/ORG.	DATE
DC-R-3399	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW	12/6/77
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW	12/6/77
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW	12/6/77
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW	12/6/77
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW	12/6/77
			High	Off	OFF				
DC-R-3400	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW	12/7/77
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW	12/7/77
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW	12/7/77
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW	12/7/77
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW	12/7/77
			High	Off	OFF				

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		CONDITION	ALARM	PANEL 12 RATEMETER LIGHT NORM	PANEL 12 RATEMETER LIGHT ACTUAL	PANEL 12 RMS TROUBLE ALARM NORM	PANEL 12 RMS TROUBLE ALARM ACTUAL	INIT/ORG.	DATE
NS-R-3401	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	[illegible]	[illegible]
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	[illegible]	[illegible]
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	[illegible]	[illegible]
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	[illegible]	[illegible]
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	[illegible]	[illegible]
			High	Off	OFF				
SF-R-3402	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	TJW [illegible]	2/13/78
			High	Off	OFF				
	10.5.10	After High Alarm	High	On	ON	On	ON	TJW [illegible]	2/13/78
			Alert	Off	OFF				
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	TJW [illegible]	2/13/78
			High	On	ON				
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	TJW [illegible]	2/13/78
			High	On	ON				
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	TJW [illegible]	2/13/78
			High	Off	OFF				

NAME [illegible] DATE 3/2/78 ORG. [illegible]

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		CONDITION	ALARM	PANEL 12 & LOCAL RATEMETER LIGHT (E-17) NORM.	ACTUAL	PANEL 12 RMS TROUBLE ALARM (E-18) NORM.	ACTUAL	LOCAL MONITOR LIGHT NORM.	ACTUAL	HORN NORM.	ACTUAL	INIT/ORG.	DATE
WT-R-3894	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	Off	OFF	Off	OFF	[illegible]	
			High	Off	OFF								
	10.5.10	After High Alarm	High	On	ON	On	ON	On	ON	On	ON	[illegible]	
			Alert	Off	OFF								
	10.5.11	After Alert Alarm	Alert	On	ON	On	ON	On	ON	On	ON	[illegible]	
			High	On	ON								
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	On	ON	Off	OFF	[illegible]	
			High	On	ON								
	10.5.16	Return to Normal	Alert	Off	OFF	Off	OFF	Off	OFF	Off	OFF	[illegible]	
			High	Off	OFF								
WT-R-3895	10.5.7	Before Alarm	Alert	Off	OFF	Off	OFF	Off	OFF	Off	OFF	[illegible]	
			High	Off	ON								
	10.5.10	After High Alarm	High	On	ON	On	ON	On	ON	On	ON	[illegible]	
			Alert	Off	OFF								
	10.5.11	After Alert Alarm	Alert	On	*~~OFF~~ ON	On	ON	On	ON	On	ON	[illegible]	
			High	On	ON								
	10.5.12	After Reset (ratemeter)	Alert	On	ON	Off	OFF	On	ON	Off	OFF	[illegible]	
			High	On	ON								
	10.5.16	Return to Normal	Alert	Off	OFF	E-11 On	OFF ~~ON~~	Off	OFF	Off	OFF	[illegible]	
			High	Off	OFF								

NAME John A. Brunner DATE 3/5/78 ORG. Met-Ed

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COMPARISON OF RADIATION READING RECORDER & RATEMETER

RADIATION MONITOR NUMBER	NUMBER	RECORDER CHANNEL NO. REQUIRED	RECORDER CHANNEL NO. ACTUAL	RADIATION PRINTOUT *	PANEL 12 RATEMETER RADIATION READING*	LOCAL RATEMETER RADIATION READING*	INITIALS/ ORG.	Date
MU-R-720 (GR)	HP-UR-3264	1	1	6×10^5	6×10^5	N/A	JTW MET ED	2/1/78
MU-R-720 (I)	HP-UR-3264	2	2	6×10^5	6×10^5	N/A	[illegible]	[illegible]
IC-R-1091	HP-UR-3264	3	3	6.0×10^5	6.0×10^5	N/A	JTW MET ED	2/3/78
IC-R-1092	HP-UR-3264	4	4	6.0×10^5	6.0×10^5	N/A	JTW MET ED	2/3/78
IC-R-1093	HP-UR-3264	5	5	~~6.5×10^5~~ 6.0	6.0×10^5	N/A	JTW MET ED	2/3/78
WDL-R-1311	HP-UR-3264	6	6	6.0×10^5	6.0×10^5	E-13 **	JTW MET ED	1/6/78
DC-R-3399	HP-UR-3264	7	7	5.5×10^5	5.5×10^5	N/A	JTW MET ED	[illegible]
DC-R-3400	HP-UR-3264	8	8	6.0×10^5	6.0×10^5	N/A	JTW MET ED	4/3/78
NS-R-3401	HP-UR-3264	9	9	6.0×10^5	6.0×10^5	N/A	[illegible]	[illegible]
SF-R-3402	HP-UR-3264	10	10	6.0×10^5	6.0×10^5	N/A	JTW MET ED	2/3/78
WT-R-3894	WT-R-3894	1	1	6.0×10^5	6.0×10^5 E 17	N/A	[illegible]	
WT-R-3895	WT-R-3895	1	1	6.0×10^5	6.0×10^5 E 17	N/A	[illegible]	

*Acceptance Criteria $6 \times 10^5 \pm 1 \times 10^5$ CPM
**Display is on Panel 301B (Radwaste Panel)

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TRACKING OF SETPOINTS

	COUNTRATE REQUIRED STATUS	TEST RESULTS	INIT/ORG.	DATE
MU-R-720 (Gross)				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TJW MET ED	2/11/78
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW MET ED	2/11/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TJW MET ED	2/11/78
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW MET ED	2/11/78
MU-R-720 (Iodine)				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	[illegible] CPM	[illegible]	[illegible]
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	[illegible]	[illegible]
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	RSW/ME	2/12/78
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	RSW/ME	2/12/78
IC-R-1091				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TJW MET ED	2/8/78
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW MET ED	2/8/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TJW MET ED	2/8/78
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW MET ED	2/8/78

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TRACKING OF SETPOINTS

	COUNTRATE REQUIRED STATUS	TEST RESULTS	INIT/ORG.	DATE
IC-R-1092				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TSW MSTED	2/12/78
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW MSTED	2/12/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TSW MSTED	2/12/78
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW MSTED	2/12/78
IC-R-1093				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TSW	12/7/77
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW	12/7/77
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TSW	12/7/77
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW	12/7/77
WDL-R-1311				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TSW	1/6/78
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW	1/6/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TSW	1/6/78
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TSW	1/6/78

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TRACKING OF SETPOINTS

	COUNTRATE REQUIRED STATUS	TEST RESULTS	INIT/ORG.	DATE
DC-R-3399				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TJW	12/6/77
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW	12/6/77
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TJW	12/6/77
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW	12/6/77
DC-R-3400				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TJW.	12/7/77
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW	12/7/77
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	TJW	12/7/77
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	TJW.	12/7/77
NS-R-3401				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	RELD	2/10/78
10.5.11 "Alert" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	RELD	2/10/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	RELD	2/10/78
10.5.19 "High" setpoint	6×10^4 ± 1000 CPM	6×10^4 CPM	[illegible]	2/10/78

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Name John A. [illegible] Signature Date 2/10/78 Org. Mat-Ed

THREE MILE ISLAND NUCLEAR STATION - UNIT 2

Procedure No.: TP 36 /1B

Procedure Title: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

DATA SHEET NO. 10.5 PAGE 12 of 12

TRACKING OF SETPOINTS

	COUNTRATE REQUIRED STATUS	TEST RESULTS	INIT/ORG.	DATE
SP-R-3402				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	TJW/MET ED	2/13/78
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TJW/MET ED	2/13/78
2. Tracking of setpoints				
10.5.13 "Alert" setpoint	60 ± 10 CPM	60 CPM	TJW MET ED	2/13/78
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	TJW MET ED	2/13/78
WT-R-3894				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	60 CPM	JSI initial	3/3/78
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6.10⁴ CPM	JSI initial	3/3/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	JSI initial	3/3/78
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6.10⁴ CPM	JSI initial	3/3/78
WT-R-3895				
1. Tracking of setpoints				
10.5.10 "High" setpoint	60 ± 10 CPM	65 CPM	JH initial	3/14/78
10.5.11 "Alert" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	JH initial	3/14/78
2. Tracking of setpoints				
10.5.18 "Alert" setpoint	60 ± 10 CPM	60 CPM	JH initial	3/14/78
10.5.19 "High" setpoint	6 x 10^4 ± 1000 CPM	6x10⁴ CPM	JH initial	3/14/78

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CHECK SOURCE VERIFICATION

Step #'s 10.6.2.2
10.6.4.2

MONITOR	DEFLECTION YES/NO	RATEMETER READING	INIT./ORG.	DATE
MU-R-720 (Gross)	YES	3×10^3	[illegible]	[illegible]
MU-R-720 (Iodine)	YES	50	[illegible]	[illegible]
IC-R-1091	YES	2×10^3	[illegible]	3/1/78
IC-R-1092	YES	1.3×10^3	[illegible]	[illegible]
IC-R-1093	YES	1.5×10^3	TSW/[illegible]	12/7/77
WDL-R-1311 Panel 12	YES	3×10^3	TSW/[illegible]	1/6/78
WDL-R-1311 Remote	yes	2.5×10^3	[illegible]	3/15/78
DC-R-3399	YES	3×10^3	TSW/[illegible]	[illegible]
DC-R-3400	YES	3.5×10^3	TSW/[illegible]	12/7/77
NS-R-3401	yes	2×10^3	[illegible]	[illegible]
SF-R-3402	yes	1×10^3	[illegible]	3/12/78
WT-R-3894	YES	1×10^3	[illegible]	3 5 78
WT-R-3895	YES	10^3	[illegible]	3/2/78

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1. Channel Description MU-R-720 Gross & Iodine

2. Equipment

	CHANNEL NO.	MODEL NO.	SERIAL NO.
Sampler	MU-R-720	841-4P	N/A
Detector	MU-R-720	843-30	280
Ratemeter	MU-R-720 (Gross)	842-10	646
Ratemeter	MU-R-720 (Iodine)	842-30	766

10.6.2.3 Calibration Data
MU-R-720 (Gross) Ratemeter & Sampler Standard Cal Fix

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
CO-60 (G-1002)	651	10	106772 ~~3164~~	2	106772 ~~3164~~	106642	N/A	N/A	10^5	10^5	JHME	3/14/76
133 BA(No.177)	651	10	184291	2	184291	184161	220615	182685	1.8×10^5	1.8×10^5	JHME	3/14/76
137 CS(No.177)	651	10	131369	2	131369	131239	139033	130445	1.1×10^5	1.2×10^5	JHME	3/14/76
133 BA(No.138)	651	10	187753	2	187753	187603	N/A	N/A	1.8×10^5	1.8×10^5	JHME	3/14/76
137 CS(No.138)	651	10	79350	2	79350	79220	N/A	N/A	7.5×10^4	7.5×10^4	JHME	3/14/76
133 BA(No.192)	651	10	279840	2	279840	279710	N/A	N/A	2.6×10^5	2.6×10^5	JHME	3/14/76
137 CS(No.192)	651	10	99995	2	99995	99865	N/A	N/A	9.5×10^4	9.5×10^4	JHME	3/14/76

10.6.2.3
MU-R-720 (Iodine) Ratemeter & Sampler Standard Cal Fix

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
CO-60 (G-1002) 2.4 10^6	26	10	106772 ~~8909~~	2	8909	8777	N/A 17926	N/A	8×10^3	8×10^3	JHME	3/14/76
133 BA (No.177)	658	10	186075	2	186075	185945	223428	186074	1.8×10^5	1.8×10^5	JHME	3/14/76
137 CS (No.177)	658	10	131532	2	131532	131402	140293	130445	1.1×10^5	1.2×10^5	JHME	3/14/76
133 BA(No.138)	658	10	189115	2	189115	188983	N/A	N/A	1.8×10^5	1.8×10^5	JHME	3/14/76
137 CS(No.138)	658	10	79723	2	79723	79591	N/A	N/A	7×10^4	8×10^4	JHME	3/14/76
133 BA(No.192)	658	10	277207	2	277207	277375	N/A	N/A	2.6×10^5	2.7×10^5	JHME	3/14/76
137 CS(No.192)	658	10	99723	2	99723	99601	N/A	N/A	9.5×10^4	9.5×10^4	JHME	3/14/76

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10.6.2.4 Calibration Data
MU-R-720 (Gross) Ratemeter and ~~Standard Calibration Fixture~~ Sampler

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
CO-60 (G-1002)	169	10	108320	2	108320	108266	N/A	N/A	10^5	11×10^5	JAME	3/14/78
133 BA(No.177)	169	10	185837	2	185837	185883	220613 219058	185484	1.7×10^5	1.7×10^5	JAME	3/14/78
137 CS(No.177)	169	10	133426	2	133426	133372	139014	130459	12×10^5	13×10^5	JAME	3/14/78
133 BA(No.138)	169	10	191435	2	191435	191381	N/A	N/A	1.9×10^5	1.9×10^5	JAME	3/14/78
137 CS(No.138)	169	10	80622	2	80622	80568	N/A	N/A	8×10^4	7.5×10^4	JAME	3/14/78
133 BA(No.192)	169	10	278356	2	278356	278302	N/A	N/A	2.7×10^5	2.7×10^5	JAME	3/14/78
137 CS(No.192)	169	10	101603	2	101603	101549	N/A	N/A	10^5	10^5	JAME	3/14/78

10.6.2.4
MU-R-720 (Iodine) Ratemeter & ~~Standard Calibration Fixture~~ Sampler

CO-60(G-1002)	32	10	101445	2	101445	101392	N/A	N/A	10^5	11×10^5	JAME	3/14/78
133 BA (No.177)	274	10	183360	2	183360	183306	223062	180171	1.3×10^5	1.9×10^5	JAME	3/14/78
137 CS (No.177)	274	10	133131	2	133131	133086	140070	132640	1.2×10^5	1.3×10^5	JAME	3/14/78
133 BA(No.138)	274	10	189628	2	189628	189573	N/A	N/A	1.9×10^5	2×10^5	JAME	3/14/78
137 CS(No.138)	274	10	80472	2	80472	80417	N/A	N/A	2.5×10^4	2.5×10^4	JAME	3/14/78
133 BA(No.192)	274	10	274113	2	274113	273057	N/A	N/A	2.7×10^5	2.8×10^5	JAME	3/14/78
137 CS(No.192)	274	10	101362	2	101362	101307	N/A	N/A	10^5	10^5	JAME	3/14/78
CO-60 Ref 10%	32	10	9089	2	9089	9083		9133	8×10^5	8×10^5		

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10.6.2.3.2 MU-R-720 (Gross) Ratemeter

	Factory	Actual	Initial/Org.	DATE
Clip Voltage	0.20	.2 VDC	[illegible]	[illegible]

MU-R-720 (Iodine) Ratemeter

	Factory	Actual	Initial/Org.	DATE
Clip Voltage	0.20	.2 VDC	[illegible]	[illegible]

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER	HU-R-720

DATA SHEET NO. 10.6 PAGE 5 OF 26

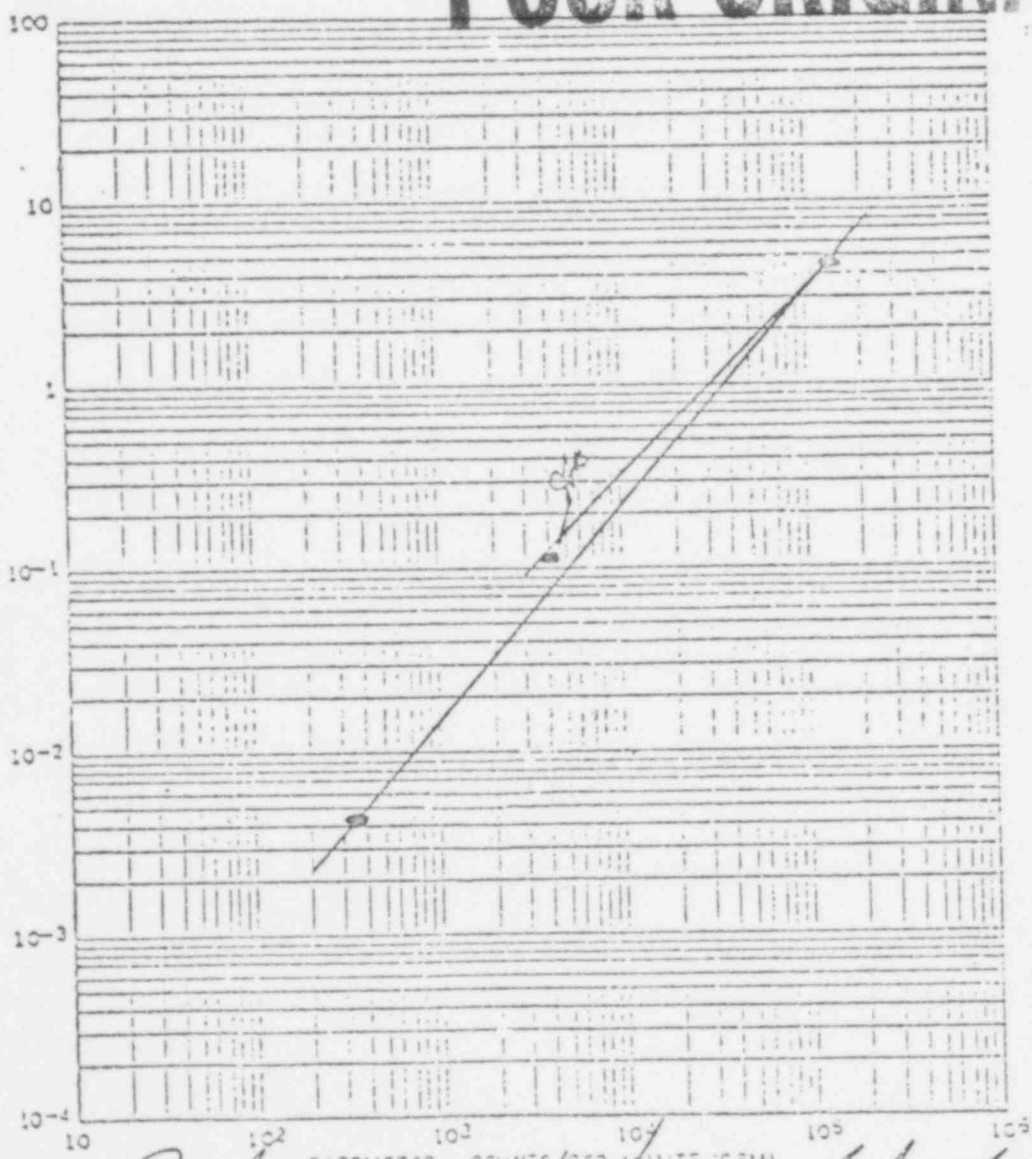
10.6.3 I. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.19	193,454	[illegible]	3/15/78
^{133}Ba (#D)	0.115	3861	[illegible]	3/15/78
^{133}Ba (#E)	0.0041	349	[illegible]	3/15/78

1. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS SOURCE (CPM)

POOR ORIGINAL



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NAME [illegible] DATE 3/15/78 [illegible]

THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: RC-R-1040

DATA SHEET NO. 10.6 PAGE 5 OF 26

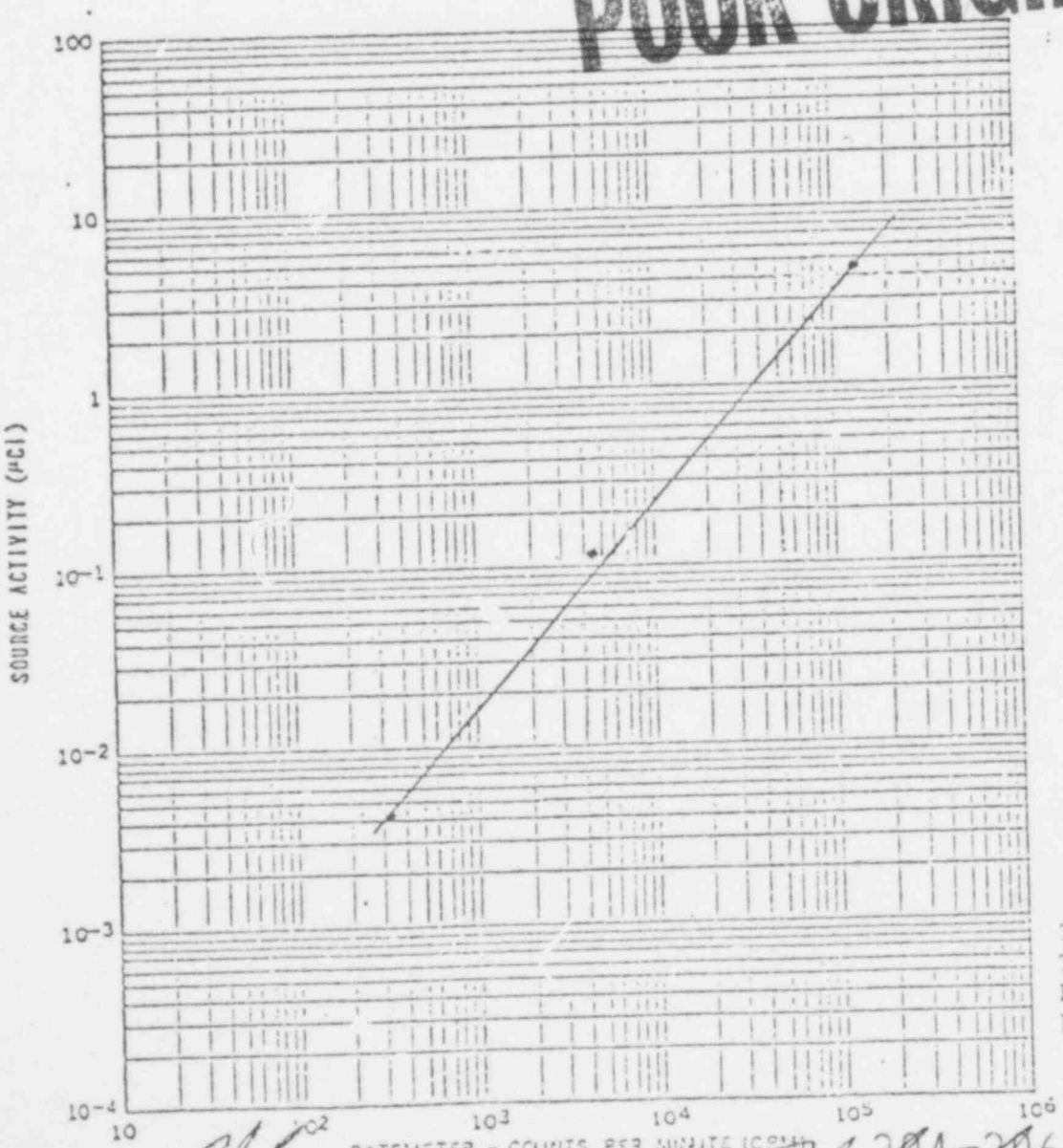
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.18	140141	JB / Met Ed	3/1/78
^{133}Ba (#D)	0.115	4253	JB / Met Ed	3/1/78
^{133}Ba (#I)	0.0041	315	JB / Met Ed	3/1/78

1. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



NAME [illegible] DATE 3/1/78 ORGANIZATION Met Ed

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER 72-R-1092

DATA SHEET NO. 10.6 PAGE 5 OF 26

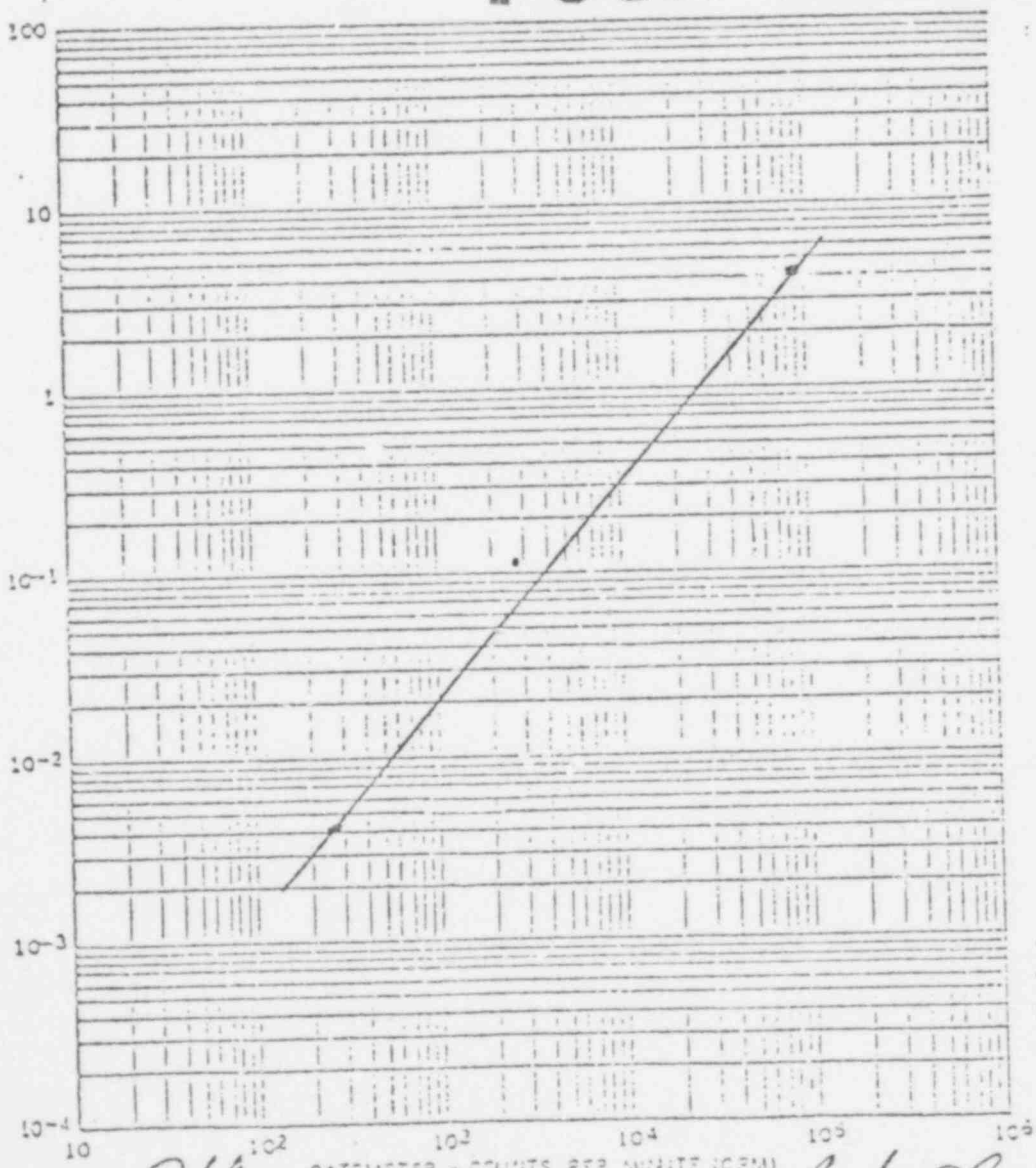
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.19	88984	JB Mat-El	3/2/78
^{133}Ba (#D)	0.115	2812	JB Mat-El	3/2/78
^{133}Ba (#E)	0.0041	287	JB Mat-El	3/2/78

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



NAME J. Brennan DATE 3/2/78 ORGANIZATION Mat-El

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THREE MILE ISLAND NUCLEAR STATION, UNIT 2

PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER	7C-R-1093

DATA SHEET NO. 10.6 PAGE 5 OF 26

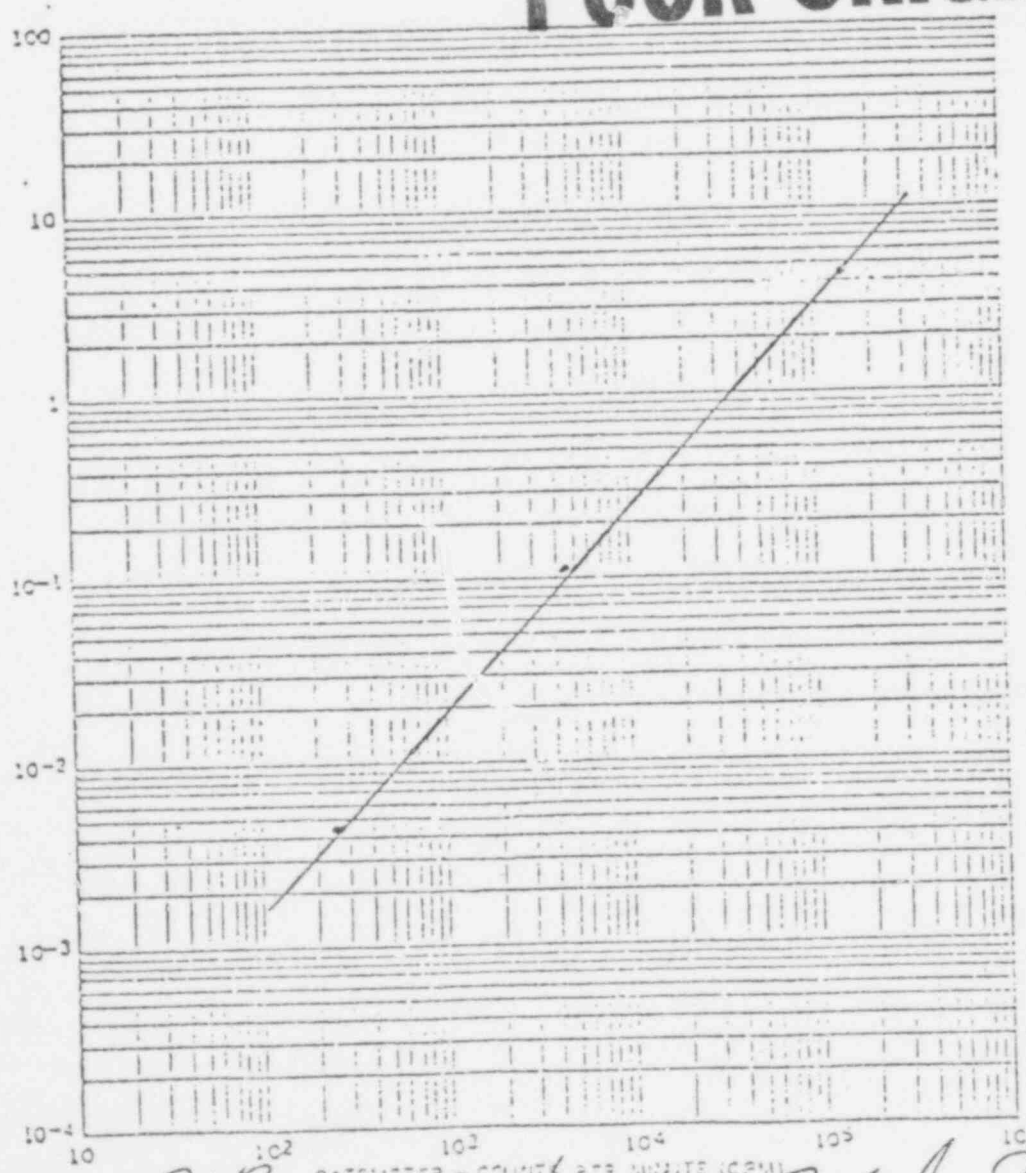
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.18	143897	[illegible]	3/2/78
^{133}Ba (#D)	0.115	4383	[illegible]	3/2/78
^{133}Ba (#E)	0.0041	253	[illegible]	3/2/78

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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NAME [illegible] DATE 3/2/78 ORGANIZATION [illegible]

THREE MILE ISLAND NUCLEAR STATION — UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER	R-1311

DATA SHEET NO. 10.6 PAGE 5 OF 26

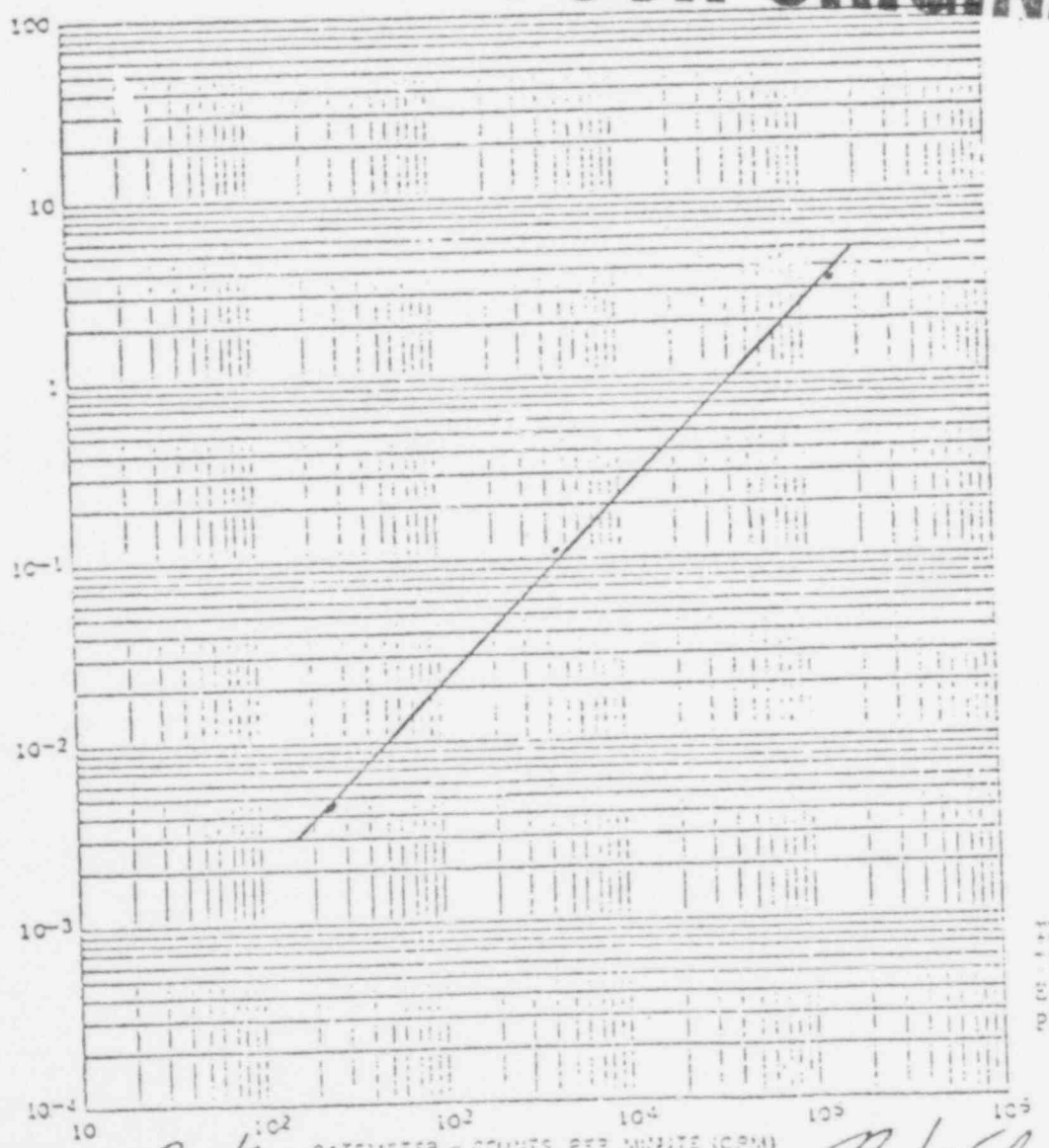
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/DEG.	DATE
^{133}Ba (#A)	4.18	44667	JB / Mt-El	3/15/78
^{133}Ba (#D)	0.215	4123	JB / Mt-El	3/15/78
^{133}Ba (#I)	0.0041	232	JB / Mt-El	3/15/78

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS MONITRATE (CPM)

POOR ORIGINAL



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NAME J. Burns DATE 3/15/78 ORGANIZATION Mt-El

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: PG-R-3359

DATA SHEET NO. 10.6 PAGE 5 OF 26

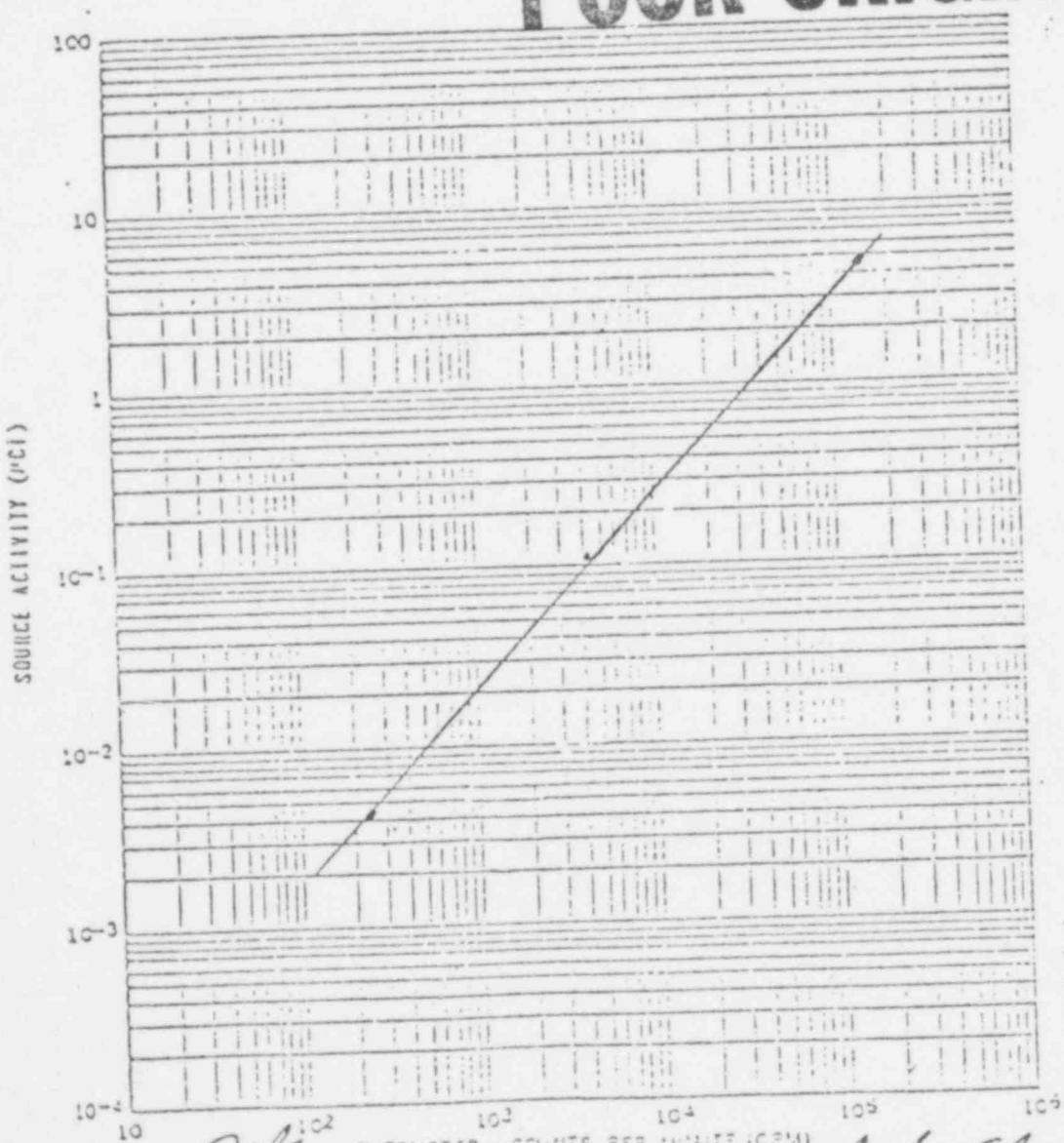
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.19	148338	[illegible]	3/25/78
^{133}Ba (#B)	0.115	4184	[illegible]	3/29/78
^{133}Ba (#C)	0.0041	253	[illegible]	3/25/78

1. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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NAME: [illegible] DATE: 3/29/78 ORGANIZATION: [illegible]

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: R-R-3400

DATA SHEET NO. 10.6 PAGE 5 OF 26

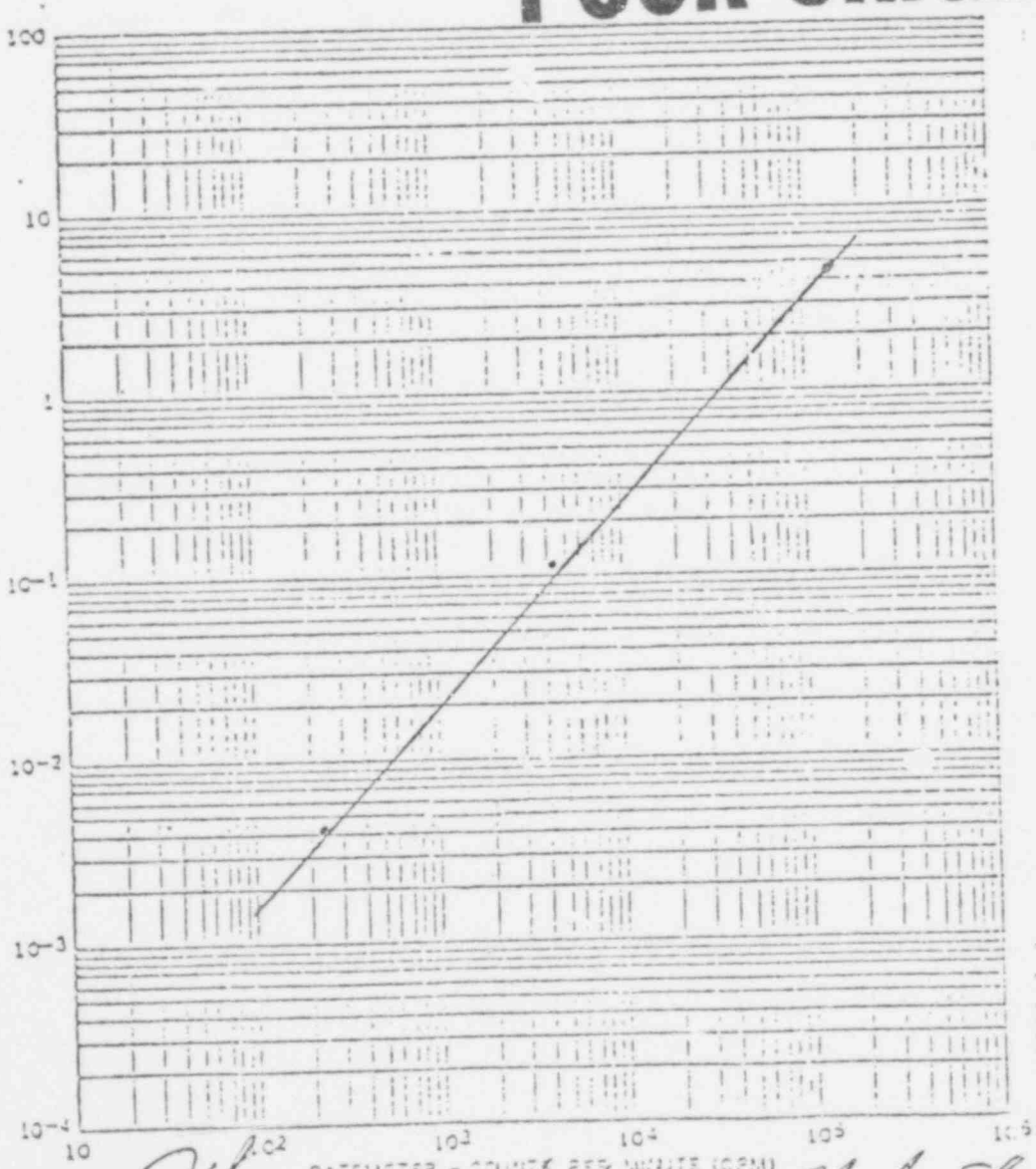
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.18	143743	JB / MET-ED	2/28/78
^{133}Ba (#D)	0.115	9287	JB / MET-ED	2/28/78
^{133}Ba (#E)	0.0041	235	JB / MET-ED	2/28/78

1. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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NAME J. Brunner DATE 2/28/78 ORGANIZATION Met-Ed

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER | MR-R-3401

DATA SHEET NO. 10.6 PAGE 5 OF 26

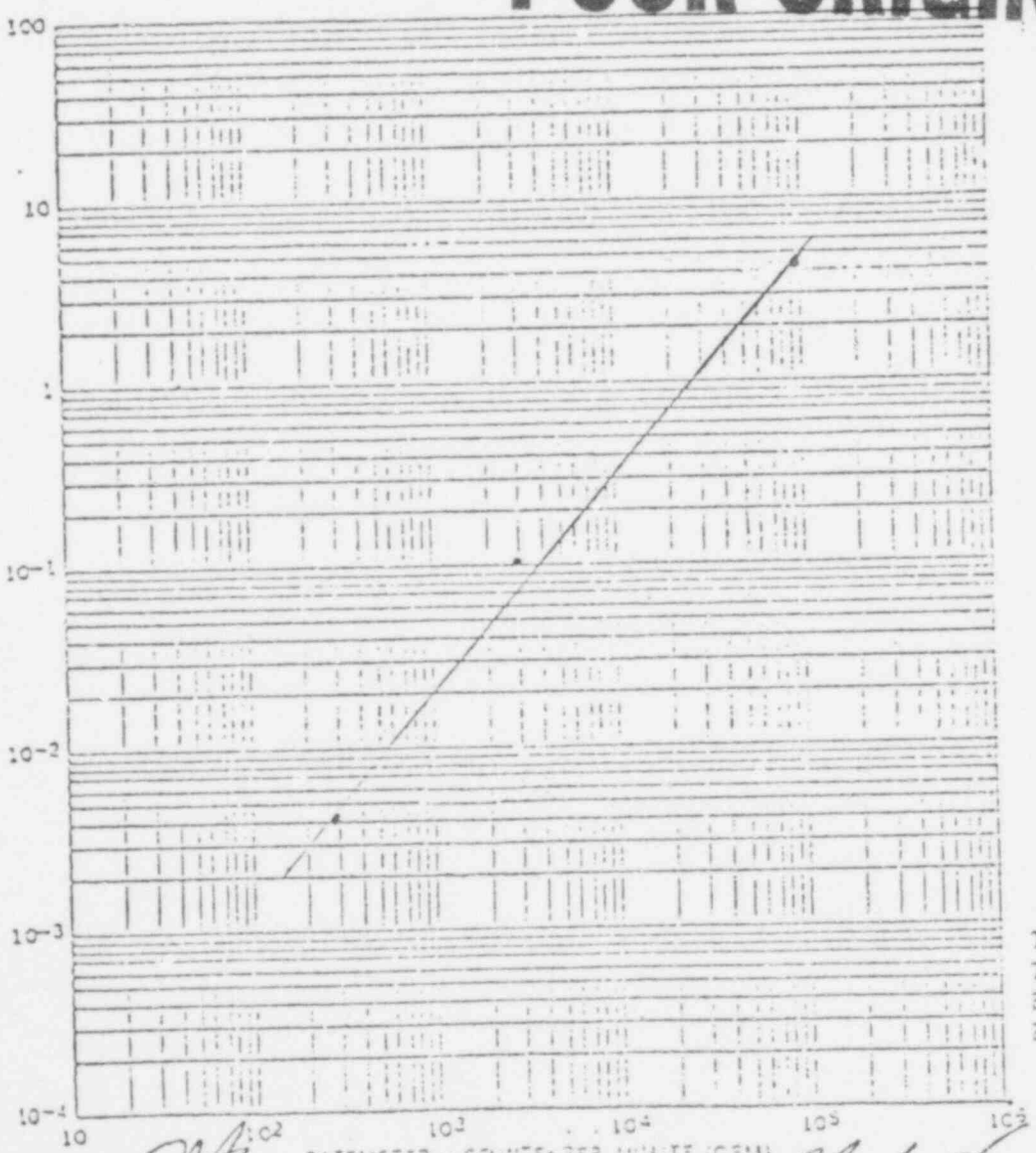
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.13	97221	JAB / Met Ed	2/29/78
^{133}Ba (#D)	0.115	2838	JAB / Met Ed	2/29/78
^{133}Ba (#E)	0.0041	294	JAB / Met Ed	2/29/78

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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NAME J. Buman DATE 2/29/78 ORGANIZATION Met Ed

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: SF-R-3401

DATA SHEET NO. 10.6 PAGE 5 OF 26

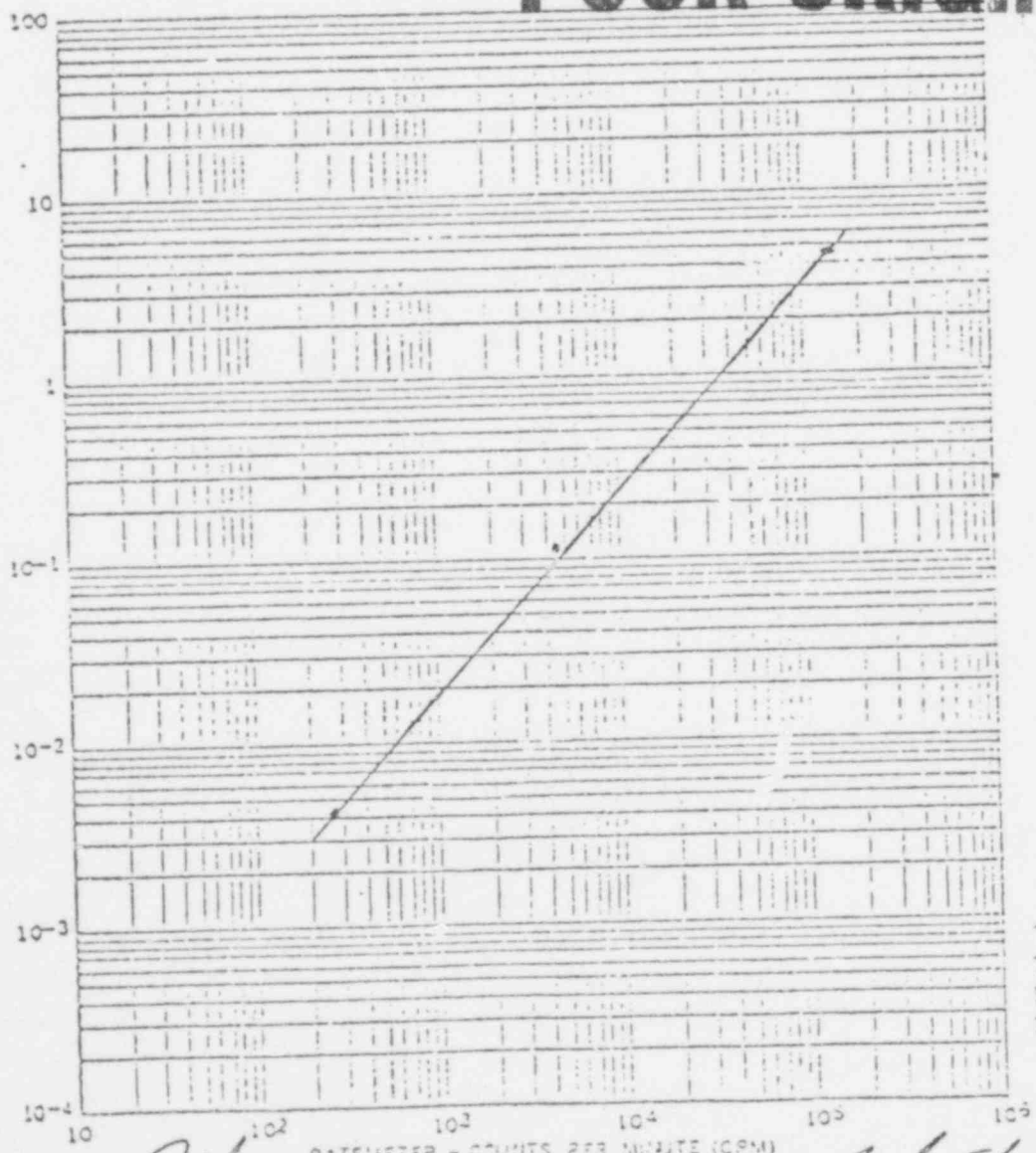
10.6.3 I. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG	DATE
^{133}Ba (#A)	4.18	147513	[illegible]	3/14/81
^{133}Ba (#D)	0.115	4557	[illegible]	3/14/81
^{133}Ba (#E)	0.0041	266	[illegible]	3/14/81

II. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS SCALERATE (CPM)

POOR ORIGINAL



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NAME [illegible] DATE 3/14/81 ORGANIZATION [illegible]

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: MT-R-[illegible]

DATA SHEET NO. 10.6 PAGE 5 OF 26

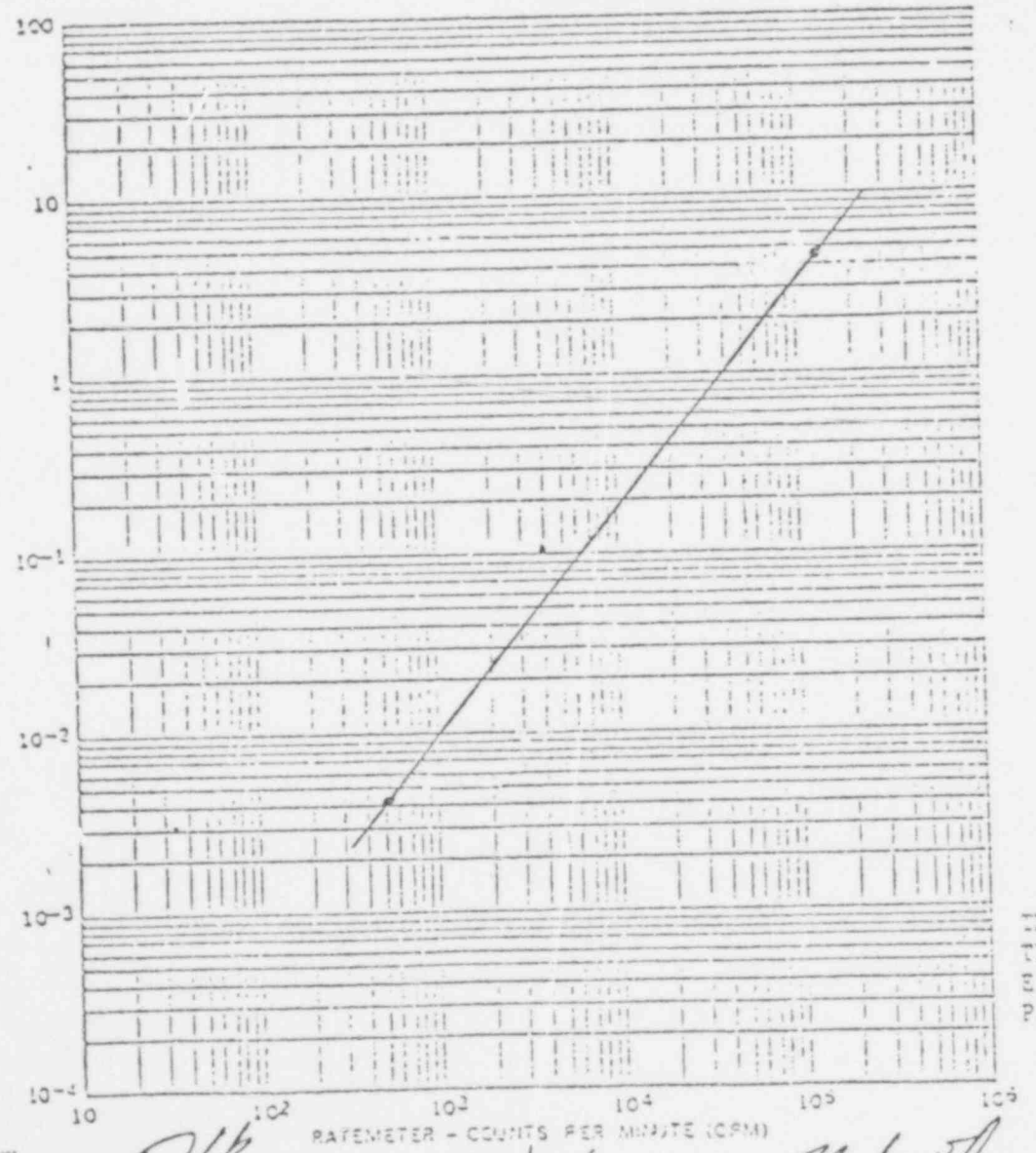
10.6.3 I. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (#A)	4.18	144903	[illegible]	3/14/78
^{133}Ba (#D)	0.215	3559	[illegible]	3/14/78
^{133}Ba (#I)	0.0041	528	[illegible]	3/14/78

II. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS RATEMETER (CPM)

POOR ORIGINAL



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NAME [illegible] DATE 3/14/78 ORGANIZATION [illegible]

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PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: 4-R-3485

DATA SHEET NO. 10.6 PAGE 5 OF 26

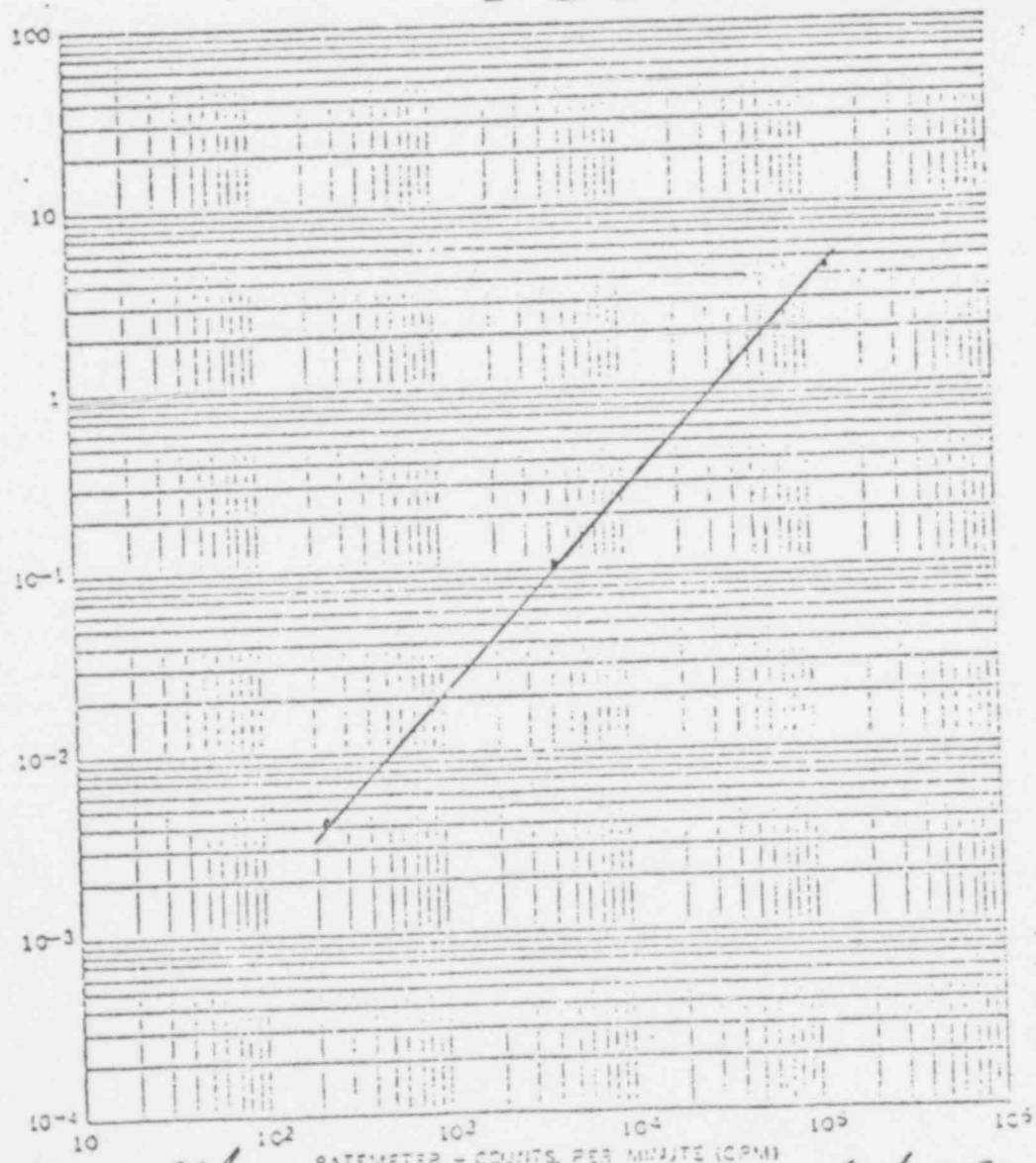
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 2)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/DATE	DATE
^{133}Ba (#A)	4.18	133021	[illegible]	2/10/78
^{133}Ba (#D)	0.115	4023	[illegible]	2/14/78
^{133}Ba (#E)	0.0041	226	[illegible]	2/14/78

1. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) AS ABOVE (CPM)

POOR ORIGINAL



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NAME [illegible] DATE 2/14/78 ORGANIZATION Met-Ed

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THREE MILE ISLAND NUCLEAR STATION UNIT 2

PROCEDURE NO.: TP 360/18
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER R-3-720

DATA SHEET NO. 10.6 PAGE 6 OF 26

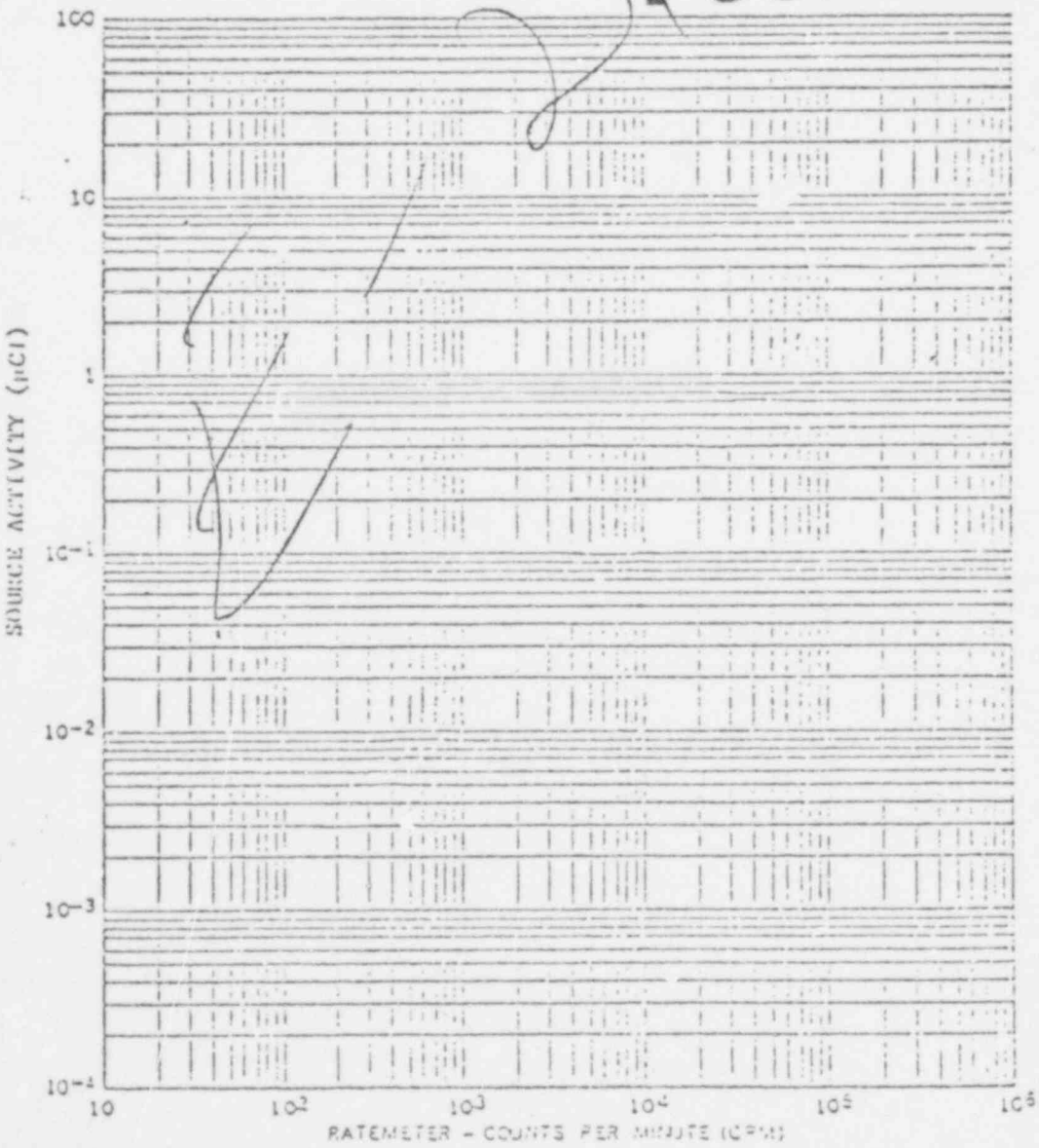
10.6.3 I. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1128)	0.0984		/	
^{133}Ba (ICN #5.43)	5.488			

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER FC-R-1091

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10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1109)	0.0984		/	
^{133}Ba (ICN #5.40)	5.455			

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL

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THREE MILE ISLAND NUCLEAR STATION / UNIT 2

PROCEDURE NO.: TP 360/18
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: IC-R-1092

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10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN A.0041)	0.0041		/	
^{133}Ba (ICN A.1109)	0.0984		/	
^{133}Ba (ICN 05.40)	5.455		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) vs COUNTRATE (CPM)

POOR ORIGINAL

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/13
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: IC-R-1095

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1120)	0.0984		/	
^{133}Ba (ICN #5.48)	5.455			

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE

POOR ORIGINAL

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THREE MILE ISLAND NUCLEAR STATION UNIT 2

PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER HPR-R-1BN

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1120)	0.0984		/	
^{133}Ba (ICN #5.40)	5.455		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER PC-R-3159

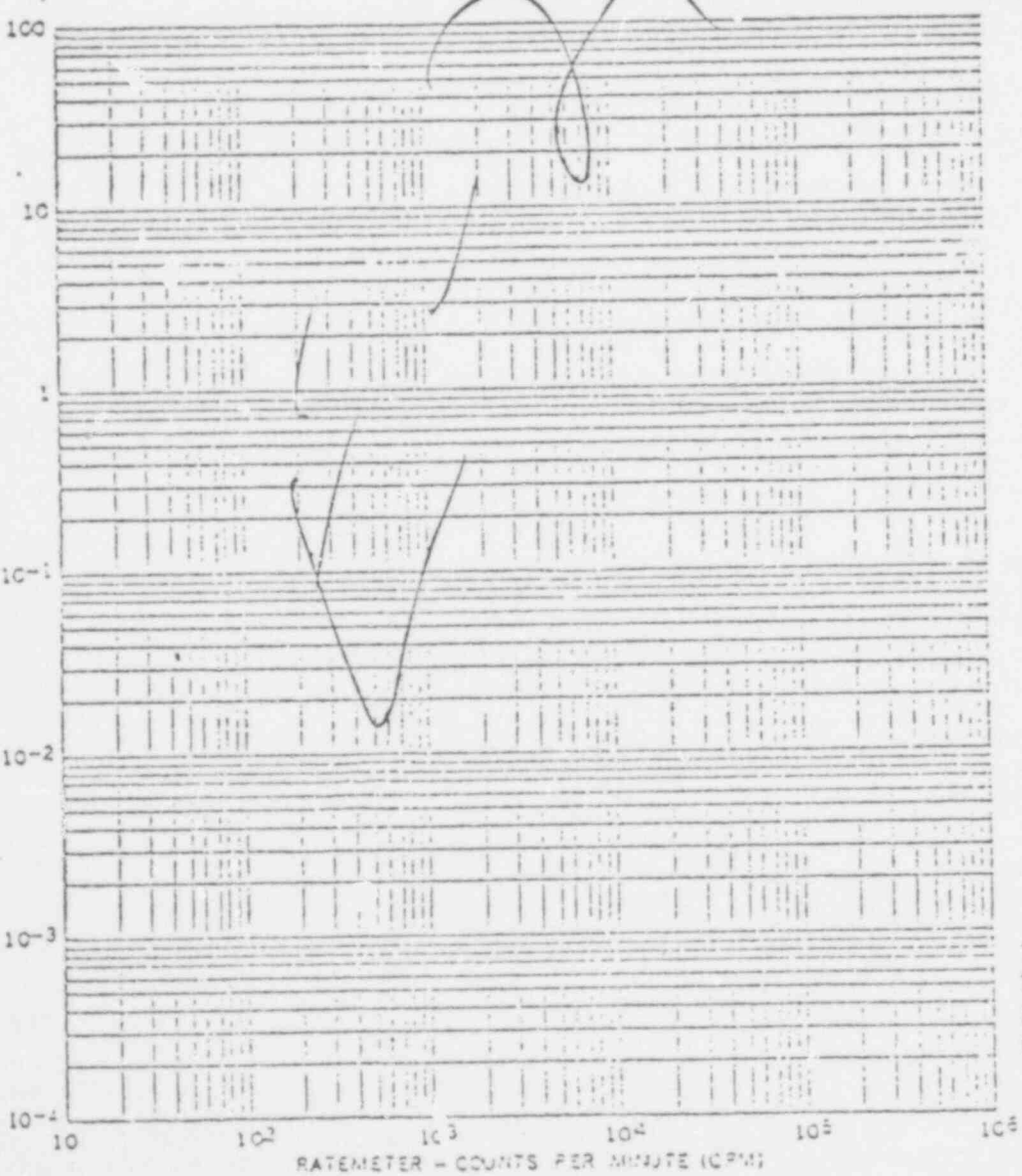
DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1109)	0.0984		/	
^{133}Ba (ICN #5.43)	5.455			

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)



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THREE MILE ISLAND NUCLEAR STATION UNIT 2

PROCEDURE NO.: TP 360/12
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER RC-R-3400

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/DATE	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1123)	0.0984		/	
^{133}Ba (ICN #5.43)	5.455		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

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THREE MILE ISLAND NUCLEAR STATION - UNIT 2

PROCEDURE NO.: TP 360/1B
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER MS-R-2404

DATA SHEET NO. 10.6 PAGE 6 OF 26

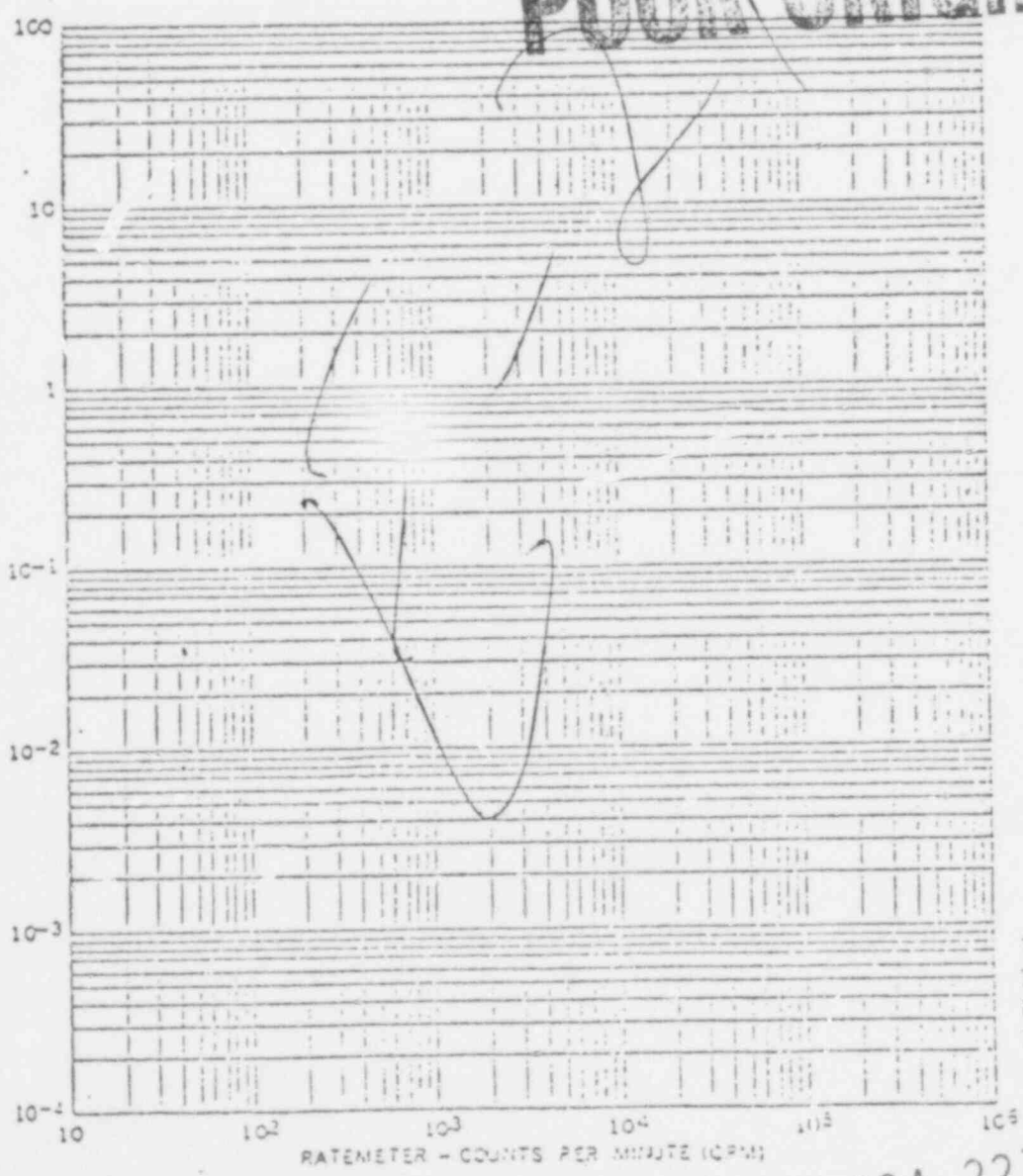
10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN 8.0041)	0.0041		/	
^{133}Ba (ICN 8.1100)	0.0984		/	
^{133}Ba (ICN 45.40)	5.455		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

POOR ORIGINAL



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THREE MILE ISLAND NUCLEAR STATION UNIT 2

PROCEDURE NO.: TP 360/18
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER: RE-R-3402

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1103)	0.0984		/	
^{133}Ba (ICN #5.40)	5.455			

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

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PROCEDURE NO.: TP 360/18
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER MT-R-3694

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1120)	0.0984		/	
^{133}Ba (ICN #5.40)	5.455		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba SOURCES) VS COUNTRATE (CPM)

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THREE MILE ISLAND NUCLEAR STATION UNIT 2

PROCEDURE NO.: TP 360/18
PROCEDURE TITLE: PROCESS RADIATION MONITOR CALIB. AND FUNCTIONAL TEST FOR LIQUID MONITORS

RADIATION MONITOR CHANNEL NUMBER HT-R-3155

DATA SHEET NO. 10.6 PAGE 6 OF 26

10.6.3 1. LINEARITY DATA (USING SOURCES) (Unit 1)

10.6.5

SOURCE	ACTIVITY (μCi)	CPM	INITIALS/ORG.	DATE
^{133}Ba (ICN #.0041)	0.0041		/	
^{133}Ba (ICN #.1103)	0.0994		/	
^{133}Ba (ICN #5.40)	5.40		/	

2. PLOT OF SOURCE ACTIVITY (^{133}Ba, DECAYED) VS SCALER (CPM)

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1. Channel Description - IC-R-1091

2. Equipment

	CHANNEL NO.	MODEL NO.	SERIAL NO.
Sampler	IC-R-1091	841-34	N/A
Detector	IC-R-1091	843-30	178
Ratemeter	IC-R-1091	842-10	663

10.6.4.3 Calibration Data
IC-R-1091 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM CROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	534	10	186237	2	186237	186130	223491	186283	1.8x10^5	1.8x10^5	[illegible]	3/1/78
137 CS(No.177)	534	10	130194	2	130194 ~~130087~~	130087	134673	126568	1.2x10^5	1.2x10^5	[illegible]	3/1/78
133 BA(No.138)	534	10	190430	2	190430	190323	N/A	N/A	1.9x10^5	1.9x10^5	[illegible]	3/1/78
137 CS(No.138)	534	10	79342	2	79342	79235	N/A	N/A	8x10^4	8x10^4	[illegible]	3/1/78
133 BA(No.192)	534	10	278020	2	278020	277913	N/A	N/A	2.8x10^5	2.8x10^5	[illegible]	3/1/78
137 CS(No.192)	534	10	99655	2	99655	99548	N/A	N/A	10^5	10^5	[illegible]	3/1/78

10.6.4.4
IC-R-1091 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	655	20	180635	2	180635	179970	226660	189028	1.8x10^5	1.8x10^5	[illegible]	3/1/78
137 CS (No.177)	655	20	126523	2	126523	125868	139803	131131	1.3x10^5	1.2x10^5	[illegible]	3/1/78
133 BA(No.138)	655	20	180305	2	180305	180240	N/A	N/A	1.8x10^5	1.8x10^5	[illegible]	3/1/78
137 CS(No.138)	655	20	77345	2	77345	77780	N/A	N/A	7.8x10^4	7.8x10^4	[illegible]	3/1/78
133 BA(No.192)	655	20	268371	2	268371	268306	N/A	N/A	2.7x10^5	2.7x10^5	[illegible]	3/1/78
137 CS(No.192)	655	20	96831	2	96831	96766	N/A	N/A	9.7x10^4	9.7x10^4	[illegible]	3/1/78

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10.6.4.3.2 IC-R-1091 Ratemeter

	Factory	Actual	Initial/Org.	DATE
Clip Voltage	.20	.2 VDC	[illegible]	3/2/78

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1. Channel Description - IC-R-1092

2. Equipment

	CHANNEL NO.	MODEL NO.	SERIAL NO.
Sampler	IC-R-1092	841-34	N/A
Detector	IC-R-1092	843-30	173
Ratemeter	IC-R-1092	842-10	751

10.6.4.3 Calibration Data
IC-R-1092 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	487	10	173929 ~~176787~~	2	173929 ~~176787~~	173832 ~~176684~~	210229	175322	1.8x10^5	1.8x10^5	JHHold	3/2/78
137 CS(No.177)	487	10	129128 ~~132864~~	2	129128 ~~132864~~	128031 ~~132767~~	137121	128665	1.2x10^5	1.2x10^5	JHHold	3/2/78
133 BA(No.138)	487	10	172688	2	172688	172591	N/A	N/A	1.7x10^5	1.8x10^5	JHHold	3/2/78
137 CS(No.138)	487	10	78873	2	78873	78776	N/A	N/A	7.8x10^4	7.8x10^4	JHHold	3/2/78
133 BA(No.192)	487	10	261895 ~~266335~~	2	261895 ~~266335~~	261798 ~~266238~~	N/A	N/A	2.6x10^5	2.6x10^5	JHHold	3/2/78
137 CS(No.192)	487	10	97854	2	97854	97757	N/A	N/A	10^5	10^5	JHHold	3/2/78

10.6.4.4
IC-R-1092 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	1276	10	169283	2	169282	164048	224657	187355	1.6x10^5	1.6x10^5	JHHold	3/2/78
137 CS (No.177)	1276	10	123505	2	123505	123250	137641	124153	1.2x10^5	1.2x10^5	JHHold	3/2/78
133 BA(No.138)	1276	10	171682	2	171682	171427	N/A	N/A	1.7x10^5	1.7x10^5	JHHold	3/2/78
137 CS(No.138)	1276	10	73072	2	73072	72817	N/A	N/A	7x10^4	7x10^4	JHHold	3/2/78
133 BA(No.192)	1276	10	255807	2	255807	255552	N/A	N/A	2.6x10^5	2.6x10^5	JHHold	3/2/78
137 CS(No.192)	1276	10	90539	2	90539	90284	N/A	N/A	8x10^4	8x10^4	JHHold	3/2/78

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10.6.4.3.2 IC-R-1092 Ratemeter

	Factory	Actual	Initial/Org.	DATE
Clip Voltage	.20	.02 VDC	[illegible]	3/12/8

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1. Channel Description - IC-R-1093

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	IC-R-1093	842-33	N/A
Detector	IC-R-1093	843-30	180
Ratemeter	IC-R-1093	842-10	683

10.6.4.3 Calibration Data
IC-R-1093 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPH GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
	641	10	193140		193140	193017		192109	2.0×10^5	2.1×10^5	[illegible]	8/1/78
133 BA(No.177)	135	2	202864	2	2×10^5 195105	202726	230352	193173	194865	199865	[illegible] (NEC)	8 Jan 77
	641	10	131661		131661	131661		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
137 CS(No.177)	142	2	128660	2	1.2×10^5 128105	128518	133737	125706	119858	119858	[illegible] (NEC)	8 Jan 77
133 BA(No.138)	641	10	166046	2	178046	146523	N/A	N/A	1.9×10^5	2.0×10^5	[illegible]	[illegible]
137 CS(No.138)	641	10	80583	2	80583	80160	N/A	N/A	9×10^4	10×10^4	[illegible]	[illegible]
133 BA(No.192)	641	10	281211	2	281211	291043	N/A	N/A	5×10^5	3×10^5	[illegible]	[illegible]
137 CS(No.192)	641	10	100522	2	100522	100397	N/A	N/A	1×10^5	1.1×10^5	[illegible]	[illegible]

10.6.4.4
IC-R-1093 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	450	10	184245	2	184245	184155	232963	191181	2.3×10^5	[illegible]	[illegible]	[illegible]
137 CS (No.177)	450	10	129203	2	129203	129113	139390	139942	1.2×10^5	1.2×10^5	[illegible]	[illegible]
133 BA(No.138)	450	10	188124	2	188124	188034	N/A	N/A	1.9×10^5	2×10^5	[illegible]	3/1/78
137 CS(No.138)	450	10	27667	2	27667	27572	N/A	N/A	8×10^4	8.2×10^4	[illegible]	3/1/78
133 BA(No.192)	450	10	281211	2	281211	281121	N/A	N/A	2×10^5	3×10^5	[illegible]	3/1/78
137 CS(No.192)	450	10	27859	2	27859	27769	N/A	N/A	8×10^4	8×10^4	[illegible]	3/1/78

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10.6.4.3.2 IC-R-1093 Ratemeter

	Factory	Actual	Initial/Orz.	DATE
Clip Voltage	.20	.21 VDC	7RB	8Jan.78

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DATA SHEET NO. 10.6

1. Channel Description - WDL-R-1311

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	WDL-R-1311	841-33	N/A
Det .tor	WDL-R-1311	843-30	199
Ratemeter	WDL-R-1311	842-10	675

10.6.4.3 Calibration Data

WDL-R-1311 Ratemeter & Sampler.

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CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	Recorder Reading (Gross)	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	1605	20	180865	2	1.9x10^5	1.6x10^5	180705 ~~180865~~ TRB	219967	184464	159840	189840	TRB(MEC)	7Jan.78
137 CS(No.177)	160	2	123194	2	1.2x10^5	1.1x10^5	123034	125423	117898	109840	119840	TRB(MEC)	7Jan.78
133 BA(No.138)	164	2	183253	2	1.9x10^5	1.7x10^5	183089	N/A	N/A	169836	189836	TRB(MEC)	7Jan.78
137 CS(No.138)	157	2	75934	2	8x10^4	7x10^4	75577	N/A	N/A	69843	79843	TRB(MEC)	7Jan.78
133 BA(No.192)	227	10	277479	2	TRB 1.8x10^5	TRB 1.6x10^5 277479	277317	N/A	N/A	3x10^5	3x10^5	[illegible]	3/[illegible]
137 CS(No.192)	227	10	94829	2	/	94829	94664	N/A	N/A	9x10^4	9x10^4	[illegible]	3/[illegible]

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~~133 Ba 177~~ 10.6.4.4 ~~87 7 2M 10 AA~~

WDL-R-1311 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	103	2	173047	2	1.8x10^5	1.6x10^5	172944	222764	186809	159897	179897	TRB(MEC)	7Jan.78
137 CS (No.177)	105	2	117459	2	1.2x10^5	105	117354	129595	121819	99895	109895	TRB(MEC)	7Jan.78
133 BA(No.138)	106	2	175500	2	1.8x10^5	1.6x10^5	175394	N/A	N/A	159894	179894	TRB(MEC)	7Jan 78
137 CS(No.138)	106	2	70553	2	7x10^4	6x10^4	70447	N/A	N/A	59894	69894	TRB(MEC)	7Jan.78
133 BA(No.192)	534	10	168995	2		168472	168885	N/A	N/A	2.8x10^5	3.8x10^5	[illegible]	3/[illegible]
137 CS(No.192)	534	10	92374	2		92374	92267	N/A	N/A	8x10^4	8x10^4	[illegible]	3/[illegible]

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10.6.4.3.2 WDL-R-1311 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.20VDC	TJW	1/6/78

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DATA SHEET NO. 10.6

1. Channel Description - DC-R-3399

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	DC-R-3399	841-33	N/A
Detector	DC-R-3399	843-30	187
Ratemeter	DC-R-3399	842-10	678

10.6.4.3 Calibration Data
DC-R-3399 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM CROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	560 ~~585~~	10	191842	2	191842	191730	226945	184263 ~~192286~~	1.8x10^5	1.8x10^5	JH	2/28/78
137 CS(No.177)	560	10	132735	2	132735	132875	134878	126560	1.3x10^5	1.3x10^5	JH	2/28/78
133 BA(No.138)	560	10	203715	2	203715	203603	N/A	N/A	1.9x10^5	1.9x10^5	JH	2/28/78
137 CS(No.138)	560	10	82178	2	82178	82066	N/A	N/A	8x10^4	8x10^4	JH	2/28/78
133 BA(No.192)	560	10	290341	3	290341	290219	N/A	N/A	2.9x10^5	2.9x10^5	JH	2/28/78
137 CS(No.192)	560	10	133710	2	133710	133598	N/A	N/A	1.3x10^5	1.3x10^5	JH	2/28/78

10.6.4.4
DC-R-3399 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	419	10	192556	2	192556	192474	229378	191392	1.8x10^5	1.8x10^5	JH	2/28/78
137 CS (No.177)	419	10	131955	2	131955	131871	140539	131872	1.3x10^5	1.3x10^5	JH	2/28/78
133 BA(No.138)	419	10	197457	2	197457	197375	N/A	N/A	1.8x10^5	1.8x10^5	JH	2/28/78
137 CS(No.138)	419	10	78457	2	78457	78375	N/A	N/A	7.5x10^4	7.5x10^4	JH	2/28/78
133 BA(No.192)	419	10	292740	2	2	292658	N/A	N/A	2.8x10^5	2.8x10^5	JH	2/28/78
137 CS(No.192)	419	10	99626	2	99626	99542	N/A	N/A	9x10^4	9x10^4	JH	2/28/78

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10.6.4.3.2 DC-R-3399 Ratemeter

	Factory	Actual	Initial/Orz.	Date
Clip Voltage	.20	.20 VDC	RJW.	12/7/77

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DATA SHEET NO. 10.6

1. Channel Description - DC-R-3400

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	DC-R-3400	841-33	N/A
Detector	DC-R-3400	843-30	198
Ratemeter	DC-R-3400	842-10	739

10.6.4.3 Calibration Data
DC-R-3400 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	531	10	194190	2	194190	194224	231575	193129	195x10^3	1.5x10^5	[illegible]	[illegible]
137 CS(No.177)	531	10	133304	2	133304	132735	133612	129651	1.5x10^5	1.3x10^5	[illegible]	[illegible]
133 BA(No.138)	531	10	203593	2	203593	203519	N/A	N/A	195x10^3	20x10^5	[illegible]	[illegible]
137 CS(No.138)	531	10	80271	2	80271	80205	N/A	N/A	70x10^3	80x10^3	[illegible]	[illegible]
133 BA(No.192)	531	10	218597	2	218597	218554	N/A	N/A	3x10^5	2.1x10^5	[illegible]	[illegible]
137 CS(No.192)	531	10	82547	2	82547	82483	N/A	N/A	65^3	80x10^3	[illegible]	[illegible]

10.6.4.4
DC-R-3400 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	132	10	192618	2	192618	192552	235367	196286	1x10^5	2x10^5	[illegible]	[illegible]
137 CS (No.177)	132	10	131087	2	131087	130803	139342	132252	1.3x10^5	1.3x10^5	[illegible]	[illegible]
133 BA(No.138)	132	10	172863	2	172863	172577	N/A	N/A	1.7x10^5	18x10^5	[illegible]	[illegible]
137 CS(No.138)	132	10	75519	2	75519	75493	N/A	N/A	80x10^3	8x10^3	[illegible]	[illegible]
133 BA(No.192)	132	10	291319	2	291314	291228	N/A	N/A	40^5	3x10^5	[illegible]	[illegible]
137 CS(No.192)	132	10	95991	2	95991	95911	N/A	N/A	1x10^5	1x10^5	[illegible]	[illegible]

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10.6.4.3.2 DC-R-3400 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.20 VDC	JDW ME	12/7/77

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DATA SHEET NO. 10.6

1. Channel Description - NS-R-3401

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	NS-R-3401	841-33	N/A
Detector	NS-R-3401	843-30	195
Ratemeter	NS-R-3401	842-10	722

10.6.4.3 Calibration Data
NS-R-3401 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	[illegible]	10	179316	2	179316	179242	214690	17[illegible]42	1.8×10^5	1.8×10^5	[illegible]	[illegible]
137 CS(No.177)	[illegible]	10	130282	2	130282	129878	134024	125[illegible]8	1.2×10^5	1.2×10^5	[illegible]	[illegible]
133 BA(No.138)	[illegible]	10	183556	2	183556	183504	N/A	N/A	2×10^5	2×10^5	[illegible]	[illegible]
137 CS(No.138)	[illegible]	10	78401	2	78401	78297	N/A	N/A	8×10^4	8×10^4	[illegible]	[illegible]
133 BA(No.192)	[illegible]	10	268776	2	268776	268622	N/A	N/A	2.5×10^5	2.5×10^5	[illegible]	[illegible]
137 CS(No.192)	[illegible]	10	98403	2	98403	98249	N/A	N/A	9×10^4	9.5×10^4	[illegible]	[illegible]

10.6.4.4
NS-R-3401 Ratemeter & Standard Calibration Fixtur.

133 BA (No.177)	[illegible]	10	175555	2	175555	56.52	220944	164755	1.8×10^5	[illegible]	[illegible]	[illegible]
137 CS (No.177)	[illegible]	10	126655	2	126655	26455	139327	50955	1.2×10^5	1.2×10^5	[illegible]	[illegible]
133 BA(No.138)	[illegible]	10	176113	2	176113	175910	N/A	N/A	1.8×10^5	1.8×10^5	[illegible]	[illegible]
137 CS(No.138)	[illegible]	10	75723	2	75723	75500	N/A	N/A	8×10^4	8×10^4	[illegible]	[illegible]
133 BA(No.192)	[illegible]	10	265425	2	265425	264922	N/A	N/A	2.6×10^5	2.6×10^5	[illegible]	[illegible]
137 CS(No.192)	[illegible]	10	95[illegible]	2	95[illegible]	9557	N/A	N/A	9×10^4	9×10^4	[illegible]	[illegible]

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10.6.4.3.2 NS-R-3401 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.2 VDC	[illegible]	[illegible]

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DATA SHEET NO. 10.6

1. Channel Description - SF-R-3402

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	SF-R-3402	841-34	N/A
Detector	SF-R-3402	843-30	165
Ratemeter	SF-R-3402	842-10	753

10.6.4.3 Calibration Data
SF-R-3402 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	514	10	194938	2	194938	194835	233843	195958	1.3x10^5	1.3x10^5	[illegible]	3/1/78
137 CS(No.177)	514	10	135522	2	135522	133419	135882	127417	1.3x10^5	1.3x10^5	[illegible]	3/1/78
133 BA(No.138)	514	10	200281	2	200281	200178	N/A	N/A	2.0x10^5	2x10^5	[illegible]	3/1/78
137 CS(No.138)	514	10	81269	2	81269	81166	N/A	N/A	8.3x10^4	8.3x10^4	[illegible]	3/1/78
133 BA(No.192)	514	10	294880	2	294880	294777	N/A	N/A	3x10^5	3x10^5	[illegible]	3/1/78
137 CS(No.192)	514	10	101622	2	101622	101569	N/A	N/A	1.0x10^5	9x10^4	[illegible]	3/1/78

10.6.4.4
SF-R-3402 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	521	20	190481	2	190481	190389	235988	195716	2x10^5	2x10^5	[illegible]	3/1/78
137 CS (No.177)	521	20	130786	2	130786	130694	141265	132555	1.3x10^5	1.3x10^5	[illegible]	[illegible]
133 BA(No.138)	521	20	196047	2	196047	195955	N/A	N/A	1.9x10^5	1.9x10^5	[illegible]	3/1/78
137 CS(No.138)	521	20	79217	2	79217	79127	N/A	N/A	7.5x10^4	7.5x10^4	[illegible]	3/1/78
133 BA(No.192)	521	20	291751	2	291739	291647	N/A	N/A	3x10^5	3x10^5	[illegible]	3/1/78
137 CS(No.192)	521	20	100131	2	100134 / 100047	100092	N/A	N/A	10^5	9x10^4	[illegible]	3/1/78

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10.6.4.3.2 SF-R-3402 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.2 VDC	[illegible]	3/12/78

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DATA SHEET NO. 10.6

1. Channel Description - WT-R-3894

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	WT-R-3894	841-34	N/A
Detector	WT-R-3894	843-30	151
Ratemeter	WT-R-3894	842-10	673

10.6.4.3 Calibration Data
WT-R-3894 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	23	2	187506	2	187506	186483	220196	186712	1.8x10^5	E-26 E-28	JAME	3/1/78
137 CS(No.177)	23	2	130946	2	130946	130923	134300	126668	1.3x10^5		JAME	3/1/78
133 BA(No.138)	23	2	191617	2	191617	190594	N/A	N/A	1.9x10^5		JAME	3/1/78
137 CS(No.138)	23	2	71713	2	71713	71690	N/A	N/A	7.5x10^4		JAME	3/1/78
133 BA(No.192)	23	2	283104	2	283104	283081	N/A	N/A	3x10^5		JAME	3/1/78
137 CS(No.192)	23	2	98910	2	98910	98887	N/A	N/A	1.5x10^4		JAME	3/1/78

10.6.4.4
WT-R-3894 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	304	2	187178	2	187178	186874	222824	188441	1.9x10^5	E-26 E-28	JAME	3/1/78
137 CS (No.177)	304	2	128027	2	128027	127723	138630	130055	1.2x10^5		JAME	3/1/78
133 BA(No.138)	304	2	190147	2	190147	190143	N/A	N/A	1.9x10^5		JAME	3/1/78
137 CS(No.138)	304	2	71052	2	71052	70748	N/A	N/A	7.5x10^4		JAME	3/1/78
133 BA(No.192)	304	2	282932	2	282932	282628	N/A	N/A	2.8x10^5		JAME	3/1/78
137 CS(No.192)	304	2	97327	2	97327	97023	N/A	N/A	1.5x10^4		JAME	3/1/78

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10.6.4.3.2 WT-R-3894 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.2 VDC	[illegible]	[illegible]

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DATA SHEET NO. 10.6

1. Channel Description - WT-R-3895

2. Equipment

	Channel No.	Model No.	Serial No.
Sampler	WT-R-3895	841-34	N/A
Detector	WT-R-3895	843-30	290
Ratemeter	WT-R-3895	842-10	750

10.6.4.3 Calibration Data
WT-R-3895 Ratemeter & Sampler.

CALIBRATION SOURCE & SERIAL NO.	BACKGROUND BINARY COUNTS	BACKGROUND MINUTES	SOURCE COUNT BINARY COUNTS	SOURCE COUNT MINUTES	CPM GROSS	SCALER CORRECTED SOURCE READING (CPM)	ORIGINAL SOURCE READING (CPM)	EXPECTED SOURCE READING (CPM)	RATEMETER CORRECTED SOURCE READING (CPM)	RECORDER CORRECTED SOURCE READING (CPM)	INIT/ORG	DATE
133 BA(No.177)	586	20	185652	2	185652	185535	222119	185235	1.5×10^5	1.8×10^5	JH HE	3/12/78
137 CS(No.177)	586	20	131173	2	131172	131065	133200	127985	1.2×10^5	1.4×10^5	JH HE	3/12/78
133 BA(No.138) 192	586	20	268253	2	268253	268656	N/A	N/A	2.5×10^5	2.6×10^5	JH HE	3/12/78
137 CS(No.138) 192	586	20	98381	2	98382	98165	N/A	N/A	9.8×10^4	10^5	JH HE	3/12/78
133 BA(No.192) 138	586	20	79151	2	79151	79034	N/A	N/A	7.5×10^4	8×10^4	JH HE	3/12/78
137 CS(No.192) 138	586	20	165204	2	165204	165087	N/A	N/A	1.6×10^5	1.7×10^5	JH HE	3/12/78

10.6.4.4
WT-R-3895 Ratemeter & Standard Calibration Fixture.

133 BA (No.177)	583	10	184863	2	184863	184767	225041	187675	1.8×10^5	1.9×10^5	JH HE	3/12/78
137 CS (No.177)	583	10	128917	2	128917	128796	138429	129872	1.3×10^5	1.3×10^5	JH HE	3/12/78
133 BA(No.138)	583	10	75264	2	75264	75148	N/A	N/A	7×10^4	8×10^4	JH HE	3/12/78
137 CS(No.138)	583	10	151971	2	151971	151855	N/A	N/A	1.5×10^5	1.6×10^5	JH HE	3/12/78
133 BA(No.192)	583	10	275219	2	275219	275103	N/A	N/A	2.8×10^5	2.6×10^5	JH HE	3/12/78
137 CS(No.192)	583	10	97205	2	97205	97089	N/A	N/A	9.7×10^4	10^5	JH HE	3/12/78

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DATA SHEET NO. 10.6

10.6.4.3.2 WT-R-3895 Ratemeter

	Factory	Actual	Initial/Org.	Date
Clip Voltage	.20	.2 VDC	[illegible]	3/5/76

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.1 .1.1	WDL-R1311 Alert Alarm is off	off	OFF	JB Mat/El	1/25/78
10.7.1 .1.3	"Radiation Monitoring System Trouble" Alarm on	on	ON	JB Mat/El	1/25/78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.2.1.1	MU-R-720 (Gross) - "Alert" set point	S.P. 100 Set 100	N/A YES	JH verified	3/14/78
	MU-R-720 (Gross) - "High" setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH verified	3/14/78
	MU-R-720 (Iodine) "Alert" Setpoint	S.P. 100 Set 100 YES	N/A YES	JH verified	3/14/78
	MU-R-720 (Iodine) "High" Setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH verified	3/14/78
	1C-R-1091 "Alert" Setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH verified	3/3/78
	1C-R-1091 "High" Setpoint	S.P. 5000 Set 5000 YES	N/A YES	JH verified	3/3/78
	1C-R-1092 "Alert" Setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH verified	3/3/78
	1C-R-1092 "High" Setpoint	S.P. 5000 Set 5000 YES	N/A YES	JH verified	3/3/78
	1C-R-1093 "Alert" Setpoint	S.P. 400 Set 400 YES	N/A YES	TRH (MEC)	8 Jan. 78
	1C-R-1093 "High" Setpoint	S.P. 2000 Set 2000 YES	N/A YES	TRH (MEC)	8 Jan. 78
	WDL-R-1311 "Alert" Setpoint	S.P. 1800 Set 1800 YES	N/A YES	TRH (MEC)	7 Jan. 78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.2.1.1	WDL-R-1311 "High" Setpoint	S.P. 9000 Set 9000 YES	N/A YES	DRH (MEC)	7 Jan. 78
	DC-R-3399 "Alert" Setpoint	S.P. 400 Set 400	N/A YES	JH mated	3/14/78
	DC-R-3399 "High" Setpoint	S.P. 2000 Set 2000 YES	N/A YES	JH mated	3/14/78
	DC-R-3400 "Alert" Setpoint	S.P. 400 Set 400 YES	N/A YES	JH mated	3/14/78
	DC-R-3400 "High" Setpoint	S.P. 2000 Set 2000 YES	N/A YES	JH mated	3/14/78
	NS-R-3401 "Alert" Setpoint	S.P. 400 Set 400 YES	N/A YES	JH mated	27 Feb 78
	NS-R-3401 "High" Setpoint	S.P. 2000 Set 2000 YES	N/A. YES	JH mated	27 Feb 78
	SF-R-3402 "Alert" Setpoint	S.P. 100 Set 100 YES	N/A YES	JH mated	3/14/78
	SF-R-3402 "High" Setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH mated	3/14/78
	WT-R-3894 "Alert" Setpoint	S.P. 1000 Set 1000 YES	N/A YES	JH mated	3/14/78
	WT-R-3894 "High" Setpoint	S.P. 2000 Set 2000 YES	N/A YES	JH mated	3/14/78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.2.1.1 (Cont'd)	WT-R-3895 "Alert" Setpoint	S.P. 750 Set 750 YES	N/A YES	JH [illegible]	3/14/78
	WT-R-3895 "High" Setpoint	S.P. 1500 Set 1500 YES	N/A YES	JH [illegible]	3/14/78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.3.2	WDL-R-1311 Ratemeter Switch to "Oper"	Oper	"Oper" Position	JB Met-Ed	1/28/78
	Ratemeter "Fail/Reset" Indicator "ON"	ON	ON	JB Met-Ed	1/28/78
10.7.3.2.3.4	WDL-V257 will not open	Cl.	closed	JB Met Ed	1/28/78
10.7.3.2.3.7	WDL-V99 will not open	Closed	closed	JB Met-Ed	1/28/78
10.7.3.2.4.1	WDL-R-1311 Bypass Switch to "Normal"	Normal	"Normal"	JB Met Ed	1/28/78
10.7.3.2.4.8	WDL-R-1311 Ratemeter Alarms (Alert and High) are one	On ON	Alert - On High - On	JB Met Ed	1/28/78
10.7.3.2.4.9	Panel 12 "RMS Trouble" Alarm On	ON	On	JB Met-Ed	1/28/78
	Panel 8 - B-9 Alarm "Unit 2 Non-Rad Liquid Waste Discharge Valve Closed D-9		On		
10.7.3.2.4.11	WDL-V93A Closed	Closed	Closed	JB Met-Ed	1/28/78
	WDL-V93B Closed	Closed	Closed	JB Met-Ed	1/28/7
	WDL-V99 Closed	Closed	Closed	JB Met Ed	1/28/7

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.3.2. 4.11 (Cont'd)	WDL-V100 Closed	Closed	Closed	JHB Met-Ed	1/28/78
10.7.3.2. 4.12	WDL-P-11A Trip	OFF	Off	JHB Met-Ed	1/28/78
	WDL-P-11B Trip	OFF	Off	JHB Met-Ed	1/28/78
	WDL-P-8A Trip	OFF	Off	JHB Met-Ed	1/28/78
	WDL-P-8B Trip	OFF	Off	JHB Met-Ed	1/28/78
10.7.3.3. 1	WT-R-3894 Ratemeter Switch is in the "Oper" position	Oper	Oper.	JHB Met-Ed	3/15/78
10.7.3.3. 1.2	The WT-R-3894 Ratemwter "fail/reset" indicator is on	On	On	JHB Met-Ed	3/15/78
10.7.3.3. 1.3	WT-FHS-3894 is in Auto	Auto	Auto	JHB Met-Ed	3/15/78
10.7.3.3. 1.4	WT-V1Ø9 is Closed	Closed	Closed	JHB Met-Ed	3/15/78
	WT-V118 is open	Open	Open	JHB Met-Ed	3/15/78
10.7.3.3. 2.2	WT-R-3894 Ratemeter "alert" and "high" alarms - On	On	On	JHB Met-Ed	3/15/78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.3.3 2.3	Panel 12 Alarm "RMS Trouble" - On D-29	On	On	JB Met Ed	3/15/78
10.7.3.3 2.5	WT-V-119 - Open	Open	Open	JB Met Ed	3/15/78
	WT-V118 - Closed	Closed	Closed	JB Met Ed	3/15/78
10.7.3.4. 1	WT-R-3895 Ratemeter switches is in the "oper" position	Oper	Oper.	JB Met Ed	3/15/78
10.7.3.4. 1.2	The WT-R-3895 Ratemeter "fail/reset" indicator is On	On	On	JB Met Ed	3/15/78
10.7.3.4. 1.3	WT-FHS-3895 is in Auto	Auto	Auto	JB Met Ed	3/15/78
10.7.3.4. 1.4	WT-V121	Open	Open	JB Met Ed	3/15/78
	WT-V115	Closed	Closed	JB Met Ed	3/15/78
10.7.3.4. 2.2	WT-R-3895 Ratemeter "alert" and "high" alarms - On	On	On	JB Met Ed	3/15/78
10.7.3.4. 2.3	Panel 12 Alarm "RMS Trouble" - On D-29	On	On	JB Met Ed	3/15/78
10.7.3.4. 2.5	WT-V115 - Open	Open	Open	JB Met Ed	3/15/78

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Step No.	Description of Data Required	Data	Acceptance Criteria	Initials / Org.	Date
10.7.3.4 2.5 (Cont'd)	WT-V121 Closed	Closed	Closed	JHS/MetEd	3/15/78

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DATA SHEET 10.8

10.8.3 Normal flow indication on Panel 12 or local.

E-14 Green

	(White Light)	Date	Acc.Crit.	Init/Org.	Date
D-22	MU-R-720	3/15/78 OFF	On	JB Mitel	3/15/78
D-24	IC-R-1091	3/28/78 ON	On	JB Mitel	3/28/78
	IC-R-1092	3/29/78 ON 3/15/78 ON	On	JB Mitel	3/29/78
D-11	WDL-R-1311	2/2/78 ON	On	JB Mitel	2/2/78
	WT-R-3894	3/16/78 ON	On	JB Mitel	3/16/78
E-23	WT-R-3895	3/24/78 ON	On	JB Mitel	3/24/78
10.8.4	IC-R-1093	3/15/78 ON	On	JB Mitel	3/15/78
	DC-R-3399	3/15/78 ON	On	JB Mitel	3/15/78
	DC-R-3400	3/15/78 ON	On	JB Mitel	3/15/78
	NS-R-3401	3/15/78 OFF 5/20/78 ON	On	JB Mitel	5/20/78 3/15/78
	SF-R-3402	3/15/78 ON	On	JB Mitel	3/15/78

10.8.5 Fault Flow Indication on Panel 12 or local

E-14 Red

	~~(Amber~~ Light)				
	MU-R-720	3/15/78 ON	On	JB Mitel	3/15/78
D-24	IC-R-1091	3/28/78 ON	On	JB Mitel	3/28/78
	IC-R-1092	3/15/78 ON	On	JB Mitel	3/15/78
D-11	WDL-R-1311	2/2/78 ON	On	JB Mitel	2/2/78
	WT-R-3894	3/16/78 off	On	JB Mitel	3/16/78
E-23	WT-R-3895	3/24/78 off	On	JB Mitel	3/24/78

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DATA SHEET 10.8

10.8.6	Fault Flow Indication	Date	Acc.Crit.	Init/Org.	Date
	IC-R-1093	3/15/78 OK	On	[illegible]	3/15/78
	DC-R-3399	3/15/78 OK	On	[illegible]	3/15/78
	DC-R-3400	3/15/78 OK	On	[illegible]	3/15/78
D30	NS-R-3401	5/30/78 OK	On	[illegible]	5/30/78
	SF-R-3402	3/15/78 OK	On	[illegible]	3/15/78

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11.0 ACCEPTANCE CRITERIA

11.1 Acceptance Criteria are as listed on the Data Sheets in Section 10.0.

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TEST PROCEDURE EXCEPTION AND DEFICIENCY LIST Rev. 1

ENCLOSURE 1 OF TP 360/1B

COVER PAGE

The exception and deficiency consists of the following pages: 1, 2, 3, 4

No.	E/D	Par.	Description/Initial/Date	Justification/Resolution	Justified/ Completed Signoff	Date
1	E	2.1	Incorrect drawing revision numbers GHB 9/14/77	Corrected drawing revisions GHB	GHB	1/28/78
2	E	3	~~Sections will be signed off~~ GHB Can not be signed as result of incomplete turnover of system. GHB 9/14/77	Turnover of RMS Complete for WBL-R-1311	GHB	1/28/78
3	E	7.1	Radiation Monitors in system not operation shall be completed prior to 9.7.1.8 be started GHB 9/14/77	~~Audible alarm~~ GHB ~~Annunciator were verified operational for all conditions of alarm.~~ See D-9	GHB	9/16/78
4	E		Not Operable, not required to start test. GHB 9/23/77	Audible and Annunciator were verified operational for all correct trips.	GHB	1/26/78
5	E		Not Operable, not required to start test GHB 9/23/77	Defect switch verified operable 1/28/78, with the trip interlock likely were open	GHB	1/28/78
6	E	9.6.4.3.6	Point 3 specified, step can be used for calib. of 10 monitors GHB 1/7/78	Step used and the appropriate recorder point for monitor under test on HRVR-3269." GHB 1/7/78	GHB	1/7/78
7	E	9.6.4.3.6	Column for recorder cpm was left out as required by step. GHB 1/7/78	Added column to recorder cpm for step GHB 1/7/78	GHB	1/7/78
8	E	9.3.1.2	Record input incorrect. GHB 1/7/78	Recorder input 1V to allow alignment to calibrator	GHB	1/7/78
9	D	9.7.3.2.4.9	Alarm window did not actuate. GHB 1/28/78	Issue PR 5296 to correct operation of Panel window E-B-7 ~~GHB 3/10/78~~ to clean up	GHB	3/10/78

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SUBSEQUENT PAGES

No.	E/D	Par.	Description/Initial/Date	Justification/Resolution	Signoff	Justified/ Completed Date
10	E	9.6.3	Section not performed. JJB 1/28/78 SEE E-21	Detector linearity was performed at factory during factory testing. This was done in addition to factory calibration of instrument strings. Therefore this section does not affect string calibration. Data obtained from this calibration can be used to correlate linearity data if required in future. JJB 1/28/78	JJB	1/28/78
11	D	9.8.3 & 5	Not performed at this time due to low or no flow conditions. JJB 1/28/78	Perform when flow conditions permit. Pump operability has been verified with flow through drain flow switch indicating lights will be verified when pump can be run for longer duration without damaging pump. Retested Satisfactorily 2/2/78.	JJB	2/2/78
12	E	9.6	Source readings not taken JJB 1/30/78	Source readings are taken for baseline only, monitor can be declared operably without these readings. Readings to be taken prior to completion of TP. ~~[illegible]~~	~~JJB 1/30/78~~ JJB	~~2/24/78~~ 3/1/78
13	E	9.4 & 9.5.14	Remote ratemeter not verified in agreement at 10^6 JJB 1/30/78	Remote ratemeter verified agreement at 1.5×10^{-6} CPM, background, & CR meter. Instead of meter comparisons must verify at one point is sufficient to ensure both meters are receiving proper signal.	JJB	1/30/
14	E	9.8.3 & 9.8.5	Color code incorrect JJB 2/2/78	Correct colors for flow lights	JJB	2/2/78
15	E	10 of 9.8.4 & 10 of 9.8.6	Can not determine flow rate per design. Pump trip flow fault should energize. JJB 2/2/78	Run pump verify normal flow light, trip pump verify flow fault light.	JJB	2/2/
16	E	9.4.1	Ratemeter ~~[illegible]~~ is not 10 mv but 1V. JJB 2/10/78	~~[illegible]~~ Record voltage and correct data sheet for 1V.	JJB	2/10/78

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Page 2

SUBSEQUENT PAGES

No.	E/D	Par.	Description/Initial/Date	Justification/Resolution	Signoff	Justified/ Completed Date
17	E	10.5.7 thru 10.5.16 WT-R 3894 WT-R-3895	WT-R 3894 + 3895 only have local rotameter indication JFB 3/5/78	Fill in applicable local indication in place of Panel 12 indication. JFB	JFB	3/5/78
18	E	10.5.7 thru 10.5.1 WT-R-3894 WT-R-3895	No interface with Panel 12 Alarm use Panel 12 light indication JFB 3/5/78	Fill in applicable light indication from Panel 12.	JFB	3/5/78
19	E	10.5.10 WT-R-3895	TYPO should be OFF not OF. JFB 3/5/78	Correct data sheet	JFB	3/5/78
20	E	8.6	Did not flush with demineralized water JFB 3/21/78	Inspect and clean each nozzle prior to calibration	JFB	3/21
21	E	10.4	Did not take linearity data using limit source. JFB 3/12/78	No additional info to be established by using limit source since when doing a linearity you are not concerned with a specific value.	JFB	3/12
22	D	10.8.3	Red light went out green did not come on, light bulb ok. JFB 3/15/78	Submit work request 2765 to repair recorder and check at 0 and cal points. Work request completed 3/24/78	JFB JFB	3/24/78
23	E	10.8.3 10.8.5	No Panel 120 flow indicator JFB 3/15/78	Not applicable	JFB	3/15
24	D	10.8.3 10.8.5	IC-R-1091 motor seized. JFB 3/15/78	Submit work request 2762 to repair motor. Work Request completed 3/28/78	JFB	3/28/78
25	E D	9.8 ~~9.8~~	WT-R-3895 pump flange leaks could not perform JFB 3/16/78	Submitted work request 2763 to repair pump and check flow light. Completed 3/29/78	JFB	3/16/78
26	E	9.3	WT-R-3894 + 3895 chart recorder not operating properly JFB 3/16/78	Submitted work request 2764 to repair recorder. Completed 3/21/78 recorder functioned properly JFB 3/21/78	JFB	3/16

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Page 3

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SUBSEQUENT PAGES

No.	E/D	Par.	Description/Initial/Date	Justification/Resolution	Signoff	Justified/ Completed Date
27	E	9.3	WT-R-3894 & WT-R-3895 local recorders are not 1 & 4 inch speeds JHB 3/21/78	Check speed of recorders in accordance with vendors manual.	JHB	3/21/78
28	E	10.6.3 WT-R-3894 ~~WT-R-3895~~	Data not taken at time of calibration due to recorders not operating JHB 3/21/78	Upon recorder repair, alignment with rotameter was checked at 0, full scale and cycle upon to verify proper tracking.	JHB	3/21/78
29	D	10.7.39.[illegible]	Per design will not get RMS Trouble Alarm JHB 3/21/78	Should be red alarm light on Panel 12 -ON JHB	JHB	3/21/78
30	D	10.8.9.4.6 NS-R-3401	Flow switch does not change state as designed. JHB 3/21/78	Submitted work request to correct problem. (2899 WR#) Flow switch repaired and tested sat.	JHB	5/30/78

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T/P 360/1B

ENCLOSURE 2

ENCLOSURE 2

Table No.1

Sliding Link Terminal Block Cross Reference (+16 volt Panel 12)

Liquid Radiation Channel	Terminal Block Number	Terminal Number	Sliding Links Closed Init/Org.	Date
MU-R-720(Gross)	TB 149	3	[illegible]	3/15/78
MU-R-720(Iodine)	TB 150	3	[illegible]	3/15/78
IC-R-1091	TB 151	3	[illegible]	3/15/78
IC-R-1092	TB 152	3	[illegible]	3/15/78
IC-R-1093	TB 153	3	[illegible]	3/15/78
WDL-R-1311	TB 154	3	[illegible]	1/28/78
DC-R-3399	TB 155	3	[illegible]	3/15/78
DC-R-3400	TB 156	3	[illegible]	3/15/78
NS-R-3401	TB 157	3	[illegible]	3/15/78
SF-R-3402	TB 158	3	[illegible]	3/15/78

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TABLE NO. 2

UNIVERSAL DECAY TABLE

NOTE: . . The following table gives the fraction of activity of a nuclide remaining, from 0.001 half-life to 1.000 half-life.

To use this table:

1. Divide elapsed time by the half-life ($^{t}/_{T\frac{1}{2}}$). Time must be in the same units.
2. With the answer obtained in Step 1, enter appropriate row along the side and the column at the top. The number obtained is the fraction of original activity remaining.
3. Multiply the original activity by this figure to obtain the present activity (or the amount remaining).

NOTE: The half-life of ^{133}Ba is 126 months.

Decay ^{133}Ba to the nearest month only.

Example: If a ^{133}Ba source was cross calibrated on 4/72, what would the decay factor be on 9/74 (it has decay 29 months).

$$\frac{29}{126} = 126\overline{)29.000} = 0.230$$

```
          0.2301
126)29.000
    25.2
     3.80
     3.78
      .02
```

Checking the Universal Decay Table, one would multiply the original activity of the ^{133}Ba source on 4/72 by 0.85266 to obtain the activity value on 9/74.

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UNIVERSAL DECAY TABLE

ACTIVITY REMAINING FOR $t/T_{\frac{1}{2}}$ FROM .001 TO 1.00

	.000	.001	.002	.003	.004	.005	.006	.007	.008	.009
.000	.00000	.99968	.99862	.99793	.99723	.99645	.99586	.99516	.99446	.99379
.010	.99309	.99238	.99172	.99103	.99034	.98966	.98898	.98828	.98759	.98693
.020	.98623	.98554	.98487	.98419	.98350	.98243	.98214	.98146	.98076	.98010
.030	.97942	.97874	.97807	.97740	.97671	.97603	.97517	.97446	.97399	.97333
.040	.97262	.97195	.97132	.97065	.96997	.96930	.96820	.96795	.96726	.96662
.050	.96594	.96527	.96461	.96393	.96326	.96260	.96190	.96125	.96058	.95994
.060	.95928	.95862	.95795	.95728	.95661	.95596	.95529	.95462	.95395	.95331
.070	.95264	.95198	.95133	.95067	.95000	.94936	.94870	.94800	.94733	.94673
.080	.94607	.94522	.94467	.94392	.94326	.94261	.94193	.94130	.94063	.94000
.090	.93926	.93863	.93833	.93759	.93693	.93628	.93564	.93499	.93434	.93370
.100	.93304	.93240	.93175	.93112	.93046	.92982	.92906	.92853	.92787	.92725
.110	.92660	.92596	.92532	.92468	.92403	.92340	.92276	.92216	.92152	.92085
.120	.92020	.91956	.91893	.91785	.91766	.91702	.91639	.91575	.91511	.91448
.130	.91389	.91321	.91255	.91196	.91132	.91069	.91008	.90939	.90841	.90817
.140	.90747	.90691	.90629	.90566	.90502	.90440	.90378	.90314	.90250	.90190
.150	.90127	.90064	.90002	.89931	.89940	.89816	.89754	.89690	.89627	.89566
.160	.89504	.89442	.89381	.89319	.89257	.89195	.89133	.89071	.89008	.88949
.170	.88888	.88825	.88765	.88702	.88650	.88579	.88518	.88456	.88393	.88334
.180	.88272	.88211	.88150	.88098	.88030	.87967	.87905	.87885	.87852	.87724
.190	.87663	.87602	.87542	.87481	.87420	.87320	.87300	.87216	.87178	.87118
.200	.87057	.86997	.86937	.86877	.86816	.86756	.86697	.86636	.86576	.86517
.210	.86456	.86396	.86337	.86277	.86217	.86157	.86082	.86037	.85978	.85919
.220	.85859	.85800	.85741	.85681	.85621	.85579	.85503	.85443	.85384	.85326
.230	.85266	.85207	.85148	.85097	.85030	.84975	.84914	.84853	.84794	.84735
.240	.84677	.84619	.84561	.84502	.84443	.84384	.84326	.84268	.84210	.84152
.250	.84092	.84034	.83976	.83918	.83860	.83802	.83744	.83685	.83628	.83570
.260	.83511	.83454	.83396	.83339	.83283	.83223	.83208	.83166	.83050	.82993
.270	.82935	.82878	.82820	.82763	.82705	.82648	.82591	.82533	.82476	.82419
.280	.82362	.82313	.82248	.82191	.82136	.82077	.82021	.81962	.81907	.81850
.290	.81792	.81736	.81681	.81624	.81567	.81511	.81454	.81397	.81341	.81300
.300	.81228	.81172	.81116	.81060	.81004	.80948	.80892	.80819	.80779	.80702
.310	.80662	.80609	.80556	.80500	.80444	.80389	.80333	.80277	.80222	.80166
.320	.80110	.80055	.80000	.79944	.79888	.79834	.79779	.79721	.79666	.79613
.330	.79557	.79502	.79447	.79392	.79337	.79281	.79227	.79172	.79118	.79063
.340	.79007	.78953	.78899	.78844	.78789	.78735	.78681	.78625	.78571	.78517
.350	.78462	.78408	.78354	.78300	.78245	.78191	.78137	.78082	.78028	.77974
.360	.77920	.77866	.77811	.77759	.77704	.77648	.77597	.77543	.77489	.77436
.370	.77383	.77328	.77275	.77222	.77168	.77115	.77062	.77007	.76953	.76901
.380	.76848	.76795	.76742	.76689	.76633	.76582	.76529	.76476	.76423	.76370
.390	.76317	.76272	.76212	.76159	.76106	.76053	.76001	.75948	.75895	.75843
.400	.75790	.75737	.75685	.75633	.75580	.75528	.75476	.75423	.75371	.75319
.410	.75266	.75215	.75163	.75111	.75058	.75006	.74955	.74902	.74856	.74799
.420	.74747	.74695	.74644	.74592	.74540	.74488	.74437	.74385	.74334	.74282
.430	.74231	.74179	.74128	.74077	.74025	.73974	.73923	.73871	.73820	.73762
.440	.73716	.73667	.73616	.73568	.73514	.73463	.73413	.73361	.73311	.73260
.450	.73209	.73158	.73108	.73057	.73006	.72956	.72958	.72854	.72804	.72754
.460	.72703	.72653	.72603	.72545	.72527	.72452	.72402	.72351	.72302	.72252
.470	.72201	.72151	.72102	.72052	.72001	.71952	.71902	.71852	.71802	.71753
.480	.71702	.71653	.71604	.71554	.71504	.71455	.71405	.71355	.71306	.71257
.490	.71207	.71158	.71109	.71060	.71010	.70961	.70912	.70863	.70814	.70765
.500	.70715	.70666	.70618	.70569	.70520	.70471	.70423	.70373	.70325	.70276

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TMI UNIT II
TP 360/1B 204 265
Enclosure 2
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UNIVERSAL DECAY TABLE

ACTIVITY REMAINING FOR $t/T_{\frac{1}{2}}$ FROM .001 TO 1.00

	.000	.001	.002	.003	.004	.005	.006	.007	.008	.009
.510	.70227	.70179	.70130	.70082	.70033	.69984	.69936	.69887	.69839	.69791
.520	.69742	.69694	.69646	.69598	.69549	.69501	.69453	.69404	.69356	.69309
.530	.69261	.69213	.69165	.69117	.69069	.69021	.68973	.68925	.68877	.68830
.540	.68796	.68735	.68687	.68640	.68593	.68545	.68497	.68450	.68395	.68348
.550	.68307	.68260	.68213	.68166	.68118	.68071	.68024	.67976	.67913	.67882
.560	.68835	.67782	.67742	.67695	.67646	.67601	.67554	.67507	.67461	.67414
.570	.67367	.67320	.67274	.67227	.67181	.67134	.67088	.67041	.66995	.66948
.580	.66902	.66856	.66810	.66764	.66718	.66671	.66624	.66578	.66532	.66486
.590	.66440	.66394	.66348	.66302	.66256	.66210	.66164	.66118	.66053	.66027
.600	.65981	.65935	.65890	.65846	.65799	.65753	.65707	.65661	.65616	.65571
.610	.65525	.65480	.65435	.65390	.65344	.65299	.65244	.65208	.65163	.65118
.620	.65073	.65028	.64983	.64938	.64897	.64843	.64803	.64758	.64713	.64669
.630	.64623	.64578	.64534	.64489	.64440	.64400	.64356	.64310	.64273	.64222
.640	.64178	.64133	.64089	.64044	.64000	.63955	.63911	.63866	.63822	.63778
.650	.63734	.63690	.63646	.63602	.63556	.63514	.63470	.63425	.63382	.63338
.660	.63293	.63250	.63206	.63163	.63118	.63075	.63032	.62987	.62944	.62900
.670	.62856	.62813	.62770	.62727	.62683	.62639	.62588	.62552	.62509	.62466
.680	.62422	.62379	.62336	.62293	.62250	.62207	.62164	.62120	.62077	.62035
.690	.61991	.61936	.61906	.61863	.61820	.61777	.61736	.61691	.61649	.61606
.700	.61563	.61520	.61478	.61436	.61393	.61350	.61308	.61265	.61223	.61181
.710	.61138	.61096	.61054	.61012	.60969	.60927	.60885	.60842	.60800	.60758
.720	.60716	.60674	.60632	.60572	.60548	.60506	.60464	.60422	.60380	.60339
.730	.60296	.60255	.60213	.60172	.60130	.60088	.60047	.60005	.59963	.59922
.740	.59880	.59838	.59797	.59756	.59717	.59673	.59632	.59590	.59549	.59508
.750	.59466	.59426	.59385	.59344	.59302	.59261	.59220	.59179	.59144	.59097
.760	.59058	.59015	.58974	.58934	.58892	.58852	.58811	.58770	.58730	.58690
.770	.58648	.58608	.58567	.58527	.58485	.58477	.58405	.58364	.58324	.58271
.780	.58243	.58202	.58163	.58122	.58082	.58042	.58002	.57961	.57921	.57910
.790	.57841	.57801	.57761	.57721	.57681	.57641	.57601	.57561	.57579	.57438
.800	.57441	.57402	.57362	.57317	.57282	.57243	.57204	.57163	.57124	.57085
.810	.57045	.57005	.56966	.56904	.56836	.56847	.56808	.56768	.56729	.56690
.820	.56645	.56611	.56572	.56533	.56494	.56455	.56416	.56377	.56338	.56299
.830	.56359	.56320	.56282	.56243	.56203	.56165	.56126	.56087	.56049	.56010
.840	.55599	.55832	.55794	.55755	.55716	.55678	.55640	.55601	.55562	.55524
.850	.55485	.55447	.55408	.55370	.55328	.55293	.55255	.55217	.55179	.55140
.860	.55102	.55064	.55026	.54988	.54950	.54912	.54874	.54841	.54797	.54760
.870	.54721	.54683	.54646	.54605	.54565	.54532	.54495	.54457	.54419	.54382
.880	.54344	.54306	.54269	.54231	.54193	.54156	.54118	.54081	.54043	.54006
.890	.53968	.53931	.53894	.53856	.53819	.53782	.53745	.53702	.53670	.53633
.900	.53595	.53558	.53528	.53485	.53447	.53410	.53373	.53336	.53299	.53262
.910	.53225	.53188	.53152	.53115	.53078	.53043	.53005	.52968	.52931	.52895
.920	.52858	.52821	.52785	.52748	.52711	.52675	.52638	.52600	.52566	.52529
.930	.52493	.52456	.52420	.52384	.52347	.52311	.52275	.52239	.52203	.52168
.940	.52130	.52094	.52058	.52022	.51986	.51950	.51916	.51893	.51842	.51806
.950	.51770	.51734	.51698	.51641	.51627	.51591	.51556	.51520	.51484	.51448
.960	.51402	.51377	.51342	.51306	.51270	.51235	.51200	.51164	.51129	.51093
.970	.51057	.51027	.50997	.50962	.50918	.50881	.50846	.50810	.50775	.50740
.980	.50715	.50670	.50635	.50600	.50570	.50530	.50495	.50460	.50426	.50390
.990	.50355	.50320	.50285	.50256	.50216	.50181	.50141	.50111	.50077	.50042
1.000	.50000	.49973	.49938	.49904	.49869	.49838	.49800	.49765	.49731	.49697

ENCLOSURE 2

TABLE NO.3

Sliding Link Terminal Block Cross Reference (Signal Input) (Panel 12)

Liquid Radiation Channel	Terminal Block Number	Terminal Number	Sliding Links Closed Init/Org.	Date
MU-R-720	TB 149	1 & 2		
IC-R-1091	TB 151	1 & 2		
IC-R-1092	TB 152	1 & 2		
IC-R-1093	TB 153	1 & 2	[illegible]	1/30/81
WDL-R-1311	TB 154	1 & 2	[illegible]	1/30/81
DC-R-3399	TB 155	1 & 2	[illegible]	1/30/81
DC-R-3400	TB 156	1 & 2		
NS-R-3401	TB 157	1 & 2		
SF-R-3402	TB 158	1 & 2		

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FIGURE 1

RATEMETER-FRONT PANEL

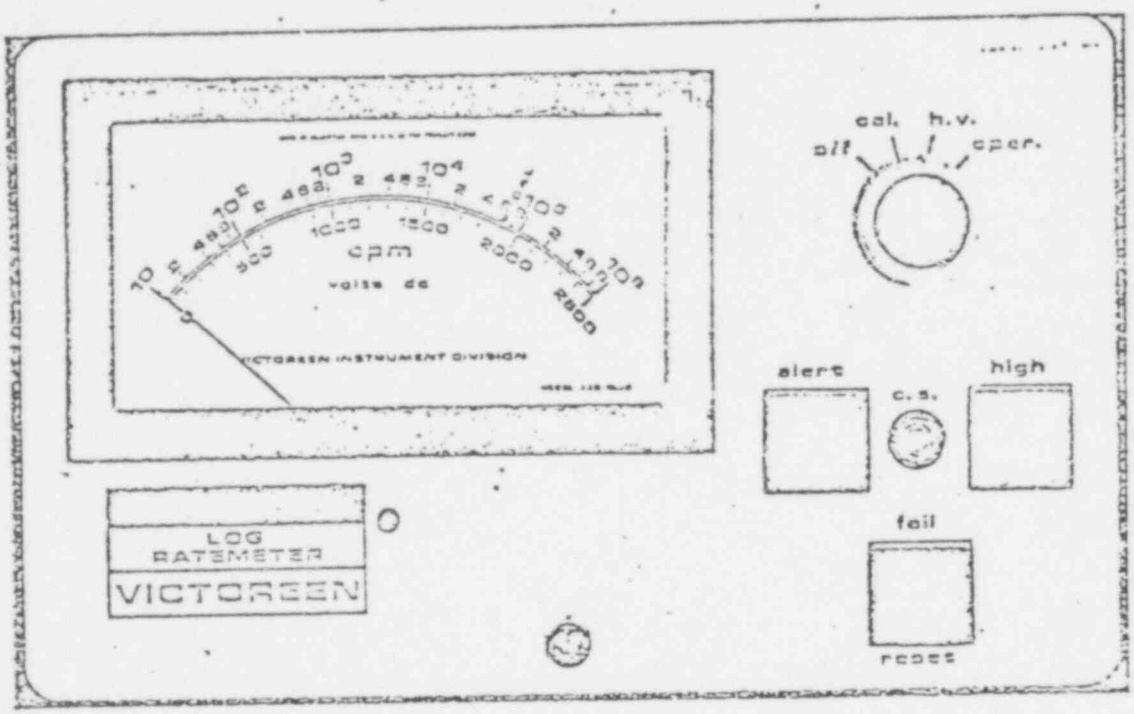

Figure 1: Log Ratemeter, Front View

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FIGURE 2

RATEMETER COMPONENT LOCATIONS

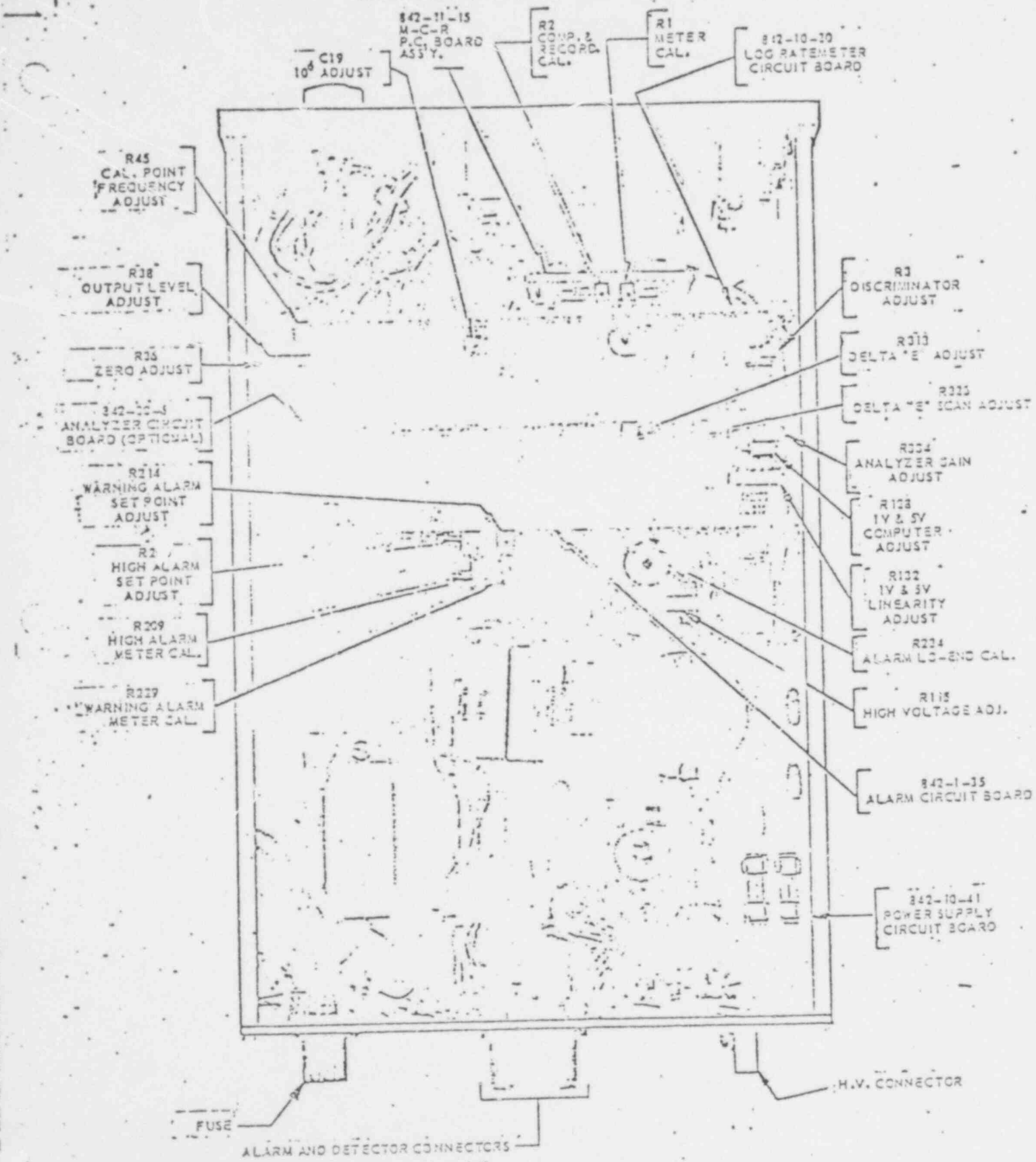

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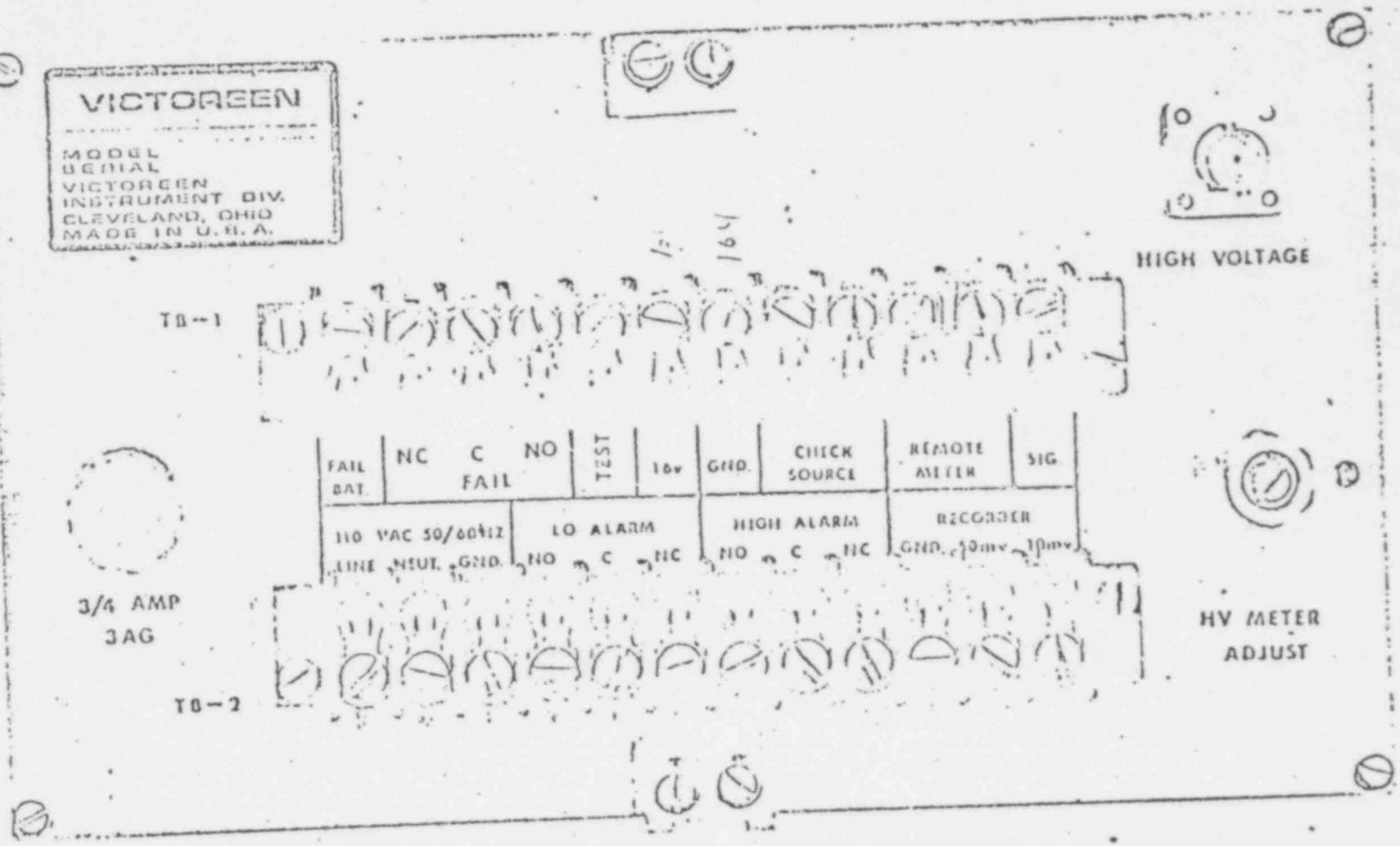
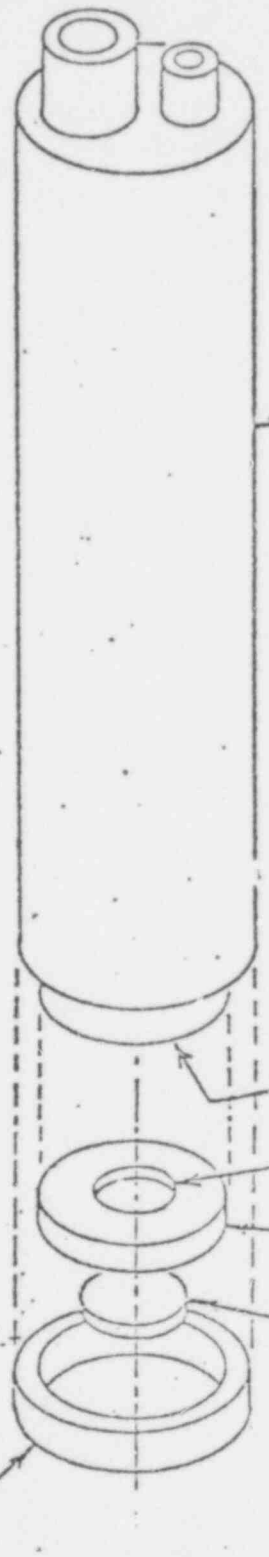
FIGURE 3

RATEMETER-REAR PANEL



Mu-R-720 Calibration Source Holder for ^{60}Co G-1002



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(Note: No sponge rubber is needed, since there is a tight friction fit between the Calibration Source and Calibration Source Retainer).

FIGURE 4

CALIBRATION SOURCE HOLDER FOR ^{60}CO SOURCE

Gamma Calibration Source Holder

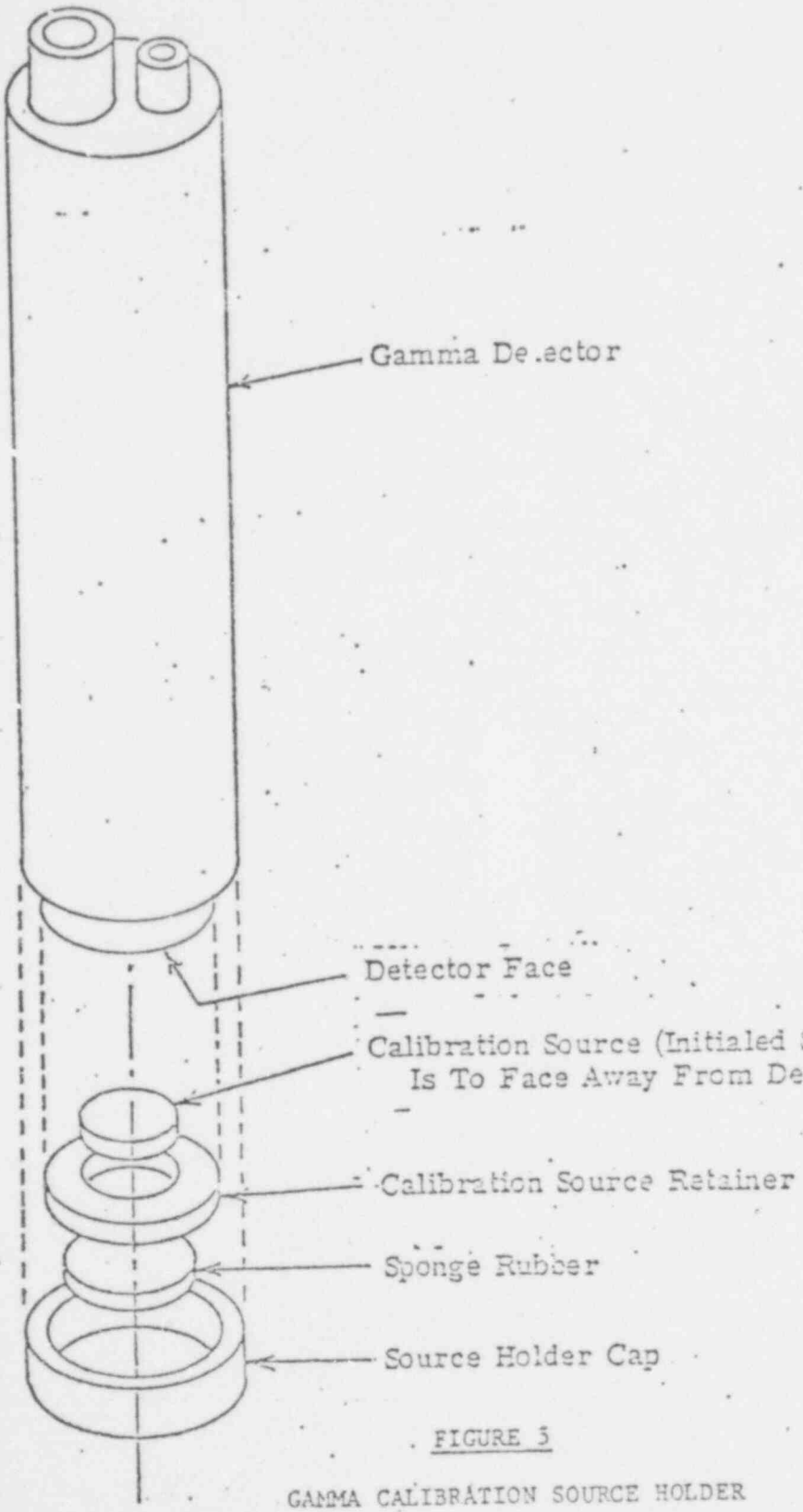

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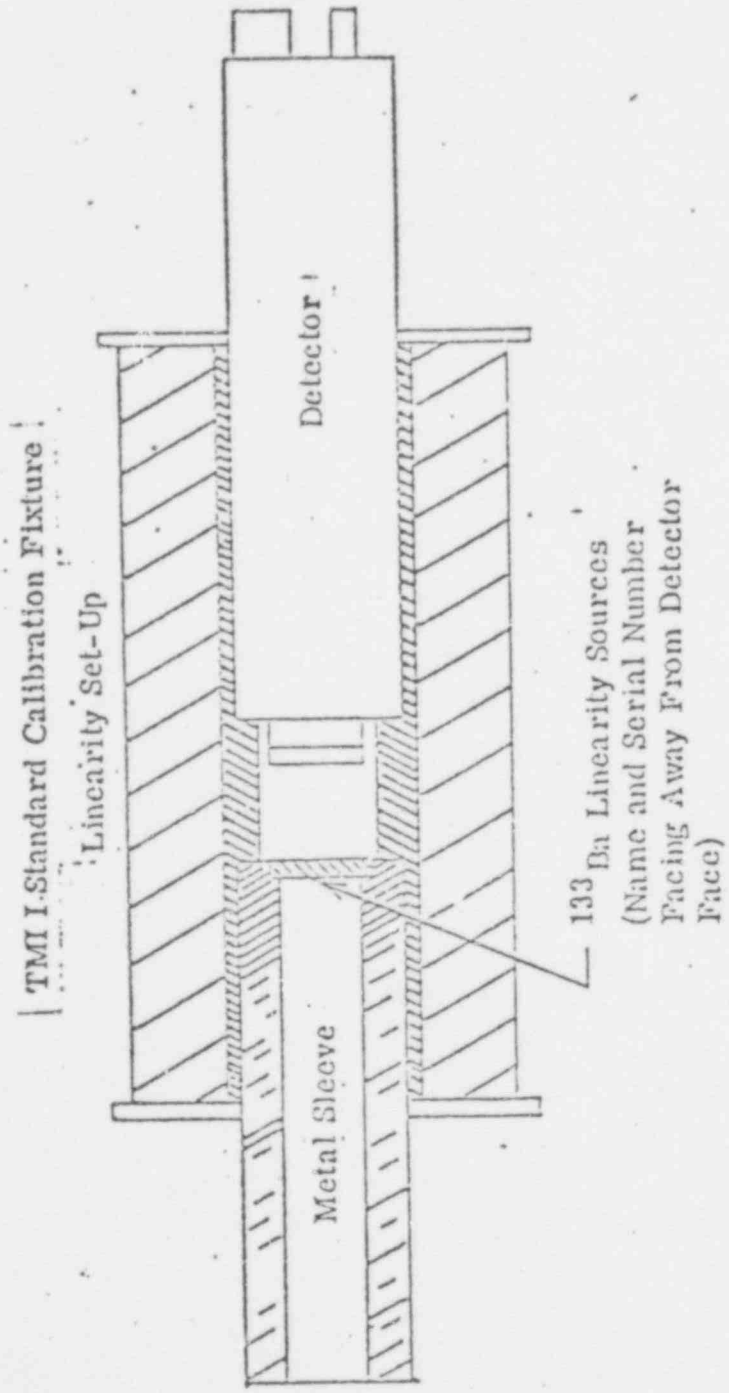
FIGURE 3

GAMMA CALIBRATION SOURCE HOLDER

FIGURE 6

LINEARITY SET-UP



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