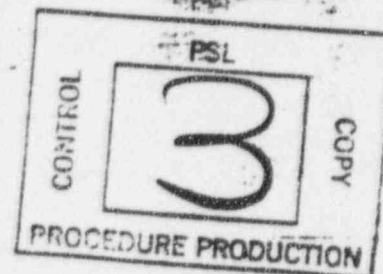


FLORIDA POWER & LIGHT COMPANY  
ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057  
REVISION 2



1.0 TITLE:

FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLIES

2.0 REVIEW AND APPROVAL:

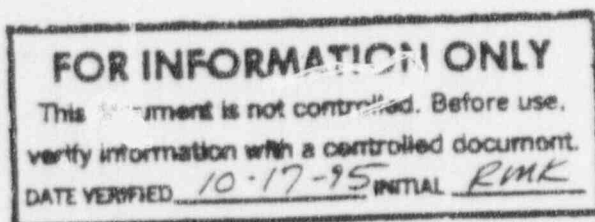
Reviewed by Facility Review Group \_\_\_\_\_ 3/23 1993  
Approved by G. J. Boissy \_\_\_\_\_ Plant General Manager 3/26 1993  
Revision 2 Reviewed by FRG \_\_\_\_\_ 8/31 1995  
Approved by J. Scarola \_\_\_\_\_ Plant General Manager 8/31 1995

3.0 PURPOSE:

- 3.1 The purpose of this procedure is to provide the necessary instructions for the periodic testing and verification of all required voltages in an RM-80 subassembly and to calibrate the power fail circuitry in an RM-80 subassembly.
- 3.2 This procedure also provides the necessary instructions to perform periodic testing and maintenance of battery and charging circuitry in an RM-80 subassembly.
- 3.3 This procedure also covers periodic inspection of cables in the RM-80 subassemblies, CIJBs, RM-23s and PC11s.

4.0 PRECAUTIONS AND LIMITS:

- 4.1 This series of tests requires the RM-80 subassembly be down-powered.



|         |           |
|---------|-----------|
| S 2 OPS |           |
| DATE    | _____     |
| DOCT    | PROCEDURE |
| DOCN    | 2-1220057 |
| SYS     | _____     |
| COMP    | COMPLETED |
| ITM     | 2         |

Component: Sys: 26 Train:  
Associate: Assign Priority: B3  
Name: FYP-8085 CONT HI RANGE MONITORS Work Type: 6  
TECH SPEC 4.3.3.1  
Location: RCB/VARIOUS (SEE MCL) LMD: 2  
Defect/Request: 022FYP8085 CNTMNT HIGH RANGE

ATTACHMENT A

Fac: PLL Unit: 02  
MASTER  
WORK ORDER TASK  
95020580 01  
ER/PWO: 64 / 8085  
Chg Loc:  
Page: 4

Note (s) :

LMD

Note (s) :

LMD

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

4.0 PRECAUTIONS AND LIMITS: (continued)

- 4.2 Prior to performing this procedure, read it completely and become familiar with the requirements. Do not attempt to perform this procedure unless you understand it completely.
- 4.3 The functional testing of the Spent Fuel Pool Monitors should not be performed if fuel is being handled.
- 4.4 Do not perform this procedure with more than one (1) CIS Channel in Trip.

5.0 RELATED SYSTEM STATUS:

- 5.1 The RM-80 to be tested is in normal operating mode.
- 5.2 The Containment Radiation portion of the Engineering Safeguards Features Actuation System (ESFAS) is in the normal operating mode with no CIS channels in TRIP.

6.0 REFERENCES:

- 6.1 Liquid Process Radiation Monitors T/M 2998-14171
- 6.2 Airborne Radiation Monitors T/M 2998-14172
- 6.3 Area Monitor T/M 2998-14173
- 6.4 Safety Cabinets T/M 2998-14174
- 6.5 RM-23 Readout T/M 2998-14177
- 6.6 Model RM-80 Microprocessor T/M 2998-14179
- 6.7 Steam Line Monitoring System T/M 2998-15597
- 6.8 Wide Range Gas Monitors T/M 2998-15598
- 6.9 High Range Monitor T/M 2998-15891

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

7.0 RECORDS REQUIRED:

- 7.1 When completed, this procedure shall be maintained in the plant files in accordance with QI 17-PR/PSL-1, "Quality Assurance Records."

8.0 MATERIALS AND EQUIPMENT REQUIRED:

- 8.1 RM-23P or equivalent.
- 8.2 DMM, Model 197 or equivalent.
- 8.3 Variable transformer, 0 to 140 volts AC.
- 8.4 Contact cleaning tool. /R2
- 8.5 Contact Renu and/or Isopropyl alcohol. /R2



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE:

## 9.1 General Instructions

1. Inform the Control Room prior to placing the RM-80 in the bypass position and upon completion of test.
2. If a Spent Fuel Pool channel is Out-of-Service, a temporary jumper must be installed in the appropriate logic box; terminals TB1-10 & TB1-11 in the respective SA or SB logic box.

SA Logic Box Performed N/A I.V. N/A

SB Logic Box Performed N/A I.V. N/A

## 9.2 Power Supply Test

1. Turn the AC power switch (A-9) to the OFF position. /R2

2. Remove all plug-in circuit boards from the RM-80.

Performed R. Kuykendall I.V. J. L. Smith

3. Disconnect the 24 volts input connector to the high voltage power supply (PS-1).

Performed R. Kuykendall I.V. J. L. Smith

4. Turn the AC power switch (A-9) ON.

5. Connect the negative lead of DVM to TB2-11 on the low-voltage supply and record the voltages on Data Sheet A.

6. Measure the voltage between TB9-5 (+) and TB9-8 (-) and record on Data Sheet A.

7. Measure the voltage at the input connector to the high voltage power supply and record on Data Sheet A.

8. Disconnect the battery, measure the voltage across it and record on Data Sheet A.

Performed R. Kuykendall I.V. J. L. Smith

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

## 9.2 (continued)

9. After taking measurement, reconnect the battery.

Performed R. KuykendallI.V. J. L. Smith

10. A. (Area Monitor): Measure the voltage between TB7-2, TB7-3, TB7-11 and plant ground stud (E1) and record on Data Sheet A.
- B. (Process Monitor): Measure the voltage between TB7-11 and plant ground stud (E1) and record on Data Sheet A.

11. Turn the AC power switch (A9) to the OFF position.

/R2

12. Reconnect the 24 volts input connector to the high voltage power supply.

Performed R. KuykendallI.V. J. L. SmithNOTE

Step 9.2.13 shall be performed during normal calibration cycles and is optional during routine maintenance.

/R2

13. Inspect and clean printed circuit board contacts using a contact cleaning tool and contact cleaning solution.

/R2

14. Reinstall all circuit boards in the RM-80.

/R2

Performed R. KuykendallI.V. J. L. Smith

## 9.3 Battery Charger Adjustments

1. Connect the DVM negative test lead to COM. TP3 on the power Isolation board (A2).
2. Disconnect the wire connected to the positive side of the battery pack and connect it to the positive lead of the DVM.

Performed R. KuykendallI.V. J. L. Smith

3. Turn the AC power switch (A9) ON.

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

## 9.3- (continued)

4. On the power Isolation Board (A2), adjust R6 for a reading of 4.7 volts dc.
5. Turn the AC power switch (A9) OFF and remove DVM.
6. Reconnect the wire to the positive side of battery pack.

Performed R. HighlandI.V. J. HuntNOTE

POWER FAIL TRIP adjustments on the power/isolation board, can be made on the bench setup.

## 9.4 Power Fail Trip Adjustments

1. On the Power/Isolation board, turn the high trip potentiometer (R49) and the low trip potentiometer (R61) to the fully clockwise position. /R2
2. Connect the variable transformer to the test setup or if the test setup is not available, install the output of the variable transformer to TB1-1 (+) and TB1-3 (-) of the 24 vdc power supply.

Performed J. HuntI.V. R. HighlandNOTE

The GO and NO-GO LEDs on the mother board should be on.

3. Adjust (R49) until the NO-GO LED extinguishes and the GO LED flashes.
4. Set variable transformer for an output voltage of 100 volts AC.
5. Adjust (R61) until the GO and NO-GO LEDs are on continuously.
6. Set the variable transformer for an output voltage of 105 volts AC and adjust (R49) until the NO-GO LED goes off and the GO LED flashes.
7. Repeat steps 4 through 7 until the high and low trip LEDs are set at 105 volts AC and 100 volts AC respectively.

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

## 9.4 (continued)

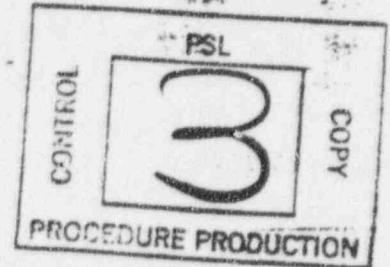
8. Turn the AC power switch (A-9) OFF, remove the variable transformer and reconnect the AC to TB1-1.

Signature N/A Benah TESTED Date 10/17/95

I.V. N/A Date    /   /   

9. Turn the AC power switch (A-9) ON, return system to service.

FLORIDA POWER & LIGHT COMPANY  
ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057  
REVISION 2



1.0 TITLE:

FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLIES

2.0 REVIEW AND APPROVAL:

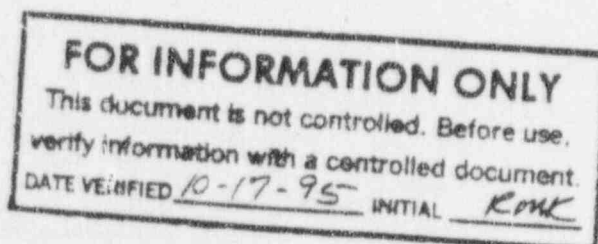
Reviewed by Facility Review Group 3/23 1993  
Approved by G. J. Boissy Plant General Manager 3/26 1993  
Revision 2 Reviewed by FRG 8/31 1995  
Approved by J. Scarola Plant General Manager 8/31 1995

3.0 PURPOSE:

- 3.1 The purpose of this procedure is to provide the necessary instructions for the periodic testing and verification of all required voltages in an RM-80 subassembly and to calibrate the power fail circuitry in an RM-80 subassembly.
- 3.2 This procedure also provides the necessary instructions to perform periodic testing and maintenance of battery and charging circuitry in an RM-80 subassembly.
- 3.3 This procedure also covers periodic inspection of cables in the RM-80 subassemblies, CIJBs, RM-23s and PC11s.

4.0 PRECAUTIONS AND LIMITS:

- 4.1 This series of tests requires the RM-80 subassembly be down-powered.



|         |           |
|---------|-----------|
| S 2 OPS |           |
| DATE    |           |
| DOCT    | PROCEDURE |
| DOCN    | 2-1220057 |
| SYS     |           |
| COMP    | COMPLETED |
| ITM     | 2         |



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

DATA SHEET A

TAG NO. RM-26 40

DATE 10/17/95

| SECTION          | REQUIRED VALUES  |                    | ACTUAL VALUES |
|------------------|--|--------------------|---------------|
| 9.2.5            | TB9-1 (+5 VDC)   | +4.75 V to +5.25 V | 5.20 VDC      |
| 9.2.5            | TB9-3 (+24 VDC)  | +22 V to +26 V     | 23.27 VDC     |
| 9.2.5            | TB9-6 (+5 VDC)   | +4.75 V to +5.25 V | 5.20 VDC      |
| 9.2.5            | TB9-7 (+10 VDC)  | +8 V to +12 V      | 12.00 VDC     |
| 9.2.5            | TB10-3 (-10 VDC)   | -12 V to -8 V      | -11.69 VDC    |
| 9.2.5            | TB10-6 (-5 VDC)  | -5.25 V to -4.75 V | -5.14 VDC     |
| 9.2.5            | TB10-8 (+5 VDC)  | +4.75 V to +5.25 V | 5.20 VDC      |
| 9.2.5            | TB10-11 (+10 VDC)  | +8 V to +12 V      | 12.00 VDC     |
| 9.2.5            | TB10-4 (+7 VDC)  | +6 V to +8 V       | 7.80 VDC      |
| 9.2.5            | TB10-2 (+8 VAC)  | +7 V to +9 V       | 9.75 VAC      |
| 9.2.6            | TB9-5(+) (+22 VDC)<br>TB9-8(-)                                     | +20 V to +24 V     | 24.00 VDC     |
| 9.2.7            | +24 VDC  | +22 V to +26 V     | 23.27 VDC     |
| 9.2.8            | BATTERY CONNECTIONS<br>(+) (-) $\geq 3$ VOLTS                      |                    | 4.12 VDC      |
| 9.2.9A<br>9.2.9B | TB7-2, TB7-3, TB7-11 (AREA) (120 VAC)<br>T7-11 (PROCESS) (120 VAC) |                    | 120.20 VAC    |

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

4.0 PRECAUTIONS AND LIMITS: (continued)

- 4.2 Prior to performing this procedure, read it completely and become familiar with the requirements. Do not attempt to perform this procedure unless you understand it completely.
- 4.3 The functional testing of the Spent Fuel Pool Monitors should not be performed if fuel is being handled.
- 4.4 Do not perform this procedure with more than one (1) CIS Channel in Trip.

5.0 RELATED SYSTEM STATUS:

- 5.1 The RM-80 to be tested is in normal operating mode.
- 5.2 The Containment Radiation portion of the Engineering Safeguards Features Actuation System (ESFAS) is in the normal operating mode with no CIS channels in TRIP.

6.0 REFERENCES:

- 6.1 Liquid Process Radiation Monitors T/M 2998-14171
- 6.2 Airborne Radiation Monitors T/M 2998-14172
- 6.3 Area Monitor T/M 2998-14173
- 6.4 Safety Cabinets T/M 2998-14174
- 6.5 RM-23 Readout T/M 2998-14177
- 6.6 Model RM-80 Microprocessor T/M 2998-14179
- 6.7 Steam Line Monitoring System T/M 2998-15597
- 6.8 Wide Range Gas Monitors T/M 2998-15598
- 6.9 High Range Monitor T/M 2998-15891



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

7.0 RECORDS REQUIRED:

- 7.1 When completed, this procedure shall be maintained in the plant files in accordance with QI 17-PR/PSL-1, "Quality Assurance Records."

8.0 MATERIALS AND EQUIPMENT REQUIRED:

- 8.1 RM-23P or equivalent.
- 8.2 DMM, Model 197 or equivalent.
- 8.3 Variable transformer, 0 to 140 volts AC.
- 8.4 Contact cleaning tool.
- 8.5 Contact Renu and/or Isopropyl alcohol.

/R2

/R2

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE:

## 9.1 General Instructions

1. Inform the Control Room prior to placing the RM-80 in the bypass position and upon completion of test.
2. If a Spent Fuel Pool channel is Out-of-Service, a temporary jumper must be installed in the appropriate logic box; terminals TB1-10 & TB1-11 in the respective SA or SB logic box.

SA Logic Box Performed N/A I.V. N/A

SB Logic Box Performed N/A I.V. N/A

## 9.2 Power Supply Test

1. Turn the AC power switch (A-9) to the OFF position. /R2

2. Remove all plug-in circuit boards from the RM-80.

Performed R. Keckinball I.V. J. L. Smith

3. Disconnect the 24 volts input connector to the high voltage power supply (PS-1).

Performed R. Keckinball I.V. J. L. Smith

4. Turn the AC power switch (A-9) ON.

5. Connect the negative lead of DVM to TB2-11 on the low-voltage supply and record the voltages on Data Sheet A.

6. Measure the voltage between TB9-5 (+) and TB9-8 (-) and record on Data Sheet A.

7. Measure the voltage at the input connector to the high voltage power supply and record on Data Sheet A.

8. Disconnect the battery, measure the voltage across it and record on Data Sheet A.

Performed R. Keckinball I.V. J. L. Smith

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

## 9.2 (continued)

9. After taking measurement, reconnect the battery.

Performed R. Kirkendall I.V. J. Smith

10. A. (Area Monitor): Measure the voltage between TB7-2, TB7-3, TB7-11 and plant ground stud (E1) and record on Data Sheet A.

- B. (Process Monitor): Measure the voltage between TB7-11 and plant ground stud (E1) and record on Data Sheet A.

11. Turn the AC power switch (A9) to the OFF position.

/R2

12. Reconnect the 24 volts input connector to the high voltage power supply.

Performed R. Kirkendall I.V. J. Smith**NOTE**

Step 9.2.13 shall be performed during normal calibration cycles and is optional during routine maintenance.

/R2

13. Inspect and clean printed circuit board contacts using a contact cleaning tool and contact cleaning solution.

/R2

14. Reinstall all circuit boards in the RM-80.

/R2

Performed R. Kirkendall I.V. J. Smith

## 9.3 Battery Charger Adjustments

1. Connect the DVM negative test lead to COM. TP3 on the power isolation board (A2).

2. Disconnect the wire connected to the positive side of the battery pack and connect it to the positive lead of the DVM.

Performed R. Kirkendall I.V. J. Smith

3. Turn the AC power switch (A9) ON.

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

9.3 (continued)

4. On the power Isolation Board (A2), adjust R6 for a reading of 4.7 volts dc.
5. Turn the AC power switch (A9) OFF and remove DVM.
6. Reconnect the wire to the positive side of battery pack.

Performed R. Kuykendall

I.V. J. L. L. L.

NOTE

POWER FAIL TRIP adjustments on the power/isolation board, can be made on the bench setup.

9.4 Power Fail Trip Adjustments

1. On the Power/Isolation board, turn the high trip potentiometer (R49) and the low trip potentiometer (R61) to the fully clockwise position. /R2
2. Connect the variable transformer to the test setup or if the test setup is not available, install the output of the variable transformer to TB1-1 (+) and TB1-3 (-) of the 24 vdc power supply.

Performed J. L. L. L.

I.V. R. Kuykendall

NOTE

The GO and NO-GO LEDs on the mother board should be on.

3. Adjust (R49) until the NO-GO LED extinguishes and the GO LED flashes.
4. Set variable transformer for an output voltage of 100 volts AC.
5. Adjust (R61) until the GO and NO-GO LEDs are on continuously.
6. Set the variable transformer for an output voltage of 105 volts AC and adjust (R49) until the NO-GO LED goes off and the GO LED flashes.
7. Repeat steps 4 through 7 until the high and low trip LEDs are set at 105 volts AC and 100 volts AC respectively.

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

9.0 DETAILED PROCEDURE: (continued)

## 9.4 (continued)

8. Turn the AC power switch (A-9) OFF, remove the variable transformer \_\_\_\_\_  
and reconnect the AC to TB1-1.

Signature N/A Bench setup used Date 11/7/95

I.V. N/A Date 1/1/

9. Turn the AC power switch (A-9) ON, return system to service.



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1220057, REVISION 2  
FUNCTIONAL TESTING OF THE RM-80 POWER SUPPLY ASSEMBLY

DATA SHEET A

TAG NO. RM-26-41

DATE 11 / 7 / 95

| SECTION | REQUIRED VALUES                               |                    | ACTUAL VALUES |
|---------|---|--------------------|---------------|
| 9.2.5   | TB9-1 (+5 VDC)                                | +4.75 V to +5.25 V | 5.19 VDC      |
| 9.2.5   | TB9-3 (+24 VDC)                               | +22 V to +26 V     | 23.61 VDC     |
| 9.2.5   | TB9-6 (+5 VDC)                                | +4.75 V to +5.25 V | 5.14 VDC      |
| 9.2.5   | TB9-7 (+10 VDC)                               | +8 V to +12 V      | 11.48 VDC     |
| 9.2.5   | TB10-3 (-10 VDC)                              | -12 V to -8 V      | -11.22 VDC    |
| 9.2.5   | TB10-6 (-5 VDC)                               | -5.25 V to -4.75 V | -5.14 VDC     |
| 9.2.5   | TB10-8 (+5 VDC)                               | +4.75 V to +5.25 V | 5.19 VDC      |
| 9.2.5   | TB10-11 (+10 VDC)                             | +8 V to +12 V      | 11.48 VDC     |
| 9.2.5   | TB10-4 (+7 VDC)                               | +6 V to +8 V       | 7.64 VDC      |
| 9.2.5   | TB10-2 (+8 VAC)                               | +7 V to +9 V       | 8.45 VAC      |
| 9.2.6   | TB9-5(+) (+22 VDC)                            | +20 V to +24 V     | 23.44 VDC     |
|         | TB9-8(-)                                      |                    |               |
| 9.2.7   | +24 VDC                                       | +22 V to +26 V     | 23.61 VDC     |
| 9.2.8   | BATTERY CONNECTIONS<br>(+) (-) $\geq 3$ VOLTS |                    | 4.11 VDC      |
| 9.2.9A  | TB7-2, TB7-3, TB7-11 (AREA) (120 VAC)         |                    | 124.67 VAC    |
| 9.2.9B  | T7-11 (PROCESS) (120 VAC)                     |                    |               |

Facility = PSL REC Warehouse = 1 Pick Cntl: 00075.9  
 Issue Ticket= 4341270 ROS: 50019509 Issue Type = Ref. N=  
 Work Order = 95020580 Task : 01 Deliver to :  
 Issued to ID= RMKOPSO EndROS: Y Issued By = CROOQUO Date= 10/17/95 I  
 W/O: 8085 FR: 64 GL Pt Acc : 300 . 000 Loc: 910 EAC: Return to Vendo :  
 =====

| * Stock Code | UTC Number | Item                        | Qty | UI | Location       | QType | Alloc | Or Hand |
|--------------|------------|-----------------------------|-----|----|----------------|-------|-------|---------|
| 0085128 1    | 0000369383 | S                           | 2   | EA | 1 K 27 051 000 | PR    | 2     | 7       |
| UTC Expired: | 99/99/99   | BATTERY, PACK, RECHARGEABLE |     |    |                |       | Rec:  |         |
| UTC Expired: |            |                             |     |    |                |       | Rec:  |         |
| UTC Expired: |            |                             |     |    |                |       | Rec:  |         |
| UTC Expired: |            |                             |     |    |                |       | Rec:  |         |
| UTC Expired: |            |                             |     |    |                |       | Rec:  |         |
| UTC Expired: |            |                             |     |    |                |       | Rec:  |         |
| More:        |            |                             |     |    |                |       |       |         |

F1=Help F4=Prompt F5=Search F7=Bkwd F8=Fwd F10=Perform Msg F12=Cancel

:ISSUE HAS BEEN COMPLETED.



**FIGURE 4**  
**TEMPORARY CHANGE REQUEST**  
(Page 1 of 3)

**A Reference Information: (Originator to complete)**

St. Lucie Unit # 2 TC # 2-95-11-450 <sup>RPD 467</sup>

Procedure Title: CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

Procedure Number: 2-1120070 Rev. 1

Reason for change: TYPOGRAPHICAL ERRORS IN VALUES IN STEPS  
9.5.6, 9.5.7, 9.5.8, 9.6.1, 9.6.3, 9.8, DATA SHEET 40C AND 41C

Originator: FRANK GUZMANO Phone: 7355 Date: 11/3/95

**B Procedural Controls: (Originator to complete)**

Yes No

☐ ☒ Is the intent of the procedure altered? (Tech. Spec. 6.8.3.A) If yes, a TC is NOT applicable. A PCR is required.

☐ ☒ Is this Temporary Change for a one-time use? If no, this TC may be used up to 90 days, and the responsible Dept. Head or designee shall ensure a procedure change request incorporating this TC is developed, approved and submitted for FRG approval. If yes, this TC can be executed one time only.

Department Head or Designee [Signature] 11/03/95

☐ ☒ Is this T.C. for a Q.I.? If yes, the Quality Manager or designee and the Dept. Head or designee who is jurisdictionally responsible for the Q.I. shall sign.

Quality Manager or Designee \_\_\_\_\_

Department Head or Designee \_\_\_\_\_

**C Temporary Change Contents: (Originator to complete)**

Does this Change:

Yes No

☐ ☒ Incorporate complex or extensive changes? If Yes, Subcommittee required. \_\_\_\_\_  
Subcommittee Initials

☐ ☒ Modify instrument setpoints?

☐ ☒ Delete an independent verification?

☐ ☒ Alter a QC holdpoint?

☐ ☒ Modify a procedural step which alters a regulatory requirement as identified in the procedure?

☐ ☒ Alter the first execution of a procedure? (Prep. LOI)

☐ ☒ Addition of any chemicals?

**NOTE**

If any of the above criteria are marked yes, prior FRG review is required.

**FIGURE 4**  
**TEMPORARY CHANGE REQUEST**  
(Page 2 of 3)

|  |   | Yes  | No     |
|--|---|--|--------|
| D  | <b>10 CFR 50.59 Screening</b>   |  |        |
|  | 1. Does the change represent a change to the facility as described in the SAR?          | _____  | _____✓ |
|  | 2. Does the change represent a change to procedures as described in the SAR?            | _____  | _____✓ |
|  | 3. Is the change associated with a test or experiment not described in the SAR?         | _____  | _____✓ |
|  | 4. Could the change affect nuclear safety in a way not previously evaluated in the SAR? | _____  | _____✓ |
|  | 5. Does the change require a change to the Technical Specifications?                    | _____  | _____✓ |
| <p><b>NOTE</b><br/>If the answer to <u>ALL</u> the above 10 CFR 50.59 screening questions are no. (Questions 1 - 5), then a safety evaluation is not required.</p> |   |  |        |
| STA review (signature) <u><i>Stavros Nikolak</i></u>   |   | Date <u>11 / 3 / 95</u>  |        |
| E  | Does this change: (NPS to complete)   |  |        |
|  | Yes    No   |  |        |
|  | <input type="checkbox"/> <input checked="" type="checkbox"/>                            | Compromise the separation of redundant trains of equipment?  |        |
|  | <input type="checkbox"/> <input checked="" type="checkbox"/>                            | Potentially isolate pressure reliefs?  |        |
|  | <input checked="" type="checkbox"/> <input type="checkbox"/>                            | Defeat automatic signals?  |        |
|  | <input type="checkbox"/> <input checked="" type="checkbox"/>                            | Defeat mechanical or electrical interlocks?  |        |
|  | <input type="checkbox"/> <input checked="" type="checkbox"/>                            | Alter the completion of an evolution due to an operator work around.   |        |
| If yes, authorization from the Plant General Manager or Site Vice President shall be obtained.   |   |  |        |
|  |   | <u><i>Stavros</i></u> Date <u>11 / 4 / 95</u>  |        |
|  | Yes    No   |  |        |
|  | <input checked="" type="checkbox"/> <input type="checkbox"/>                            | Prior FRG review required?   |        |
| <p><b>NOTE</b><br/>If any of the above criteria are marked yes, discuss possible alternatives with the originator.</p>   |   |  |        |
| NPS Signature <u><i>Stavros</i></u>  |   | Date <u>11 / 3 / 95</u>  |        |
| F  | <b>FRG Review:</b>  |  |        |
|  | Plant General Manager Approval <u><i>W. J. ...</i></u>                                  | Date <u>11 / 4 / 95</u>  |        |
|  | FRG Number <u>95-371</u>  | This change shall be reviewed (if prior FRG review is not required) by the Facility Review Group and approved by the Plant General Manager within 14 days of the authorization date. (Tech. Spec. 6.8.3.C) |        |
|  | <input checked="" type="checkbox"/> Prior <input type="checkbox"/> Post                 |  |        |

**FIGURE 4**  
**TEMPORARY CHANGE REQUEST**  
(Page 3 of 3)

|   |   |                                    |
|---|---|------------------------------------|
| G | Approval: (This change shall have prior approval by a <b>NPS</b> and one member of the <b>plant management staff.</b> ) (Tech. Spec. 6.8.3.B) |                                    |
|   | Plant Management Staff Signature <u><i>Frank J. [unclear]</i></u>   | Date <u>11/3/95</u>                |
|   | NPS Signature <u><i>[unclear]</i></u>   | Authorization Date <u>11/19/95</u> |
| H | Cancellation Authorization _____ (NPS/ANPS) Date ____/____/____   |                                    |
|   | Reason: _____   |                                    |



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE: (continued)

9.4 (continued)

3. Remove the current source from the input connector and reconnect the detector cable.

NOTE

The following steps are to be performed if the as found values of the board are out of tolerance. This calibration will be performed in two steps. First the ANALOG CIRCUIT ADJUSTMENTS, and second the DIGITAL CIRCUIT ADJUSTMENTS. It is critical that the ANALOG section is performed first and that the desired values are as close as physically possible. Be patient, some of the ANALOG adjustments are slow and sensitive.

9.5 ANALOG CIRCUIT ADJUSTMENT

1. Disconnect the field cable from the input connector.
2. Place a DVM on TP-1(+) and TP-2(-). (vdc)
3. Short the input connector to ground and adjust balance pot R-15 to the point where the voltage jumps from 6 to 13 volts. This will be approximately 6 volts.
4. Remove the short from the input connector and connect the current source.
5. Place the DVM on TP-3(+) and TP-2(-). (vdc)

Perform steps 9.5.6 and 9.5.7 until both readings are in tolerance and they will repeat. These adjustments effect each other so it will take several attempts to get the desired values.

TC 2-95-467  
EF 467  
450  
EP

$1.0 \text{ E-}9$

6. Input  $1.0 \text{ E-}9$  current and adjust zero pot R-19 for a value of 3.283 to 3.383 vdc. (optimum 3.333 vdc.)

/R1

ST. LUCIE UNIT 2  
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CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE: (continued)

## 9.5 (continued)

- TC # 2-95-11-450 R-467
7. Input ~~10E-4~~<sup>1.0E-4</sup> current and adjust span pot R-22 for a value of 8.839 to 8.939 vdc. (optimum 8.889 vdc.)

NOTE

Make small adjustments on R-15 and move back away from the board. Wait for the reading to settle before adjusting any more. Continue adjusting R-15 until you get 0.000 vdc.

- TC # 2-95-11-450 R-467
8. Input ~~10E-12~~<sup>1.0E-12</sup> current and adjust balance pot R-15 for a value of -0.050 to +0.050 vdc. (optimum 0.000 vdc.)
9. Check steps 9.5.6, 9.5.7, and 9.5.8 to verify that the readings are within tolerance and record the values below:

## RIM-26-40

## RIM-26-41

Step 9.5.6 = \_\_\_\_\_ vdc

Step 9.5.6 = \_\_\_\_\_ vdc

Step 9.5.7 = \_\_\_\_\_ vdc

Step 9.5.7 = \_\_\_\_\_ vdc

Step 9.5.8 = \_\_\_\_\_ vdc

Step 9.5.8 = \_\_\_\_\_ vdc

10. This completes the ANALOG CIRCUIT ADJUSTMENT. Proceed with step 9.6.

9.6 DIGITAL CIRCUIT ADJUSTMENT

- TC # 2-95-11-450 R-467
1. Input ~~10E-4~~<sup>1.0E-4</sup> current and verify the voltage at TP-3 is 8.839 to 8.939 vdc. (optimum 8.889)
2. Adjust span pot R-33 to provide a display of 1.00E+08 on the RM-23. (channel item 005)
- TC # 2-95-11-450 R-467
3. Input ~~10E-11~~<sup>1.0E-11</sup> current and verify the voltage is approximately 1.11 vdc. (1 to 2 vdc)



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2

9.0 DETAILED PROCEDURE: (continued)

9.8 SOURCE VERIFICATION

NOTE

1. Measure and adjust the detector high voltage power supply for a value of 875 vdc. Record on Data Sheet C.
2. At this point the monitor is ready for a source verification check using the General Atomics source RT-11. Request that HP perform the calculations for the RT-11 and enter that desired value into step 9.8.2 on Data Sheet C.

CAUTION

3. Request HP to hang the RT-11 source on the detector of the monitor under test. Record the activity (CI007) on Data Sheet C.
4. ~~Perform this procedure on the remaining monitor and~~ Verify that all values on Data Sheet 40C and 41C are within the indicated tolerances.

RIM-26-40 Performed by \_\_\_\_\_ / /

RIM-26-41 Performed by \_\_\_\_\_ / /

Reviewed by \_\_\_\_\_ / /

NOTE

IN MODE 5 OR 6, STEP 9.8 MAY BE PERFORMED AFTER BOTH CHANNELS 40 AND 41 HAVE BEEN CALIBRATED IN THE CONTROL ROOM.

CAUTION

WHEN SOURCE TESTING THE HIGH RANGE DETECTORS, BYPASS THE APPROPRIATE ESFAS - CIS CHANNELS DUE TO THE CLOSE PROXIMITY OF THE DETECTORS

3. WHEN TESTING CHANNEL #40, BYPASS THE CONT. RADIATION - CIS MA CHANNEL IN ESFAS  
 PERFORMED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 VERIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 WHEN TESTING CHANNEL #41, BYPASS THE CONT. RADIATION - CIS MC CHANNEL IN ESFAS  
 PERFORMED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 VERIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

5. WHEN TESTING OF A CHANNEL IS COMPLETED, REMOVE THE ESFAS - CIS CHANNEL PREVIOUSLY BYPASSED AND PROCEED TO THE REMAINING CHANNEL.

CHANNEL # 40: PERFORMED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 VERIFIED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHANNEL # 41: PERFORMED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 VERIFIED BY \_\_\_\_\_ DATE \_\_\_\_\_

TC# 2-95-4-450  
467

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DATA SHEET 40C  
LOG PICO-AMP BOARD/DETECTOR CALIBRATION RIM-26-40

DVM used: PSLCurrent source used: PSL

LOG PICO AMP BOARD CALIBRATION CHECK

| INPUT<br>CURRENT | DESIRED<br>CPM | AS FOUND<br>CPM | AS LEFT<br>CPM | ERROR |       |
|------------------|----------------|-----------------|----------------|-------|-------|
|                  |                |                 |                | +20%  | -17%  |
| 1.0<br>10E-11    | 1.0<br>10E+1   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-10    | 1.0<br>10E+2   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-9     | 1.0<br>10E+3   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-8     | 1.0<br>10E+4   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-7     | 1.0<br>10E+5   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-6     | 1.0<br>10E+6   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-5     | 1.0<br>10E+7   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-4     | 1.0<br>10E+8   | _____           | _____          | _____ | _____ |
| 1.0<br>10E-3     | 1.0<br>10E+9   | _____           | _____          | _____ | _____ |

Step 9.8.1 Detector high voltage = \_\_\_\_\_ vdc (865 to 885 vdc)

Step 9.8.2 RT-11 desired value = \_\_\_\_\_ R/hr (high side)

= \_\_\_\_\_ R/hr (low side)

\* Step 9.8.3 Actual activity value = \_\_\_\_\_ R/hr (high side)

= \_\_\_\_\_ R/hr (low side)

\* Actual activity must equal the desired values recorded in step 9.8.2  $\pm 15\%$ .



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CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

DATA SHEET 41C  
LOG PICO-AMP BOARD/DETECTOR CALIBRATION RIM-26-41

DVM used: PSLCurrent source used: PSL

LOG PICO AMP BOARD CALIBRATION CHECK

| INPUT<br>CURRENT         | DESIRED<br>CPM          | AS FOUND<br>CPM | AS LEFT<br>CPM | ERROR |       |
|--------------------------|-------------------------|-----------------|----------------|-------|-------|
|                          |                         |                 |                | +20%  | -17%  |
| 1.0<br><del>10E-11</del> | 1.0<br><del>10E+1</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-10</del> | 1.0<br><del>10E+2</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-9</del>  | 1.0<br><del>10E+3</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-8</del>  | 1.0<br><del>10E+4</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-7</del>  | 1.0<br><del>10E+5</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-6</del>  | 1.0<br><del>10E+6</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-5</del>  | 1.0<br><del>10E+7</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-4</del>  | 1.0<br><del>10E+8</del> | _____           | _____          | _____ | _____ |
| 1.0<br><del>10E-3</del>  | 1.0<br><del>10E+9</del> | _____           | _____          | _____ | _____ |

Step 9.8.1 Detector high voltage = \_\_\_\_\_ vdc (865 to 885 vdc)

Step 9.8.2 RT-11 desired value = \_\_\_\_\_ R/hr (high side)

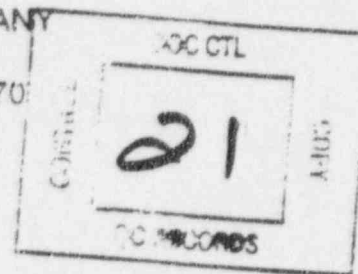
= \_\_\_\_\_ R/hr (low side)

\* Step 9.8.3 Actual activity value = \_\_\_\_\_ R/hr (high side)

= \_\_\_\_\_ R/hr (low side)

\* Actual activity must equal the desired values recorded in step 9.8.2  $\pm 15\%$ .

FLORIDA POWER & LIGHT COMPANY  
ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070  
REVISION 1

1.0 TITLE:

CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group \_\_\_\_\_ March 19, 1989

Approved by \_\_\_\_\_ G. J. Boissy \_\_\_\_\_ Plant Manager \_\_\_\_\_ June 5, 1989

Revision 1 Reviewed by FRG \_\_\_\_\_ 06/13 1991

Approved by \_\_\_\_\_ G. J. Boissy \_\_\_\_\_ Plant Manager \_\_\_\_\_ 07/03 1991

3.0 PURPOSE:

3.1 To satisfy surveillance requirements as per Technical Specification Table 4.3-3.

3.2 To verify the operation and calibration of the containment high range radiation monitors, RIM-26-40 and RIM-26-41.

4.0 PRECAUTIONS AND LIMITS:

4.1 High voltage exists on detector cable #20443 A for RIM-26-40 and 20443 E for RIM-26-41 of approximately 875 vdc.

5.0 RELATED SYSTEM STATUS:

5.1 Due to the location of the detectors, this procedure must be performed while the plant is in mode 3, 5, or 6.

6.0 REFERENCES:

6.1 CWD 2998-B-327 Sheet 443.

6.2 Technical Manual 2998-15891.

|                |           |
|----------------|-----------|
| S 2 OPS        |           |
| DATE           | _____     |
| DOCT PROCEDURE | _____     |
| DOCH           | 2-1120070 |
| SYS            | _____     |
| COMP COMPLETED | _____     |
| ITM            | 1         |

Def. 18/pk  
4704-890213

10-20-95

RMK

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

7.0 RECORDS REQUIRED:

- 7.1 A copy of this procedure shall be maintained in the plant files in accordance with QI 17-PR/PSL-1, "Quality Assurance Records."

8.0 MATERIALS AND EQUIPMENT REQUIRED:

- 8.1 Current source, Keithly Model 220 equivalent or better. PSL 542
- 8.2 Voltmeter, Keithly Model 197 equivalent or better. PSL 663/
- 8.3 Radiation source RT-11. (General Atomics) Located in HP safe.
- 8.4 All interfacing with the RM-80 under test will be performed with its RM-23 located at the Control Room Radiation Monitoring Panel. (Designated as RC-26-40 or 41).

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE:

9.1 PREPARATION

1. Verify that AC power is on. At the Control Radiation Monitoring Panel, place the NORMAL/SUPERVISOR key switch to the SUPERVISOR position for the Monitor under test.
2. For RIM-26-40, use Data sheets 40A, 40B, and 40C.  
For RIM-26-41, use Data sheets 41A, 41B, and 41C.

In the procedure the data sheets will be referred to as either A, B, or C.

9.2 ALERT AND HIGH ALARM TESTS

1. Verify/Record the following values on Data sheet A.
  - A. Alert alarm setpoint. (CI 010) =  $6.40\text{E}+00$  R/HR
  - B. High alarm setpoint. (CI 009) =  $8.00\text{E}+00$  R/HR
  - C. Conversion factor. (CI 011) = record value

NOTE

For step 9.2.2, the value of  $1.00\text{E}+03$  was arbitrarily chosen to achieve a high and alert condition.

2. Enter a value of  $1.00\text{E}+03$  into channel item 011. With the RM-80 in an alert and high alarm condition, verify the following:
  - A. Alert alarm LED on RM-23 is lit.
  - B. High alarm LED on RM-23 is lit.
3. Return channel item 011 to the value recorded in step 9.2.1.C and verify the alert and high alarms have reset on Data Sheet A.

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I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE: (continued)

## 9.3 LOSS OF COUNTS TEST

1. On Data Sheet A, record the following channel items:
  - A. Channel item 020
  - B. Channel item 024
2. Enter a value of 5.00E+00 in channel item 024.
3. Enter a value of 001 in channel item 020.
4. Verify that in approximately one minute, the following occurs:
  - A. Operate LED on the RM-23 extinguishes.
  - B. Operate light on the RM-80 extinguishes.
5. Return channel items 020 and 024 to the values recorded in step 9.3.1.A and 9.3.1.B.
6. Verify that the operate light on the RM-23 and RM-80 are back on.

RIM-26-40

RMK

RIM-26-41

JP

## 9.4 LOG/PICO-AMP BOARD CALIBRATION CHECK

/R1

1. Disconnect the detector cable from the LOG/PICO AMP board inside the RM-80. Connect the Pico-amp current source to the input connector on the board. /R1
2. Input the current values on Data Sheet C and record the as found values. If all values are within the indicated tolerance proceed to step 9.8. If any value is out of tolerance, proceed with step 9.5. /R1

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE: (continued)

9.4 (continued)

3. Remove the current source from the input connector and reconnect the detector cable.

NOTE

The following steps are to be performed if the as found values of the board are out of tolerance. This calibration will be performed in two steps. First the ANALOG CIRCUIT ADJUSTMENTS, and second the DIGITAL CIRCUIT ADJUSTMENTS. It is critical that the ANALOG section is performed first and that the desired values are as close as physically possible. Be patient, some of the ANALOG adjustments are slow and sensitive.

9.5 ANALOG CIRCUIT ADJUSTMENT

1. Disconnect the field cable from the input connector.
2. Place a DVM on TP-1(+) and TP-2(-). (vdc)
3. Short the input connector to ground and adjust balance pot R-15 to the point where the voltage jumps from 6 to 13 volts. This will be approximately 6 volts.
4. Remove the short from the input connector and connect the current source.
5. Place the DVM on TP-3(+) and TP-2(-). (vdc)

Perform steps 9.5.6 and 9.5.7 until both readings are in tolerance and they will repeat. These adjustments effect each other so it will take several attempts to get the desired values.

- TC # 2-95 <sup>EF 467</sup> <sub>450</sub> <sub>RP</sub>
- 1.0 E-9
6. Input ~~1.0E-9~~ current and adjust zero pot R-19 for a value of 3.283 to 3.383 vdc. (optimum 3.333 vdc.)



ST. LUCIE UNIT 2  
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9.0 DETAILED PROCEDURE: (continued)

## 9.5 (continued)

- TC # 2-95-11-467  
7. Input  $1.0E-4$  current and adjust span pot R-22 for a value of 8.839 to 8.939 vdc. (optimum 8.889 vdc.)

NOTE

Make small adjustments on R-15 and move back away from the board. Wait for the reading to settle before adjusting any more. Continue adjusting R-15 until you get 0.000 vdc.

- TC # 2-95-11-467  
8. Input  $1.0E-12$  current and adjust balance pot R-15 for a value of -0.050 to +0.050 vdc. (optimum 0.000 vdc.)
9. Check steps 9.5.6, 9.5.7, and 9.5.8 to verify that the readings are within tolerance and record the values below:

## RIM-26-40

Step 9.5.6 = 3.325 vdcStep 9.5.7 = 3.380 vdcStep 9.5.8 = 0.010 vdc

## RIM-26-41

Step 9.5.6 =  $\frac{N/A}{R_{lim}}$  vdcStep 9.5.7 =  $\frac{N/A}{R_{lim}}$  vdcStep 9.5.8 =  $\frac{N/A}{R_{lim}}$  vdc

10. This completes the ANALOG CIRCUIT ADJUSTMENT. Proceed with step 9.6.

## 9.6 DIGITAL CIRCUIT ADJUSTMENT

- TC # 2-95-11-467  
1. Input  $1.0E-4$  current and verify the voltage at TP-3 is 8.839 to 8.939 vdc. (optimum 8.889)
2. Adjust span pot R-33 to provide a display of 1.00E+08 on the RM-23. (channel item 005)
- TC # 2-95-11-467  
3. Input  $1.0E-11$  current and verify the voltage is approximately 1.11 vdc. (1 to 2 vdc)



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9.0 DETAILED PROCEDURE: (continued)

## 9.6 (continued)

4. Adjust zero pot R-34 to provide a display of 1.00E+01 on the RM-23.  
(channel item 005)
5. Perform steps 9.6.1 through 9.6.4 several times to assure repeatability.
6. This completes the DIGITAL CIRCUIT ADJUSTMENT. Disconnect the DVM from TP-3.
7. Decade through the input current values on Data Sheet C to verify linearity and record the as left values.
8. Disconnect the current source and reconnect the detector to the LOG/PICO AMP board.

R. Kuykendall 11/6/95  
I.V. J. Lomant 11/6/95

## 9.7 LOOP CALIBRATION

The next step will place the monitor in the test mode. Entering different values into monitor item #052, the analog outputs can be exercised.

1. Locate Data Sheet B for the monitor under test. Using the RM-23, enter a value of 063 into monitor item #049.
2. Using Data Sheet B, vary the value in monitor item #052 and verify/calibrate the RM-80 output and recorder indications.  
(RR-26-40 & 41 located on the Rad. Mon. Panel)
3. Upon completion of loop calibration, return monitor item #052 to 255, and monitor item #063 to a value of 061.

RIM-26-40 RMK      RIM-26-41 7

ST. LUCIE UNIT 2  
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CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

9.0 DETAILED PROCEDURE: (continued)

## 9.8 SOURCE VERIFICATION

NOTE

1. Measure and adjust the detector high voltage power supply for a value of 875 vdc. Record on Data Sheet C.
2. At this point the monitor is ready for a source verification check using the General Atomics source RT-11. Request that HP perform the calculations for the RT-11 and enter that desired value into step 9.8.2 on Data Sheet C.

CAUTION

4. 3. Request HP to hang the RT-11 source on the detector of the monitor under test. Record the activity (CI007) on Data Sheet C.
6. 4. ~~Perform this procedure on the remaining monitor and~~ Verify that all values on Data Sheet 40C and 41C are within the indicated tolerances.

RIM-26-40

Performed by

R. Kuykendall 11/19/95

RIM-26-41

Performed by

R. Kuykendall 11/19/95

Reviewed by

1/1NOTE

IN MODE 5 OR 6, STEP 9.8 MAY BE PERFORMED AFTER BOTH CHANNELS 40 AND 41 HAVE BEEN CALIBRATED IN THE CONTROL ROOM.

CAUTION

WHEN SOURCE TESTING THE HIGH RANGE DETECTORS, BYPASS THE APPROPRIATE ESFAS - CIS CHANNELS DUE TO THE CLOSE PROXIMITY OF THE DETECTORS

3. WHEN TESTING CHANNEL #40, BYPASS THE CONT. RADIATION - CIS MA CHANNEL IN ESFAS  
 PERFORMED BY: RMK DATE: 11-19-95  
 VERIFIED BY: EG DATE: 11-19-95  
 WHEN TESTING CHANNEL #41, BYPASS THE CONT. RADIATION - CIS MC CHANNEL IN ESF  
 PERFORMED BY: RMK DATE: 11-19-95  
 VERIFIED BY: EG DATE: 11-19-95

5. WHEN TESTING OF A CHANNEL IS COMPLETED, REMOVE THE ESFAS - CIS CHANNEL PREVIOUSLY BYPASSED AND PROCEED TO THE REMAINING CHANNEL.

|               |              |            |      |                 |
|---------------|--------------|------------|------|-----------------|
| CHANNEL # 40: | PERFORMED BY | <u>RMK</u> | DATE | <u>11-19-95</u> |
|               | VERIFIED BY  | <u>EG</u>  | DATE | <u>11-19-95</u> |
| CHANNEL # 41: | PERFORMED BY | <u>RMK</u> | DATE | <u>11-19-95</u> |
|               | VERIFIED BY  | <u>EG</u>  | DATE | <u>11-19-95</u> |

TC# 2-95-H-450  
467

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

**DATA SHEET 40A**  
**ALARM VERIFICATION RIM-26-40**

**ALERT AND HIGH ALARM TEST**

|            |                                 |                     |
|------------|---------------------------------|---------------------|
| STEP 9.2.1 | A. Alert alarm setpoint (CI010) | = <u>6.4 E+0</u>    |
|            | B. High alarm setpoint (CI009)  | = <u>8.0 E+0</u>    |
|            | C. Conversion factor (CI011)    | = <u>1.35 E-1</u>   |
| STEP 9.2.2 | A. Verify alert alarm (initial) | <u>  <i>g</i>  </u> |
|            | B. Verify high alarm (initial)  | <u>  <i>g</i>  </u> |
| STEP 9.2.3 | Verify alarms have reset        | <u>  <i>g</i>  </u> |

**LOSS OF COUNTS TEST**

|            |                                     |                     |
|------------|-------------------------------------|---------------------|
| STEP 9.3.1 | A. Loss of counts time (CI020)      | = <u>10</u>         |
|            | B. Low current alarm (CI024)        | = <u>5.0 E-2</u>    |
| STEP 9.3.4 | A. RM-23 Operate Light extinguishes | <u>  <i>g</i>  </u> |
|            | B. RM-80 Operate Light extinguishes | <u>  <i>g</i>  </u> |

**NOTE**

There is not a Unit 2 Technical Specification requirement for alarm setpoints on these monitors. To be consistent with the requirements for Unit 1, the alert and high alarm setpoints will be entered as per the following:

Alert alarm (CI 010) = 6.40E+00 R/HR  
High alarm (CI 009) = 8.00E+00 R/HR

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

**DATA SHEET 40B**  
**LOOP CALIBRATION R/M-26-40**

| Input |     |          | Test Point                          |          |         | Total Tol.<br>.08<br>MADC | Test Point          |                      |         | Total Tol.<br>+1, -2<br>x 10 <sup>0</sup> |
|-------|-----|----------|-------------------------------------|----------|---------|---------------------------|---------------------|----------------------|---------|---|
|       |     | Mon Item | RM-80 J-BOX TB-4, 5<br>accuracy .5% |          |         |                           | RR-26-40            | R/hr<br>accuracy .5% |         |   |
| Pt.   | %   | 052      | Desired                             | As Found | As Left | Error                     | Desired             | As Found             | As Left | Error                                     |
| 1     | 0   | 0        | 3.92 - 4.08                         | 4.00     | -       |                           | 1 X 10 <sup>0</sup> | 1.2 E+0              |         | .2  |
| 2     | 25  | 64       | 7.92 - 8.08                         | 8.03     | .03     | As                        | 1 X 10 <sup>2</sup> | 1.0 E+2              |         | -   |
| 3     | 50  | 128      | 11.92 - 12.08                       | 12.04    | .04     | -                         | 1 X 10 <sup>4</sup> | 1.0 E+4              | As      | -   |
| 4     | 75  | 191      | 15.92 - 16.08                       | 15.99    | .01     | Found                     | 1 X 10 <sup>6</sup> | 1.0 E+6              |         | -   |
| 5     | 100 | 255      | 19.92 - 20.08                       | 20.00    | -       | -                         | 1 X 10 <sup>8</sup> | 1.0 E+8              | Found   | -   |
| 4     | 75  | 191      | 15.92 - 16.08                       | 15.99    | .01     |                           | 1 X 10 <sup>6</sup> | 1.0 E+6              |         | -   |
| 3     | 50  | 128      | 11.92 - 12.08                       | 12.04    | .04     |                           | 1 X 10 <sup>4</sup> | 1.0 E+4              |         | -   |
| 2     | 25  | 64       | 7.92 - 8.08                         | 8.03     | .03     |                           | 1 X 10 <sup>2</sup> | 1.0 E+2              |         | -   |
| 1     | 0   | 0        | 3.92 - 4.08                         | 4.00     | -       |                           | 1 X 10 <sup>0</sup> | 1.2 E+0              |         | .2  |

**NOTE**

Connect DVM in series with current signal at the J-BOX TB4 4, to obtain test point readings.

COMMENTS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

DATA SHEET 40C  
LOG PICO-AMP BOARD/DETECTOR CALIBRATION RIM-26-40

DVM used: PSLCurrent source used: PSL

LOG PICO AMP BOARD CALIBRATION CHECK

| INPUT<br>CURRENT | DESIRED<br>CPM | AS FOUND<br>CPM | AS LEFT<br>CPM | ERROR<br>+20%    -17% |
|------------------|----------------|-----------------|----------------|-----------------------|
| 1.0<br>10E-11    | 1.0<br>10E+1   | *               | 1.00E+1        | -                     |
| 1.0<br>10E-10    | 1.0<br>10E+2   |                 | 1.0E+2         | -                     |
| 1.0<br>10E-9     | 1.0<br>10E+3   |                 | 1.0E+3         | -                     |
| 1.0<br>10E-8     | 1.0<br>10E+4   |                 | 1.0E+4         | -                     |
| 1.0<br>10E-7     | 1.0<br>10E+5   |                 | 1.0E+5         | -                     |
| 1.0<br>10E-6     | 1.0<br>10E+6   |                 | 1.0E+6         | -                     |
| 1.0<br>10E-5     | 1.0<br>10E+7   |                 | 1.0E+7         | -                     |
| 1.0<br>10E-4     | 1.0<br>10E+8   |                 | 1.0E+8         | -                     |
| 1.0<br>10E-3     | 1.0<br>10E+9   | ↓               | 9.97E+8        | .03                   |

Step 9.8.1 Detector high voltage = 875 vdc (865 to 885 vdc)Step 9.8.2 RT-11 desired value = 7.772 R/hr (high side)= 2.141 R/hr (low side)\* Step 9.8.3 Actual activity value = 8.85E+0 R/hr (high side)= 2.27E+0 R/hr (low side)\* Actual activity must equal the desired values recorded in step 9.8.2  $\pm 15\%$ .

\* original data taken was misplaced but was out of cal. Would not reach top of scale 1.0E+9 CPM. R. Kuykendall  
High Range 8.938  $\rightarrow$  6.606 R/m  
Low Range 2.462  $\rightarrow$  1.820 R/m  
11-19-95



ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

**DATA SHEET 41A**  
**ALARM VERIFICATION RIM-26-41**

**ALERT AND HIGH ALARM TEST**

|            |                                 |                    |
|------------|---------------------------------|--------------------|
| STEP 9.2.1 | A. Alert alarm setpoint (CI010) | = <u>6.4 E+0</u>   |
|            | B. High alarm setpoint (CI009)  | = <u>8.0 E+0</u>   |
|            | C. Conversion factor (CI011)    | = <u>1.27 E-1</u>  |
| STEP 9.2.2 | A. Verify alert alarm (initial) | <u>[Signature]</u> |
|            | B. Verify high alarm (initial)  | <u>[Signature]</u> |
| STEP 9.2.3 | Verify alarms have reset        | <u>[Signature]</u> |

**LOSS OF COUNTS TEST**

|            |                                     |                    |
|------------|-------------------------------------|--------------------|
| STEP 9.3.1 | A. Loss of counts time (CI020)      | = <u>10</u>        |
|            | B. Low current alarm (CI024)        | = <u>5.0 E-1</u>   |
| STEP 9.3.4 | A. RM-23 Operate Light extinguishes | <u>[Signature]</u> |
|            | B. RM-80 Operate Light extinguishes | <u>[Signature]</u> |

**NOTE**

There is not a Unit 2 Technical Specification requirement for alarm setpoints on these monitors. To be consistent with the requirements for Unit 1, the alert and high alarm setpoints will be entered as per the following:

Alert alarm (CI 010) = 6.40E+00 R/HR  
High alarm (CI 009) = 8.00E+00 R/HR

Performed by [Signature] / [Signature] Date 11/7/95

Reviewed by [Signature] Date 12/9/95

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REVISION 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR CALIBRATION

**DATA SHEET 41B**  
**LOOP CALIBRATION RIM-26-41**

| Input |     |          | Test Point  |          |         | Total Tol. | Test Point          |          |         | Total Tol.               |
|-------|-----|----------|---|----------|---------|------------|---------------------|----------|---------|--------------------------|
|       |     | Mon Item | RM-80 J-BOX TB-4, 4 & 5 <i>20</i><br>accuracy .5% |          |         | .08 MADC   | RR-26-41            | R/hr     |         | +1, -2 x 10 <sup>4</sup> |
| Pt.   | %   | 052      | Desired   | As Found | As Left | Error      | Desired             | As Found | As Left | Error                    |
| 1     | 0   | 0        | 3.92 - 4.08                                       | 4.04     | 4.00    | -          | 1 X 10 <sup>0</sup> | 1 E+0    | 1       | 0                        |
| 2     | 25  | 64       | 7.92 - 8.08                                       | 8.05     | 8.01    | .01        | 1 X 10 <sup>2</sup> | 1 E+2    | LEFT    | 0                        |
| 3     | 50  | 128      | 11.92 - 12.08                                     | 12.08    | 12.04   | .04        | 1 X 10 <sup>4</sup> | 1 E+4    | AS      | 0                        |
| 4     | 75  | 191      | 15.92 - 16.08                                     | 16.02    | 15.98   | .02        | 1 X 10 <sup>6</sup> | 1 E+6    |         | 2                        |
| 5     | 100 | 255      | 19.92 - 20.08                                     | 20.04    | 20.00   | -          | 1 X 10 <sup>8</sup> | 1 E+8    | FOUND   | 0                        |
| 4     | 75  | 191      | 15.92 - 16.08                                     | 16.02    | 15.98   | .02        | 1 X 10 <sup>6</sup> | 1 E+6    | 1       | 0                        |
| 3     | 50  | 128      | 11.92 - 12.08                                     | 12.08    | 12.04   | .04        | 1 X 10 <sup>4</sup> | 1 E+4    |         | 0                        |
| 2     | 25  | 64       | 7.92 - 8.08                                       | 8.05     | 8.01    | .01        | 1 X 10 <sup>2</sup> | 1 E+2    |         | 0                        |
| 1     | 0   | 0        | 3.92 - 4.08                                       | 4.04     | 4.00    | -          | 1 X 10 <sup>0</sup> | 1 E+0    | 1       | 0                        |

**NOTE**

Connect DVM in series with current signal at the J-BOX TB4 4, to obtain test point readings.

COMMENTS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ST. LUCIE UNIT 2  
I & C PROCEDURE NO. 2-1120070, REV. 1  
CONTAINMENT HIGH RANGE RADIATION MONITOR ALIBRATION

DATA SHEET 41C  
LOG PICO-AMP BOARD/DETECTOR CALIBRATION

M-26-41

DVM used: PSL 663Current  
ce used: PSL 542

## LOG PICO AMP BOARD CALIBRATION CHECK

| INPUT<br>CURRENT         | DESIRED<br>CPM          | AS FOUND<br>CPM | AS LEFT<br>CPM | +20R<br>.17% |
|--------------------------|-------------------------|-----------------|----------------|--------------|
| 1.0<br><del>10E-11</del> | 1.0<br><del>10E+1</del> | <u>9.42 E+0</u> |                |              |
| 1.0<br><del>10E-10</del> | 1.0<br><del>10E+2</del> | <u>9.97 E+1</u> |                | .0           |
| 1.0<br><del>10E-9</del>  | 1.0<br><del>10E+3</del> | <u>9.97 E+2</u> | AS             | .03          |
| 1.0<br><del>10E-8</del>  | 1.0<br><del>10E+4</del> | <u>9.97 E+3</u> |                | .03          |
| 1.0<br><del>10E-7</del>  | 1.0<br><del>10E+5</del> | <u>9.97 E+4</u> | Found          | .03          |
| 1.0<br><del>10E-6</del>  | 1.0<br><del>10E+6</del> | <u>9.97 E+5</u> |                | .03          |
| 1.0<br><del>10E-5</del>  | 1.0<br><del>10E+7</del> | <u>9.97 E+6</u> |                | .03          |
| 1.0<br><del>10E-4</del>  | 1.0<br><del>10E+8</del> | <u>9.97 E+7</u> |                | .03          |
| 1.0<br><del>10E-3</del>  | 1.0<br><del>10E+9</del> | <u>9.97 E+8</u> |                | .03          |

Step 9.8.1 Detector high voltage = 875 vdc (865 to 885 vdc)Step 9.8.2 RT-11 desired value = 7.772 R/hr (high side)= 2.141 R/hr (low side)\* Step 9.8.3 Actual activity value = 8.65E0 R/hr (high side)= 2.42E0 R/hr (low side)\* Actual activity must equal the desired values recorded in step 9.8.2  $\pm 15\%$ .

high Range 8.938  $\rightarrow$  6.606 R/hr  
low Range 2.462  $\rightarrow$  1.820 R/hr

Component: Sys: 26 Train:  
 Associate: Assign Priority: A  
 Name: T.S./RIS-26-31/32, CNTMT PART C Work Type: 7  
 H.31/GAS CH.32 RATEMETERS (ACMP)  
 Location: RAB/RAD MNTR PNL LMD: 2  
 Defect/Request: T.S./RIS-26-31/32 CAL, CNTMT PART C  
 H.31

Pac: PSL Unit: 01  
 MASTER  
 WORK ORDER TASK  
 96014915 01  
 ER/PWO: 63 / 5692  
 Chg Loc: 915  
 PAGE 1 of 5

## Detailed Explanation:

PM ID: FYP26001  
 DUE BY DT: 06/17/96 EARLY DT: 02/03/96 LATE DT: 10/30/96

Work Request: Def Tag: Loc: More:  
 Trbl/Brkdown: LCO: Unit Cond Req:  
 NPRDS: N Fail Date: Time: Stat: Symp:  
 Originator: Date: Dept:  
 Approve By: Date:

## Task Determination Data:

|                         |                      |                  |
|-------------------------|----------------------|------------------|
| IST Required : N        | NCR/CR : N/A         | Safety Class: QR |
| PMT Required : Y        | PCM : N/A            | Q Group : N/A    |
| 10 CFR 50.49 : N        | EQ Doc Pkg : N/A     | Assign To : FG 1 |
| Reg Guide 1.97 : N      | Seismic Cat :        | Est M/H : 8.00   |
| ASME XI (ISI) Req'd : N | Scaffold Req : N     | Crew Qty : 1     |
| Security Clearance: N   | Fire Prot Req: N     | Insul Rem : N    |
| Clearance Required: N   | Clearance No :       |                  |
| Required: Y RWP No: 5   | RCA M/H: L1: 6.0 L2: | L3:              |

Requirements: QC Required : Y  
 QL-A

More:

## Work Order Task Description:

SEE PAGE 2 FOR TASK DESCRIPTION.

More: Y

Planned By : MDFOW72 FOX *met* M D Date: 06/06/96  
 Pkg Appr By : MDFOW72 FOX M D Date: 06/06/96 Time: 08:31  
 QC Approval : DSM00PK MELODY D S Date: 06/06/96

## \*\*\*\*\* OPERATIONS APPROVAL TO START \*\*\*\*\*

\* NPS Start Permission: *[Signature]* LCO (Y/N): *Y*  
 \* Start Date/Time : *6/6/96 1 0645*  
 \*

NPS Completion Notif: *[Signature]* Major Failure: \_\_\_\_\_  
 Compl. Date/Time: *7-7-96 1 0645* Major Action: \_\_\_\_\_  
 Deficiency Tag Removed (Y/N): *NP*

KIKI3

Component: Sys: 26 Train:  
Associate: Assign Priority: A  
Name: T.S./RIS-26-31/32, CNTMT PART C Work Type: 7  
H.31/GAS CH.32 RATEMETERS (ACMP)  
Location: RAB/RAD MNTR PNL LMD: 2  
Defect/Request: T.S./RIS-26-31/32 CAL, CNTMT PART C  
H.31

Fac: PSL Unit: 01  
MASTER  
WORK ORDER TASK  
96014915 01  
ER/PWO: 63 / 5692  
Chg loc: 915  
PAGE 2 of 5

Continuation of Task Description:

\*\*\*\*\*  
\* NOTE: THIS 18 MONTH FREQUENCY CAL SATISFIES TECH SPEC 3.3.3.1.  
\*\*\*\*\*

\* NOTE: MONTHLY FUNCTIONAL CHECK OF RIS-26-31 & -32 IS NORMALLY PERFORMED EVERY THIRD MONDAY OF THE MONTH VIA PM1 2603 TO SATISFY TECH SPEC 3.3.3.1.

\* NOTE: IC 1-1400207, CAL OF CNTMT PROCESS MONITOR, HAS BEEN RETIRED & IS BEING REPLACED WITH NEW PROCEDURE 1-IMP-26.14.

1. COORDINATE AS NECESSARY WITH HP PERSONNEL (TO OBTAIN SOURCES...).

2. PERFORM CALIBRATIONS OF RIS-26-31 AND RIS-26-32 PER ~~1-IMP-26.14~~.

4. PMT: QI 11-4 APPENDIX D (FORM A.0.17 & B.0.17).

5. RLF: TEDB'S; 1-IMP-26.14; 8770-B-327 SH.449.

1-1400207

6-14-96  
RB 6-23-96



Component: Sys: 26 Train:  
Associate: Assign Priority: A  
Name: T.S./RIS-26-31/32, CNTMT PART Work Type: 7  
H.31/GAS CH.32 RATEMETERS (ACMP)  
Location: RAB/RAD MNTR PNL LMD: 2  
Defect/Request: T.S./RIS-26-31/32 CAL, CNTMT PART C  
H.31

Fac: PSL Unit: 01  
MASTER  
WORK ORDER TASK  
96014915 01  
ER/PWO: 63 / 5692  
Chg loc: 915  
PAGE 3 of 5

### JOURNEYMANS WORK REPORT

| Actual Start Date: | Time: | Actual Completion Date: | Time: |
|--------------------|-------|-------------------------|-------|
| 6/12/96            | 0049  | 7/2/96                  | 7:30  |

Note: Journeyman shall sign and date text after their entries.

#### Trouble Found:

This Section is NOT Applicable for PMS or other planned jobs

TEST EQUIP.

PSL 07/3  
PSL 456  
PSL  
PSL  
PSL

#### Work Performed:

STARTED CALIBRATION. NOTED high  
LEVEL OF BACKGROUND RADIATION. WILL HAVE HP ASSIST  
TO DETERMINE IF THIS LEVEL IS CORRECT. HAD TO  
ABORT CAL UPON THE REQUEST OF OPERATIONS.  
E. J. [Signature]  
6/14/96

Continued on Additional Sheets: ☒ N  
Suggestions For Future Planning/Variance Reason:

| Supv/Foreman/Chief | Date | Supervisor | Date | QC Inspector | Date |
|--------------------|------|------------|------|--------------|------|
|--------------------|------|------------|------|--------------|------|

[Signature]  
None - 7-4-96

Component: Sys: 26 Train:  
Associate: Assign Priority: A  
Name: T.S./RIS-26-31/32, CNTMT PART C Work Type: 7  
H.31/GAS CH.32 RATEMETERS (ACMP)  
Location: RAB/RAD MNTR PNL LMD: 2  
Defect/Request: T.S./RIS-26-31/32 CAL, CNTMT PART C  
H.31

Pac: PSL Unit: 01  
MASTER  
WORK ORDER TASK  
96014915 01  
ER/PWO: 63 / 5692  
Chg loc: 315  
PAGE 4 of 5

Continuation of Trouble Found/Work Performed:

Unable to cal RIS-26-31 will use PWO  
5768/63 to troubleshoot/repair/replace RIS 26-31.

C. J. A. 4/19/96

Performed functional on RIS 26-32. No  
Problems Found

C. J. A. 4/23/96

Started Func Cal on RIS-26-31 AFTER  
IT WAS Replaced under PWO 5768/63. Unable to  
Finish cal by end of shift.

C. J. A. 7/1/96

Completed Cal & Alarm Settings on  
RIS-26-31 & 32

C. J. A. 7/2/96

Continued on Additional Sheets: Y (N)