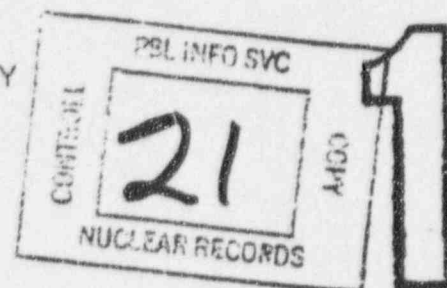


FLORIDA POWER & LIGHT COMPANY
ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1220055
REVISION 1

1.0 TITLE:

CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group _____ August 24, 1989

Approved by G. J. Boissy _____ Plant General Manager September 21, 1989

Revision 1 Reviewed by F R G _____ 02/25 1993

Approved by G. J. Boissy _____ Plant General Manager 03/08 1993

3.0 PURPOSE:

3.1 The purpose of this procedure is to delineate the instructions for calibration of the ARMS.

3.2 This procedure satisfies the surveillance requirements in table 4.3-3 of the Unit #1 Tech. Specs.

4.0 PRECAUTIONS & LIMITS:

4.1 Precautions on CIS Channels 3, 4, 5, and 6

1. Do not attempt calibration if any of the (-) CIS channels are in the alarm condition.
2. Work on CIS channels shall not be performed without notification of the NPS/ANPS.

FOR INFORMATION ONLY
THIS DOCUMENT IS NOT CONTROLLED. IF YOU USE
THIS DOCUMENT, YOU MUST OBTAIN THE DOCUMENT
FROM THE SOURCE AND NOT TO
REPRODUCE OR TRANSMIT IT
DATE 4/3/93 BY [Signature]

S 1 OPS	
DATE	_____
DOCT PROCEDURE	_____
DOCN	1-1220055
SYS	_____
COMP COMPLETED	_____
ITM	1

```
Component: _____ Sys: _____ Train: _____
Associate: _____ Assign Priority: E2
Name: ARMS / CIS / RECORDER CALS Work Typ: 6
```

Location: CONTROL RM. 62' / 30' EL. W/O LMD: 2
Defect/Request: 012FYP8084 IC 1-1220055 Tsk LMD: 2
NIT. CIS RAD MO

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK

93006899 01

ER/PWO 63 / 8084
LOCATION: 915
PAGE 3 of

JOURNEYMANS WORK REPORT

Work/Repairs Performed (cont.): _____

Continued on Additional Sheets: Y N

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1220055, REVISION 1
CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

4.0 PRECAUTIONS & LIMITS: (continued)

4.1 (continued)

3. Calibrate only one channel at a time. If a channel is inoperable, do not attempt to calibrate any channel until the inoperable channel is repaired and functioning.
4. Prior to calibrating a CIS ARM's channel, bypass the Containment Evacuation Alarm and appropriate ESFAS Containment Isolation Signal high radiation channel.

NOTE

If during the calibration, any of the remaining channels alarm, remove Containment Evacuation Alarm bypass key.

5. Reset all alarms and channel trips actuated during the calibration and remove the containment evacuation alarm bypass key after calibration is complete.
- 4.2 Inform all personnel by announcement over the plant page system of any alarms caused by calibration of the ARMS.
 - 4.3 The calibrator shall be used only under the direct supervision of Health Physics.
 - 4.4 The four (4) CIS and Fuel Pool area monitors are to be calibrated at each refueling and not to exceed 18 months.
 - 4.5 Channel calibration may be reverified by use of the Victoreen Field calibrator (results must agree $\pm 20\%$ or calibration is required). See Section 8.1 of this procedure.
 - 4.6 Any operation which moves the GM detector tube in the remote detector shall require a recalibration of the unit. See Section 8.2 of this procedure.
 - 4.7 Chart Print Recorders shall be in calibration before individual channel calibration or calibration verification is performed.
 - 4.8 This procedure requires the assistance of a H.P. Technician for the operation of radioactive calibration sources.

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

5.0 RELATED SYSTEM STATUS:

5.1 See 4.1 for CIS Channels 3, 4, 5, and 6.

6.0 REFERENCES:

6.1 FUSAR, Chapter 12

6.2 Victoreen Technical Manual 8770-8386

6.3 Operation of the ARMS, Operating Procedure 1120020

6.4 St. Lucie Unit 1 Technical Specifications

6.5 Area Radiation Monitoring System Preoperational Test

7.0 RECORDS REQUIRED:

7.1 An approved & completed 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 Normal I&C handtools

8.2 ARMS Alarm Test Box

/R1

8.3 Readout Module Support Stand

/R1

ST. LUCIE UNIT 1
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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

1

9.0 DETAILED PROCEDURE:

9.1 Verification of Detector Calibration

1. The steps that follow in this section are used to verify that a detector is in calibration.

NOTE

When a readout module or a detector is replaced, a complete detector calibration will be required using the MSGC 1000 per Section 9.2.

2. Place the "POS-IND" switch, on the recorder, to the "IND" position when the point which corresponds to the detector channel under calibration appears.
3. Lift the signal input lead to the readout module and verify that the "Fail Alarm" light on the module is extinguished and that the "Radiation Monitoring Failure" annunciator Q-36 (RTGB-106) alarms. Verify on Data Sheet 9.1. Reland the lifted signal lead.
4. Place the detector in the field calibrator and expose it to low radiation exposure.

CAUTION

Read Precautions for CIS channels 3, 4, 5, and 6, Section 4.1.

5. Record the value as read from the proper recorder on Data Sheet 9.1.
6. Repeat steps 9.1.4 and 9.1.5 for medium and high radiation exposure.
7. Obtain the decay corrected values for the field calibrator from H.P.. Record these values under the "Current Field Calibrator Radiation Values" column on Step 9.1.7 of Data Sheet 9.1.
8. Compare the values read on Step 9.1.5 and 9.1.6 to those obtained in Step 9.1.7. If the values differ by more than $\pm 20\%$, the detector must be recalibrated using Section 9.2 of this procedure.
9. Remove the detector from the field calibrator and install it in its proper location. Then proceed to Section 9.3, "Alarm Calibrations."

/R1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

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9.0 INSTRUCTIONS: (continued)

9.2 New Detector or New Readout Module Calibration

1. On the readout module to be calibrated, turn the function switch to the OFF position.
2. Remove the detector and connect it to the test cable located by the MSGC 1000, located in the H.P. cage in the electrical penetration room in the RAB.
3. Connect the other end of the test cable, located in the Control Room, in the rear of the ARMS cabinet C, to the proper terminals on the readout module terminal board.

Performed by N/A Date / / Independent Verification by N/A Date / /

4. Have H.P. place the detector to be calibrated in the MSGC 1000.
5. Place the "POS-IND" switch on the proper recorder to the "IND" position when the point which corresponds to the detector under calibration appears.
6. Turn the function switch to OPERATE position.

CAUTION

Read Precautions for CIS channels 3, 4, 5, and 6, Section 4.1.

/R1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

9.0 DETAILED PROCEDURE: (continued)

9.2 (continued)

NOTE

Perform step 7 if range is 0.1 to 10^4 mR/hr (medium range).
Perform step 8 if range is 1.0 to 10^5 mR/hr (high range).

7. Calibration of Medium Range Channels (857-2 Detector)

NOTE

Carefully extend the readout module on to support stand to provide access to adjustments.

- A. Record low, medium, and high range readings on Data Sheet 9.2 before making any adjustments.
- B. Expose detector to approximately 10^3 mR/hr and adjust R-21 so that recorder indicates input dose rate.
- C. Expose detector to approximately 10^1 mR/hr and adjust R-12 so that the recorder indicates input dose rate.
- D. Expose detector to approximately 10^3 mR/hr and adjust R-21 so that the recorder indicates input dose rate.
- E. Expose detector to approximately 10^4 mR/hr and adjust C-23 so that the recorder indicates input dose rate.
- F. Repeat steps 9.2.7.B through 9.2.7.E until recorder indications are within $\pm 20\%$ of applied exposures. Record these three recorder indications on Data Sheet 9.2. (after values)
- G. Expose the detector to a radiation intensity exceeding 10^4 mR/hr and verify that detector does not saturate. Verify on Data Sheet 9.2.
- H. Proceed to Step 9.2.9.

/R1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

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9.0 DETAILED PROCEDURE: (continued)

9.2 (continued)

8. Calibration of High Range Channels (857-3 Detector). See precautions for CIS Channels 3, 4, 5, and 6, Section 4.1.

A. To calibrate the output of the readout module to the recorder, perform the following:

1. Lift the input signal lead to the readout module and insert a DC voltage at the DC AMP OUTPUT test point TP1 by using the supplied ARMS Test Box to indicate full scale on the module's meter.
2. Verify the recorder's reading matches the readout module's meter and adjust R63 if necessary.
3. Remove the ARMS Test Box and reland the lifted signal input lead.
4. Leads relanded verified by:

Channel MA RM

Channel MB RM

Channel MC RM

Channel MD RM

NOTE

Carefully extend the readout module on top of the support stand to provide access to adjustments.

- B. Record low, medium and high range readings on Data Sheet 9.2 before making any adjustments.
- C. Expose detector to approximately 10^4 mR/hr and adjust R-21 so that the recorder indicates input dose rate.

/R1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

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9.0 DETAILED PROCEDURE: (continued)

9.2 (continued)

8. (continued)

- D. Expose detector to approximately 10^2 mR/hr and adjust R-12 so that the recorder indicates input dose rate.
 - E. Expose detector to approximately 10^4 mR/hr and adjust R-21 so that the recorder indicates input dose rate.
 - F. Expose detector to approximately 10^5 mR/hr and adjust C-23 so that the recorder indicates input dose rate.
 - G. Repeat steps 9.2.8.C through 9.2.8.F until recorder indications are within $\pm 20\%$ of applied exposures. Record these three recorder indications on Data Sheet 9.2. (after values)
 - F. Expose the detector to a radiation intensity exceeding 10^5 mR/hr and verify that detector does not saturate. Verify on Data Sheet 9.2.
 - 9. Remove detector from MSGC 1000 and place it into the field calibrator. Expose the detector to the low, medium, and high positions and record on Data Sheet 9.2.
 - 10. Remove detector from field calibrator and remove the test cable from the detector.
 - 11. Verify that the "Fail Alarm" light on the machine is extinguished and that the "Radiation Monitoring Failure" annunciator Q-36 (RTGB-106) alarms. Verify on Data Sheet 9.2.
 - 12. Remove test cable and reland the leads lifted in step 9.2.3. Refer to the latest revision CWD for verification of terminations.
- Performed by N/A Date / /
- Independent Verification by N/A Date / /
- 13. Relocate detector to its proper field location and connect it to its cable.

/R1

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1220055, REVISION 1
CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

9.0 DETAILED PROCEDURE: (continued)

9.2 (continued)

14. Expose the detector to the low, medium, and high position and record these values on Data Sheet 9.2.
15. Compare the values obtained in Step 9.2.14 and 9.2.9. Acceptance criteria $\pm 20\%$ agreement.

NOTE

When using field calibrator in areas where background of greater than 5 mR/hr is encountered, this background must be subtracted from the readings obtained.

9.3 Alarm Calibration and Verification

1. Reset the "High" and "High High" alarm push buttons on the readout module.
2. Set the High alarm to the desired alarm setpoint per Appendix A by turning the Function switch in the ALARM position pressing the yellow pushbutton and adjusting the High alarm setpoint pot R-37 (located on board mounted vertically on the left side of the readout module) to the desired reading on the proper recorder. Record this value on applicable Data Sheet 9.1 or 9.2.
3. Set the High High alarm to the desired alarm setpoint per Appendix A by turning the Function switch in the ALARM position pressing the red pushbutton and adjusting the High High alarm setpoint pot R-37 (located on the left side of the readout module next to R-21) to the desired reading on the proper recorder. Record this value on applicable Data Sheet 9.1 or 9.2.
4. Connect the ARMS alarm test box to the DC AMP OUTPUT test point, located inside the readout module and to ground and verify adjustment is fully counter-clockwise and test box is ON.

CAUTION

Read Precautions for CIS channels 3, 4, 5, and 6, Section 4.1.

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

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9.0 DETAILED PROCEDURE: (continued)

9.3 (continued)

5. Turn the function switch to operate position.
6. Turn the ARMS alarm test box adjustment slowly clockwise until the High alarm is actuated. Record the value indicated on the proper recorder on applicable Data Sheet 9.1 or 9.2.
7. Continue turning the adjustment until the High High alarm is actuated. Record the value indicated on the proper recorder on applicable Data Sheet 9.1 or 9.2.
8. Turn off the ARMS alarm test box switch and disconnect the test box.
9. Compare the values recorded on steps 9.3.2 and 9.3.6. Acceptance criteria $\pm 20\%$ agreement.
10. Compare the values recorded on Steps 9.3.3 and 9.3.7. Acceptance criteria $\pm 20\%$ agreement.
11. Place the "POS-IND" switch on the proper recorder to the "POS" position and clear all alarms on the readout module and ARMS cabinet. If an alarm calibration was performed on a CIS radiation monitor, the proper ESF trip must be reset.

Performed by Robert G. Beckman Date 5 / 4 / 93
I&C Technician

Reviewed by Frank J. Jenson Date 5 / 18 / 93
I&C Supervisor

/R1

1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.1
(Page 1 of 3)

By/Date	ARMS Channel No	Fail Alarm Verification Step 9.1.3. Verify leads are relayed	As Found Radiation Values Step 9.1.5 and 9.1.6			Field Calibrator Current Radiation Values Step 9.1.7			High Alarm As Set Step 9.3.2	High High Alarm As Set Step 9.3.3	High Alarm As Tested Step 9.3.6	High High Alarm As Tested Step 9.3.7
			Low	Med	High	Low	Med	High				
4/15/93 RJB	1	RJB	60	400	2.20	56.5	370.5	2.42	1 mR	10 mR	1 mR	10 mR
5/15/93 RJB	2	RJB	60	400	2.20				80 mR	150 mR	80 mR	150 mR
4/15/93 RJB	3	RJB	60	400	2.20				70 mR	80 mR	70 mR	80 mR
5/1/93 RJB	4	RJB	60	400	2.20				70 mR	80 mR	70 mR	80 mR
5/2/93 RJB	5	RJB	60	400	2.20				70 mR	80 mR	70 mR	80 mR
5/1/93 RJB	6	RJB	60	400	2.20				70 mR	80 mR	70 mR	80 mR
4/9/93 RJB	7	RJB	60	400	2.20				8 mR	15 mR	10 mR	15 mR
4/1/93 RJB	8	RJB	60	400	2.20				10 mR	15 mR	15 mR	30 mR
4/6/93 RJB	9	RJB	60	400	2.20				50 mR	80 mR	50 mR	80 mR
4/5/93 RJB	10	RJB	60	400	2.20				1.5 R	2.0 R	1.5 R	2.0 R
4/4/93 RJB	11	RJB	60	400	2.20				100 mR	300 mR	180 mR	350 mR
4/4/93 RJB	12	RJB	60	400	2.20				10 mR	20 mR	10 mR	20 mR
4/4/93 RJB	13	RJB	60	400	2.20				80 mR	110 mR	80 mR	125 mR
4/5/93 RJB	14	RJB	60	400	2.20				200 mR	2.0 R	200 mR	2.0 R

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.1
(Page 2 of 3)

By: / date	ARMS Channel No	Fail Alarm Verification Step 9.1.3	As Found Radiation Values Step 9.1.5 and 9.1.6			Field Calibrator Current Radiation Values Step 9.1.7			High Alarm As Set Step 9.3.2	High High Alarm As Set Step 9.3.3	High Alarm As Tested Step 9.3.6	High High Alarm As Tested Step 9.3.7
			Low	Med	High	Low	Med	High				
4/4/93 RJB	15	RJB	60	400	2.20	56.5	370.5	2.42	25mR	40mR	25mR	40mR
4/6/93 RJB	16	RJB	60	400	2.20				20mR	1.5R	20mR	600mR
4/6/93 RJB	17	RJB	60	400	2.20				30mR	100mR	30mR	50mR
5/12/93 RJB	18	RJB	60	400	2.20				60mR	105mR	65mR	80mR
4/6/93 RJB	19	RJB	60	400	2.20				50mR	200mR	50mR	80mR
4/7/93 RJB	20	RJB	60	400	2.20				65mR	120mR	65mR	120mR
4/8/93 RJB	21	RJB	60	400	2.20				60mR	90mR	60mR	90mR
4/6/93 RJB	22	RJB	55	400	2.20				50mR	200mR	50mR	180mR
4/6/93 RJB	23	RJB	60	400	2.20				100mR	1.5R	110mR	1.5R
	24 *											
4/3/93 RJB	25	RJB	60	400	2.20				200mR	1.1R	200mR	500mR
5/2/93 RJB	26	RJB	60	400	2.20				40mR	80mR	40mR	80mR
4/7/93 RJB	27	RJB	60	400	2.20				60mR	100mR	60mR	100mR
4/9/93 RJB	36	RJB	60	350	2.50				400mR	1.0R	400mR	1.0R

* Channel 24 to be calibrated under PWO # 0476/63.

ST. LUCIE UNIT 1

CALIBRATION
(Page 3 of 3)[illegible]

ST. LUCIE UNIT 1
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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.2
(Sheet 1 of 6)

ARMS Channel No.	MSGC 1000 Radiation Values Step 9.2.7 or 9.3.7.F			Saturation Step 9.2.7.G or Step 9.2.8.H	Field Calibrator & Test Cable Step 9.2.9			Calibrator at Detectors Location Step 9.2.14		
	Low	Med	High		Low	Med	High	Low	Med	High
1	Before									
	After									
2	Before									
	After									
3	Before									
	After									
4	Before									
	After									
5	Before									
	After									
6	Before									
	After									
7	Before									
	After									
8	Before									
	After									
9	Before									
	After									
10	Before									
	After									

1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.2
(Sheet 2 of 6)

ARMS Channel No.	MSGC 1000 Radiation Values Step 9.2.7 or 9.3.7.F			Saturation Step 9.2.7.G or Step 9.2.8.H	Field Calibrator & Test Cable Step 9.2.9			Calibrator at Detectors Location Step 9.2.14		
	Low	Med	High		Low	Med	High	Low	Med	High
11	Before									
	After									
12	Before									
	After									
13	Before									
	After									
14	Before									
	After									
15	Before									
	After									
16	Before									
	After									
17	Before									
	After									
18	Before									
	After									
19	Before									
	After									
20	Before									
	After									

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.2
(Sheet 3 of 6)

1

ARMS Channel No.	MSGC 1000 Radiation Values Step 9.2.7 or 9.3.7.F			Saturation Step 9.2.7.G or Step 9.2.8.H	Field Calibrator & Test Cable Step 9.2.9			Calibrator at Detectors Location Step 9.2.14		
	Low	Med	High		Low	Med	High	Low	Med	High
21	Before									
	After									
22	Before									
	After									
23	Before									
	After									
24	Before									
	After									
25	Before									
	After									
26	Before									
	After									
27	Before									
	After									
36	Before									
	After									
37	Before									
	After									
38	Before									
	After									

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ARMS DETECTOR CALIBRATION DATA SHEET 9.2
(Sheet 4 of 6)

ARMS Channel No.	MSGC 1000 Radiation Values Step 9.2.7 or 9.3.7.F			Saturation Step 9.2.7.G or Step 9.2.8.H	Field Calibrator & Test Cable Step 9.2.9			Calibrator at Detectors Location Step 9.2.14		
	Low	Med	High		Low	Med	High	Low	Med	High
39	Before									
	After									
52	Before									
	After									
53	Before									
	After									
	Before									
	After									
	Before									
	After									
	Before									
	After									
	Before									
	After									
	Before									
	After									
	Before									
	After									
	Before									
	After									

1

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CALIBRATION OF AREA RADIATION MONITORING SYSTEM (ARMS)

ARMS DETECTOR CALIBRATION DATA SHEET 9.2
(Sheet 5 of 6)

ARMS Channel No.	Fail Alarm Verification Step 9.2.11	High Alarm As Set Step 9.3.2	High High Alarm As Set Step 9.3.3	High Alarm As Tested Step 9.3.6	High High Alarm As Tested Step 9.3.7	Initials/Date
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

1



FPL

1993 U1 Refueling Outage ARM's Values

A. MSG-C Values

1000A S/N: 111 Due: 6-23-93

Detector 857-2

	Source	Det. Level	Shelf Level	6-23-92 Dose Rate	3-30-93 Dose Rate
~ 10.0 mR/h	2	12"	9 1/2"	11.0	10.8 (8.6 - 13.0)
~ 1.0 R/h	3	3"	4 1/2"	1.08	1.06 (0.85 - 1.27)
~ 10.0 R/h	4	9"	6 1/2"	9.8	9.63 (7.70 - 11.56)

Detector 857-3

~ 100.0 mR/h	6	11"	8 1/2"	92.7 mR/hr	93.0 (74.4 - 111.6)
~ 10.0 R/h	4	9"	6 1/2"	9.8	9.63 (7.70 - 11.56)
~ 100.0 R/h	8	10"	7 1/2"	96.1	94.4 (75.5 - 113.3)

$$D = D_0 e^{-\lambda t}$$

$$= D_0 \times e^{\frac{-0.693(0.8 \text{ yr})}{30.17 \text{ yr}}} = D_0 \times 0.98$$

$$\Delta t = 6-23-92 \text{ to } 3-30-93 = 9 \text{ m } 1 \text{ wk} = 0.8 \text{ yr}$$

BY _____ DATE _____
 CHKD. BY _____ DATE _____



SHEET NO. _____ of _____
 PROJECT NO. _____

FIELD CALIBRATOR Model 848-8 S/N: 180

Date: 8-23-91

Decayed To: 3-30-93 $\pm 20\%$

Closed: 58.6 mR/h

56.5 45.2 - 67

Intermediate: 384.4 mR/h

370.5 296.4 - 444

Open: 2510 mR/h

2419. 1935 - 2903

$$D = D_0 e^{-\lambda t}$$

$$D_0 = \frac{D}{e^{-\lambda t}} = \frac{370.5}{e^{-0.693(1.6y)}} = D_0 * 0.9638$$

$$\Delta t = 1y 7m 1w$$

$$= 1.60 y$$

$$\frac{370.5 \text{ mR}}{hr} \times \frac{1 \text{ hr}}{60 \text{ m}} = 6.18 \text{ mR/m} \times \frac{1 \text{ K}}{1000 \text{ mR}} = 0.00618 \text{ K/m}$$

OUTAGE

101 #1

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL ROO Work Type: 5
M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Defect/Request: ALARMING FREQUENTLY (TWICE EACH SHI
FT)

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK
96013310 01
ER/PWO: 63 / 5615
Chg Loc: 915
PAGE 1 of 4

Detailed Explanation:

EITHER THE RAD MONITOR IS FAILING OR ACTUAL RAD LEVELS ARE
SHOWING SPORADIC INCREASES.

Work Request: 96009217 Def Tag: C77063 Loc: CR RAD PANEL More:
Trbl/Brkdown: Y LCO: N Unit Cond Req: 6
NPRDS: N Fail Date: Time: Det: Stat: Symp:
Originator: DMC0JGI HOLZMACHER Date: 05/24/96 Dept: OPS
Approve By: AMT0QPK TEREZAKIS A M Date: 05/24/96

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	: Y	Seismic Cat	: D	Est M/H	: 16.00
ASME XI (ISI) Req'd	: N	Scaffold Req	: N	Crew Qty	: 2
Security Clearance:	N	Fire Prot Req	: N	Insul Rem	: N
Clearance Required:		Clearance No	:		
RWP Required: N RWP No:		RCA M/H: L1:		L2:	L3:

QC Requirements: QC Required : Y
QL-A

More:

Work Order Task Description: Standard: ARMS T/R

SEE PAGE 2 FOR TASK DESCRIPTION.

More: Y

Planned By : DJGONGV GARRISON D J Date: 05/24/96
Pkg Appr By : DJGONGV GARRISON D J Date: 05/24/96 Time: 05:49
QC Approval : DAGOAKC GINGRAS D A Date: 05/24/96

OPERATIONS APPROVAL TO START

* NPS Start Permission: [Signature] LCO (Y/N): Y
* Start Date/Time : 05/24/96 1:00 PM

NPS Completion Notif: [Signature] Major Failure: _____
Compl. Date/Time: 5-30-96 Major Action: _____
Deficiency Tag Removed (Y/N): X

KK/29

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL ROO Work Type: 5
 M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Defect/Request: ALARMING FREQUENTLY (TWICE EACH SHI
 FT)

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK
96013310 01
ER/PWO: 63 / 5615
Chg loc: 915
PAGE 2 of 4

Continuation of Task Description:

1. COORDINATE ALL WORK WITH OPS, AND H.P.
2. INVESTIGATE REPORTED PROBLEM WITH RIS-26-1.
USE ADM 0010432 FIG.3/FIG.4, AND/OR AP 0010142, SENSITIVE SYSTEMS
AS REQUIRED WHEN LIFTING LEADS, USING JUMPERS OR PULLING FUSES.
3. MAKE REPAIRS/ADJUSTMENTS AS REQUIRED AND DOCUMENT THEM IN THE
JOURNEYMAN'S WORK REPORT. (REFERENCES: SEE TEDB SHEETS FOR CWD'S
AND TECH MANUAL).
4. IF NECESSARY, PERFORM FUNCTIONAL TESTS USING IC 1-1220055.
5. COORDINATE WITH H.P. FOR CALIBRATION.
6. PERFORM POST MAINTENANCE TESTING PER QI 11-4, APPENDIX D.

SYSTEM SUPERVISOR: FRANK GUSMANO

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL RO Work Type: 5
M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Defect/Request: ALARMING FREQUENTLY (TWICE EACH SHI
FT)

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK
96013310 01
ER/PWO: 63 / 5615
Chg loc: 915
PAGE 3 of 4

JOURNEYMANS WORK REPORT

Actual Start Date:	Time:	Actual Completion Date:	Time:
5/26/96	00:00	5/30/96	8:30

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.

917

No Malfunction Found

Work Performed:

Module shows an indication which
fluctuates between .5 to 8 HR. Alert alarm
is set @ 1HR. This could be the problem
1HR may be an unrealistic setting

CJS 5/26/96

Continued on Additional Sheets: (Y) N
Suggestions For Future Planning/Variance Reason:

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

J. J. Womam

6-10-96

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL ROO Work Type: 5
M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Defect/Request: ALARMING FREQUENTLY (TWICE EACH SHI
FT)

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK

96013310 01

ER/PWO: 63 / 5615
CLg loc: 915
PAGE 4 of 4

Continuation of Trouble Found/Work Performed:

Had HP check Control Room. They
found levels to be .002 to .003 MK. Their
equipment is much more accurate at low
levels. We will attempt to re-calibrate RIS
26-1

E. J. S.
5/25/55

Checked Calibration of Module and found
it to be well within tolerance. Adjusted
low end to favor the lower side of the
low limit. Module now reading between .2 to .3 MK.
This should eliminate nuisance alarm in Control
Room. Performed a complete check on Module
RIS 26-1 using Procedure IAC # 1-1220055. No
problems found.

E. J. S.
5/25/56

Continued on Additional Sheets: Y N

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL ROOM Work Type: 5
M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Effect/Request: ALARMING FREQUENTLY (TWICE EACH SHIFT)

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK
96013310 01
ER/PWO: 63 / 5615
Chg Loc:
Page: 1

ATTACHMENT A

TOTAL EQUIPMENT DATA BASE SHEET

Facility: PSL	Unit: 01	
Component: RIS-26-1		Associate:
Comp Type: IX		Comp Sub Type: M
Equipment Name: READOUT MODULE FOR (CONTROL ROOM AREA)		
System: RADIATION MONITORING		Code: 26
Location Desc:		
Location Code: RAB/RAD MNTR PNL		Startup Sys Code: 077
RWP Req'd: N	IST Req'd: N	EQ Req'd: N
NPRDS: N		Safety Class: QR
IS Major Code: LE56		Q-Basis:
IS Major Mfg'r: VCT		Q-Group: N/A
GEMS ID Code: 1		Q-Level:
IS Minor Code: 4234		SCEW: N/A
IS Minor Mfg'r: ZZZ		PCM:
Account Code: 532		SPEER: N/A
Equipment Mfg'r: VICTOREEN INSTRUMENTATION		Surv Maint Note: N/A
Model No: 856-2-M1		Doc Pac: N/A
Engr Data Ref:		Seismic Cat: D
Remarks: N/A		
EQ Comp Tag: N/A		EQ Rev: N/A

Purchase Order (s) :

422309

Drawing (s) :

770-B-327 440
770-5723

Tech Manual (s) :

770-5761 RADIATION MONITORING SYSTEM

Procedure (s) :

Note (s) :

LMD

Note (s) :

LMD

Unit	NPWO	5615	Work Order	96013310	Task
Component Tag Number	R15-26-1		Associated Component	System # 26	
Equipment Name/Component Description CONTROL ROOM AREA MONITOR					
Brief Repair Description: VERIFIED CALIBRATION					
Testing Required:					
<input checked="" type="checkbox"/> Notify H-P	Initial	Sat	Unsat		
<input type="checkbox"/> Channel Functional Test I&C					
<input checked="" type="checkbox"/> Calibration I&C					
<input checked="" type="checkbox"/> Channel Check					
<input type="checkbox"/> Verify Detector Voltage					
<input type="checkbox"/> Verify Conversion Factor					
<input type="checkbox"/> Acquire Source Decay Information					
<input type="checkbox"/> Verify proper operation of RM-23*					
<input type="checkbox"/>					
<input type="checkbox"/>					
<input type="checkbox"/>					
<input type="checkbox"/>					
<input type="checkbox"/>					
<input type="checkbox"/>					
Testing Unsat Comments:					
<input checked="" type="checkbox"/> PMT COMPLETE (NO DEFERRAL)					
MAINT. SUPV.:		Frank Jones		DATE: 5-30-96	
<input type="checkbox"/> PMT DEFERRED					
Lis. tests DEFERRED:					
BLANKET NPWO #:		BLANKET WO #:		DATE:	
MAINT. SUPV.:				DATE:	
DEFERRED TEST RESULTS ACCEPTED BY PMT COOR.:				DATE:	
IF ANY TEST IS UNSAT, NPWO #: WO # FOR REWORK					
EQUIPMENT RETURNED TO SERVICE					
NPS/ANPS/NWE:		DATE:		5-11-96	
COMMENTS:					

FOR INFORMATION ONLY
THIS DOCUMENT IS NOT CONTROLLED. DO NOT USE.
VERIFY INFORMATION WITH A CONTROLLED DOCUMENT
FLORIDA POWER AND LIGHT CO.
ST. LUCIE PLANT
DATE VERIFIED 5-25-96 INITIAL *FE*

/R29

Component: RIS-26-1 Sys: 26 Train:
Associate: Assign Priority: B2
Name: READOUT MODULE FOR (CONTROL ROOM Work Type:
M AREA)
Location: RAB/RAD MNTR PNL LMD: 2
Defect/Request: ALARMING FREQUENTLY (TWICE EACH SHI
FT)

Fac: PSL Unit: 01

WORK ORDER TASK

96013310 01

ER/PWO: 63 /
Chg Loc:
Page: 1

ATTACHMENT A

TOTAL EQUIPMENT DATA BASE SHEET

Facility: PSL	Unit: 01	
Component: RIS-26-1		Associate:
Comp Type: IX		Comp Sub Type: M
Equipment Name: READOUT MODULE FOR (CONTROL ROOM AREA)		
System: RADIATION MONITORING		Code: 26
Location Desc:		
Location Code: RAB/RAD MNTR PNL		Startup Sys Code: 077
RWP Reqd: N	IST Reqd: N	EQ Reqd: N
NPRDS: N		Safety Class: QR
EMS Major Code: LE56		Q-Basis:
EMS Major Mfgr: VCT		Q-Group: N/A
GEMS ID Code: 1		Q-Level:
EMS Minor Code: 4234		SCEW: N/A
EMS Minor Mfgr: ZZZ		PCM:
Account Code: 532		SPEER: N/A
Equipment Mfgr: VICTOREEN INSTRUMENTATION		Surv Maint Note: N/A
Model No: 856-2-M1		Doc Pac: N/A
Engr Data Ref:		Seismic Cat: D
Remarks: N/A		
EQ Comp Tag: N/A		EQ Rev: N/A

Purchase Order (s) :

NY-422309

Drawing (s) :

8770-B-327 440
8770-5723

Tech Manual (s) :

8770-6761 RADIATION MONITORING SYSTE

Procedure (s) :

Note (s) :

LMD

Note (s) :

LMD

Facility: PSL Unit: 01 LMD: 2
Component: RIS-26-1
Associate: _____

Date Printed: 05/24/96

Att: _____
Rev: _____
Page _____ of _____

TOTAL EQUIPMENT DATA BASE SHEET

EQ Tag: N/A

EQ Rev: N/A EQ Doc Pac: N/A

System: 26 RADIATION MONITORING

Seismic: D Safety Class: QR Eng Ref: _____

Q Group: N/A EQ Surv Note: N/A EQ Speer: N/A

RG197: Y

EQ Related: N EQ Scew: N/A

RG197 Cat: 3

Q Basis: _____ EQ Remarks: N/A

RG197 Type: E

Comp Type: IX Sub Type: M Safety Channel: NS Pcm: _____

Name: READOUT MODULE FOR (CONTROL ROOM AREA)

Locn Code: RAB/RAD MNTR PNL

Startup System: 077

Locn Desc: _____

Instl MFG #: VTC VICTOREEN INSTRUMENTATION

Engineering Verified: Y

Instl Model: 856-2-M1

Rev: 000 Orig Po: NY-422309

Comp Group: R-26-1;RR-26-1C

NPRDS: N

Acct No: 532

EQ Tab: _____ Insulation Rmvl: _____ Train: _____

Scaffold Req: _____ Critical Comp: _____ Control Room Comp: _____

Work Group: _____ IST Reqd: N RWP Reqd: N

Maint Pgms: _____

Facility: PSL Unit: 01 LMD: 2
Component: RIS-26-1
Associate: _____

Date Printed: 05/24/96

Att: _____
Rev: _____
Page _____ of _____

TOTAL EQUIPMENT DATA BASE SHEET

Drawing:
8770-B-327
8770-5723

Sheet: Coordinates
440 _____

Tech Manuals:
8770-6761

Procedures:

Notes:

Approved Alternate
Mfg: Description:

Model:

Rev. Instl. Eng Ver.

Parameter

Name:	Value:	UOM:
SENSING LINE QGROUP	_____	N/A
IMPULSE LINE NO	_____	N/A
TUBE TRACK NO	_____	N/A
RANGE DESCR #1	_____	N/A
PROCESS RANGE #1	_____	N/A
SENSING LINE QGROUP	N/A	N/A
IMPULSE LINE NO	N/A	N/A
TUBE TRACK NO	N/A	N/A
PROCESS RANGE #1	1E-1 TO 1E4	N/A
PROCESS UNITS #1	MR/HR	N/A
SIGNAL INPUT #1	_____	N/A
INPUT UNITS #1	_____	N/A
SIGNAL OUTPUT #1	_____	N/A
OUTPUT UNITS #1	_____	N/A
SCALE RANGE #1	1E-1 TO 1E4	N/A
SCALE UNITS #1	MR/HR	N/A

REVISION NO.: 2	PROCEDURE TITLE: CONTROL OF PLANT WORK ORDERS	PAGE: 80 of 82
PROCEDURE NO.: ADM-0010432	ADMINISTRATIVE PROCEDURE ST. LUCIE PLANT	

FIGURE 3
TROUBLESHOOTING/MAINTENANCE NPWO PRE-JOB REVIEW SHEET

TROUBLESHOOTING/MAINTENANCE NPWO PRE-JOB REVIEW SHEET

NPWO No. 5765 ER 43 NPS/ANPS Unit 1

A. The Equipment has been declared OOS or is not being relied upon to perform its intended function? Yes ☐ No ☒

B. Are the affects confined to the subject Equipment? Yes ☒ No ☐

If A and B are Yes 10CFR50.59 screening is not required. Continue Work: Yes ☐ No ☐

Performed By: [Signature] Date: 5/26/96

Reason for Disapproval: 5765 screening not required

Qualified Reviewer

10 CFR 50.59 Screening Questions:

- A. Does this alteration represent a change to the facility as described in the SAR? (Includes connection of DAS to redundant safety channels) Yes ☐ No ☒
- B. Does this alteration represent a change to procedures described in the SAR? Yes ☐ No ☒
- C. Is the alteration associated with the test or experiment not described in the SAR? Yes ☐ No ☒
- D. Could the alteration affect nuclear safety in a way not previously evaluated in the SAR? Yes ☐ No ☒
- E. Does implementation of this alteration require a change to the Technical Specifications? Yes ☐ No ☒

FSAR Sections reviewed: All NWS Applicable

T.S. Sections Reviewed: All NWS Applicable

Screening Results:

If the answer to any of the screening questions is yes, a 10CFR50.59 Safety Evaluation is required.

- A. Is 10CFR50.59 Safety Evaluation required? Yes ☐ No ☒
- B. If Yes, have Engineering perform the evaluation and submit the NPWO, with a copy of the evaluation, for FRG review.

Performed By: [Signature] Date: 5/26/96

FRG

FRG Review No. _____ Date _____

PGM Approval or Designee: _____ Date _____

FOR INFORMATION ONLY

THIS DOCUMENT IS NOT FOR DISTRIBUTION OUTSIDE THE PLANT.
VERIFY INFORMATION WITH A CONTROL UNIT REPRESENTATIVE.

ST. LUCIE PLANT
5/26/96

[Signature]

TO: Frank Gusmano
FROM: Linda E. Pugh

DATE:

13-Sep-94

SUBJECT: Source HP-31 Victoreen Field Calibrator Dose Rate Values

Per the attached 'Data Analysis Sheet' from Victoreen, the following are the decay corrected values to use:

DATE	CLOSED	INTERMEDIATE	OPEN
8/23/91	58.6	384.4	2510
9/1/94	54.7	358.6	2341
9/15/94	54.6	358.3	2339
9/29/94	54.6	358.0	2337
10/13/94	54.5	357.6	2335
10/27/94	54.5	357.3	2333
11/10/94	54.4	357.0	2331
11/24/94	54.4	356.7	2329
12/8/94	54.3	356.4	2327
12/22/94	54.3	356.1	2325
1/5/95	54.2	355.8	2323
1/19/95	54.2	355.5	2321
2/2/95	54.1	355.1	2319
2/16/95	54.1	354.8	2317
3/2/95	54.0	354.5	2315
3/16/95	54.0	354.2	2313
3/30/95	53.9	353.9	2311
4/13/95	53.9	353.6	2309
4/27/95	53.9	353.3	2307
5/11/95	53.8	353.0	2305
5/25/95	53.8	352.6	2303
6/8/95	53.7	352.3	2301
6/22/95	53.7	352.0	2299
7/6/95	53.6	351.7	2297
7/20/95	53.6	351.4	2295
8/3/95	53.5	351.1	2293
8/17/95	53.5	350.8	2291
8/31/95	53.4	350.5	2289

DATE :	① CLOSED			② INTERMID.			③ OPEN		
	MIN	OPTIMUM	MAX	MIN	OPTIMUM	MAX	MIN	OPTIMUM	MAX
9/14/95		53.4			350.2			2286	
9/28/95		53.3			349.9			2284	
10/12/95		53.3			349.6			2282	
10/26/95		53.2			349.2			2280	
11/9/95		53.2			348.9			2278	
11/23/95		53.1			348.6			2276	
12/7/95		53.1			348.3			2274	
12/21/95		53.1			348.0			2272	
1/4/96		53.0			347.7			2270	
1/18/96		53.0			347.4			2268	
2/1/96		52.9			347.1			2266	
2/15/96		52.9			346.8			2264	
2/29/96		52.8			346.5			2262	
3/14/96		52.8			346.2			2260	
3/28/96		52.7			345.9			2258	
4/11/96		52.7			345.6			2256	
4/25/96		52.6			345.3			2255	
5/9/96		52.6			345.0			2253	
5/23/96	42	52.5	63	275.8	344.7	413.6	1801	2251	2701
6/6/96		52.5			344.4			2249	
6/20/96		52.5			344.1			2247	
7/4/96		52.4			343.8			2246	
7/18/96		52.4			343.5			2243	
8/1/96		52.3			343.2			2241	
8/15/96		52.3			342.8			2239	
8/29/96		52.2			342.5			2237	
9/12/96		52.2			342.2			2235	
9/26/96		52.1			341.9			2233	
10/10/96		52.1			341.6			2231	
10/24/96		52.0			341.3			2229	
11/7/96		52.0			341.0			2227	
11/21/96		51.9			340.7			2225	
12/5/96		51.9			340.4			2223	
12/19/96		51.9			340.1			2221	
1/2/97		51.8			339.8			2219	
1/16/97		51.8			339.5			2217	
1/30/97		51.7			339.2			2215	
2/13/97		51.7			338.9			2213	
2/27/97		51.6			338.6			2211	
3/13/97		51.6			338.4			2209	