VOL. 8

FNP-1-IMP-201.22
June 17, 1978
Revision 2

FARLEY NUCLEAR PLANT

INSTRUMENT MAINTENANCE PROCEDURE

FNP-1-IMP-201.22

PRESSURIZER LEVEL CONTROL, LC-459F

Approved:

I&C Supervisor

Date Issued: 12/6/78

Diskette #IMP-8

B1.1I

PROCEDURE REQUEST FORM FNP-0-AP-1

1. Procedure Number FNP-I-IMP-2013 Revision Number 2
   Procedure Title Pressurizer Level CONTROL LC-459F

- ☐ Safety Related
- ☑ Non-Safety Related
- ☐ New Procedure Request
- ☐ Procedure Revision, New Revision Number _____
- ☐ Change of Intent
- ☑ Temporary Procedure Change, Effective until next permanent change, TCN 2A
- ☐ One time Temporary Procedure Change, Effective from _____ to _____, TCN _____

2. Change Summary

2.1 Procedure Page Numbers Affected by Change
Page 6 DATA Sheet # 3

2.2 Description of Changes
CHANGE UNITS Vdc Required To 1.0, 2.0, 3.0 + 4.0 + 5.0 Vdc

2.3 Reason for Change
NCO card 4-20 mAdc CURRENT OUTPUT MONITORED ACROSS 250 Ω RESISTOR

3. Prepared By Billy W. Hamm (Signature), I&M (Title), 3-19-79 (Date)

4. Reviewed By R.2. Prater (Signature), I&C FOREMAN (Title), 3-19-79 (Date)

5. Cross-Disciplinary/PORC Review

Group	Signature	Title	Date

6. Temporary Change Approval (Signature/Date)

- ☒ Member Group Staff — R.2. Prater / 3-19-79
- ☐ Shift Foreman — _____ / _____
- ☐ Senior Reactor Operator — _____ / _____

7. Final Approval (Signature/Date, required within 30 days of temporary approval)

- ☑ Group Supervisor — [signature] 4/6/79
- ☐ Plant Superintendent — _____ / _____
- ☐ Manager of Operations QA — _____ / _____
- ☐ Manager of Nuclear Generation — _____ / _____
- ☐ Plant Manager — _____ / _____

TCA1 2.A

		SELECTOR: ECY-459F			LOCATION: C8-124		MONITOR:			LOCATION:	
UNITS	UNITS VDC	UNITS VDC	HIGH TOLERANCE +0.01	LOW TOLERANCE -0.01	TYPE: NCD		UNITS	HIGH TOLERANCE	LOW TOLERANCE	TYPE:	
					STYLE: 283BA16G03					STYLE:	
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
	0.0	1.00									
	2.5	2.00									
	5.0	3.00									
	7.5	4.00									
	10.0	5.00									
	7.5	4.00									
	5.0	3.00									
	2.5	2.00									
	0.0	1.00									

SPECIAL CHECKS/REMARKS

Verified: Section Initials

SPECIAL CHECKS/REMARKS

Verified: Section Initials

PROCEDURE REQUEST FORM FNP-0-AP-1

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Procedure Title Pressurizer Level Control LC-459F

- ☐ Safety Related
- ☑ Non-Safety Related
- ☐ New Procedure Request
- ☐ Procedure Revision, New Revision Number _____
- ☐ Change of Intent
- ☑ Temporary Procedure Change, Effective until next permanent change, TCN 2B
- ☐ One time Temporary Procedure Change, Effective from _____ to _____, TCN _____

2. Change Summary

2.1 Procedure Page Numbers Affected by Change
DATA Sheet # 7

2.2 Description of Changes
CHANGE CARD LOCATION TO C5-329

2.3 Reason for Change
Typing Error

3. Prepared By B Lloyd Hamm (Signature), ISM (Title), 3-19-79 (Date)

4. Reviewed By Nolan Dyke (Signature), I&C Foreman (Title), 3-19-79 (Date)

5. Cross-Disciplinary/PORC Review

Group	Signature	Title	Date

6. Temporary Change Approval (Signature/Date)

- ☑ Member Group Staff — Nolan Dyke / 3-19-79
- ☐ Shift Foreman — _____ / _____
- ☐ Senior Reactor Operator — _____ / _____

7. Final Approval (Signature/Date, required within 30 days of temporary approval)

- ☑ Group Supervisor — B Lloyd Hamm 4/6/79
- ☐ Plant Superintendent — _____ / _____
- ☐ Manager of Operations QA — _____ / _____
- ☐ Manager of Nuclear Generation — _____ / _____
- ☐ Plant Manager — _____ / _____

TCN 2B

UNITS	UNITS	MONITOR: LR-460C (Output 1) UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE -0.025	LOCATION: C5-329 TYPE: NAL STYLE: 2837A13G02	
RANGE	VARIABLE	REQUIRES	AS FOUND	ERROR	FINAL	ERROR
		TRIP				
		7.000				
		RESET				
		6.900				

MONITOR: LR-460C (Output 2) UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE -0.025	LOCATION: C5-329 TYPE: NAL STYLE: 2837A13G02	
REQUIRED	AS FOUND	ERROR	FINAL	ERROR
TRIP				
1.500				
RESET				
1.600				

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/460A(Ann. H11) 7.15

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/460 (Ann. H03) 7.16

PAGE NO.	REVISION NO. 2										
	0	1	2	3	4	5	6	7	8	9	10
1	X	X	X								
2	X										
3	X		X								
4	X										
5	X	X									
6	X	X	X								
7	X	X	X								
8	X		X								
9	X		X								
10	X		X								
11	X		X								
12	X		X								
13	X		X								
Fig. 1	X	x	x								
Fig. 2	X	x	x								
DATA PACKAGE IMP-201.22A											
1	X		X								
2	X		X								
3	X										
4	X		X								
5	X	X	X								
6	X		X								

PAGE NO.	REVISION NO. 2										
	0	1	2	3	4	5	6	7	8	9	10
7	X		X								
8	X		X								
9	X		X								

1.1 The purpose of this procedure is to verify and, if required, re-establish the accuracies and control functions of the channel sensor and associated signal processing equipment.

1.2 This procedure is written for normal complete calibration; however, partial performance is also possible. Partial performance is divided into: 1) signal processing equipment excluding the controller drivers, sections 2.0 through 7.17, excluding sections 7.5 and 7.6 or 2) the controller drivers only, section 2.0 through 7.1, 7.5, 7.6 and 7.17.

2.0 Acceptance Criteria

2.1 The acceptance criteria for this test is that the process instrumentation provide intolerance conversion of the process parameter and perform its as-designed indication and control functions. The setpoints and tolerances to be used are contained in the data package listed as reference 3.1.

3.0 References

3.1 FNP-1-IMP-201.22A, Instrument Maintenance Procedure Data Package - Pressurizer Level Control, LC-459F.

3.2 U-176044, Westinghouse Schematic 7378D53.

3.3 U-176000, Westinghouse Schematic 7377D94.

3.4 U-215587, Instruction Book for Process Instrumentation and Control.

3.5 D-177179, Elementary Diagram Pressurizer Pressure and Level.

3.6 U-260860, P2500 Computer Operator Guide.

3.7 D-181709, Connection Diagram, Aux Relax Rack 1.

FARLEY NUCLEAR PLANT
UNIT 1
INSTRUMENT MAINTENANCE PROCEDURE IMP-201.22
PRESSURIZER LEVEL CONTROL, LC-459F

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3.7 D-181709, Connection Diagram, Aux Relax Rack 1.

4.0 Test Equipment

4.1 Fluke Digital Multimeter, Model 8120A or equivalent (2).

4.2 7300 series card extender (3).

4.3 Hewlett Packard Dual D.C. Power Supply Model 6228B or equivalent.

4.4 Process Control "Controller/Driver" Test Assembly.

4.5 7300 Series Card Tester.

5.0 Precautions and Limitations

5.1 All reference to data sheets by this procedure is to data sheets contained in reference 3.1. All reference to attachments are to the attachments of FNP-0-IMP-443.1.

5.2 Critical procedure sections and steps are listed on page 2 of the data package used with this procedure and are marked with an asterisk (*) within the body of this procedure. As each critical step or section is completed, initial on the space provided on Table 1 of the data package.

5.3 Observe all precautions and limitations listed in FNP-0-IMP-0, General Instrumentation and Controls Precautions and Limitations.

5.4 During the conduct of this test, the following items will be erratic and unreliable.

5.4.1 LR-459 (Pen 1)

5.4.2 LR-459 (Pen 2)

5.4.3 AP L0483A

5.4.4 Annunciator H02, PRESSURIZER LEVEL DEVIATION HI BACKUP HEATERS ON.

5.4.5 Annunciator H03, PRESSURIZER LEVEL LO BACKUP HEATERS OFF AND LTDN SECURED.

5.4.6 Annunciator H11, PRESSURIZER WATER LEVEL HI.

5.4.7 Annunciator H12, PRESSURIZER LEVEL DEVIATION LO.

5.5 During the conduct of this test Automatic Control of LC-459F will be inoperable. M/A station FK-122 must remain in MANUAL for the duration of this test.

5.6 During the conduct of this test the Low Level Interlock for the following valves will be disabled:

5.6.1 1-CVC-HV-8149A.

5.6.2 1-CVC-HV-8149B.

5.6.3 1-CVC-HV-8149C.

5.6.4 1-CVC-LCV-459.

5.6.5 1-CVC-LCV-460.

5.7 During the conduct of this test the automatic operation of Pressurizer Heaters will be erratic. Pressurizer heater bank 1A, 1B, 1C, 1D and 1E control switches should be kept in the OFF position throughout this test.

*6.0 Initial Conditions

6.1 The plant is in mode 5 or 6.

6.2 Pressurizer heater groups 1A, 1B, 1C, 1D and 1E are in OFF.

6.3 Charging flow control valve 1-CVC-FCV-122 is in MANUAL control. (M/A station FK-122 is MANUAL).

6.4 Computer AP L0483A is removed from SCAN and LIMIT CHECK.

6.5 The Shift Foreman has granted administrative authority to perform this test and is aware of indications, printouts and alarms that will result.

7.0 Detailed Procedure

*7.1 Place the channel in test mode as f llows:

7.1.1 Jumper the following terminals in Auxiliary Relay Rack 1:

7.1.1.1 TB115-9 to TB116-1

Rev. 0

7.1.1.2 TB116-2 to TB116-6

7.1.1.3 TB116-7 to TB116-11

7.1.1.4 TB104-8 to TB115-2

7.1.1.5 TB104-4 to TB117-6

*7.2 Functional Test of Relay (NRC) Card, LY/459Y-459Z Style 2837A87G04, Location C8-122.

*7.2.1 Remove the Relay card from location C8-122.

7.2.2 Place the card in the 7300 series card tester.

7.2.3 Test the card in accordance with the instruction given in reference 3.3 and indicate results on data sheet 1.

NOTE: Do not reinstall the NRC card.

*7.3 Recorder Calibration, Number LR-459 pen 1, Location MCB

7.3.1 Insert an extender card in location C8-122 (card LY/459Y-459Z is removed).

7.3.2 Connect the DC power supply and a DVM to pins 36(+) and 39(-) of the extender card.

7.3.3 Apply the inputs called for on data sheet 1 by adjusting the DC power supply and reading the DVM connected to the extender card.

7.3.4 If required, adjust the recorder as instructed in Attachment A17.

7.3.5 Record FINAL data.

7.3.6 Disconnect the test equipment.

*7.4 Recorder Calibration, Number LR-459 Pen 2, Location MCB.

7.4.1 Remove TY-459 from location C8-453 and insert an extender card.

7.4.2 Connect a DC power supply and a DVM to pins 20(+) and 42(-) to the extender card.

7.4.3 Apply the inputs called for on data sheet 1 by adjusting the DC power supply and reading the DVM connected to the extender in location C8-453. Record the AS FOUND pen 2 values.

7.4.4 If required, adjust the recorder as instructed in Attachment A17 and repeat 7.4.

7.4.5 Record FINAL data.

*7.5 Calibration of Controller (NCB) Card LC-459F Style 2838A30G01, Location C8-123.

7.5.1 Record the NCB AS FOUND card edge switch and potentiometer settings on data sheet 2.

*7.5.2 Remove the NCB card and install it in the Controller/Driver test assembly. Install jumpers from 37 to 39.

7.5.3 Measure and record the AS FOUND voltage between pins 13(+) and 42(-). If necessary, adjust potentiometer M89-1 to obtain 10.0V $\pm$ 2.0mV. Record the FINAL value.

7.5.4 Connect a DVM to the COM/OUT jacks.

7.5.5 Place the test assembly M/A station in manual and depress the LOWER button until the low limit light comes on. Record the AS FOUND lower limit and, if necessary, adjust the LIMITS LOW potentiometer to obtain the REQUIRED value. Record the FINAL value.

7.5.6 Depress the test Assembly M/A station RAISE button until the high limit light comes on. Record the AS FOUND upper limit and, if necessary, adjust the LIMITS HIGH potentiometer to obtain the REQUIRED value. Record the FINAL value.

7.5.7 Connect a DVM to the BIAS and COM jacks and record the AS FOUND bias. If required, adjust the BIAS potentiometer to obtain the REQUIRED value. Record the FINAL value and disconnect the DVM from the BIAS and COM jacks.

7.5.8 Connect a DVM between the COM and SP jacks. Place the test assembly SETPOINT TEST SWITCH in the TEST position and record the AS FOUND setpoint value. If necessary, adjust potentiometer M90-3 to obtain a setpoint value of 0.0VDC ± 1.0mV. Record the FINAL value. Place the SETPOINT TEST SWITCH to the NORMAL position and adjust the test assembly M/A station potentiometer for a setpoint of 2.5VDC ± 0.005V as measured between pins 20(+) and 21(-).

7.5.9 Check the controller tracking by placing the test assembly M/A station in manual and applying the Inputs listed on data sheet 3 using the up/down push buttons. Monitor the input values using a DVM connected pin 34(+) and pin 36(-). Record the AS FOUND controller tracking outputs between pins 38(-) and 39(+).

7.5.10 Lift one end of jumper JR to defeat integral action.

7.5.11 Place the test assembly M/A station in automatic and check the controller proportional action by applying the inputs listed on data sheet 3 to pins 23(-) and 24(+). Record AS FOUND static output values at pins 38(-) and 39(+) after the controller has stablized for each input.

7.5.12 If AS FOUND tracking or proportional values are out of tolerance, adjust the NCB card as instructed in Attachment A4, then reconnect jumper JR and repeat steps 7.5.9 through 7.5.11 recording FINAL data.

7.5.13 Reconnect jumper JR and connect a recorder set for 10V full scale between pins 38(-) and 39(+).

7.5.14 Adjust the controller setpoint and the controller input to +5.0 volts.

7.5.15 Place the test assembly M/A station in manual and obtain a controller output of 1.0 volt to ensure sufficient chart space and to preclude controller windup.

Rev. 2

7.5.16 Place the test assembly M/A station in auto, start the recorder at 1.25cm/min and then step the controller input from 5.0 to 4.0 volts.

7.5.17 Determine and record the AS FOUND reset time constant by dividing the slope of the reset portion of the recorder trace (volts/sec) into the card's gain and multiplying by the change in the input (volts). Refer to Figure 1 (Δ Ein.).

7.5.18 If necessary, adjust the reset switches to obtain the REQUIRED reset time constant and repeat steps 7.5.14 through 7.5.17 until no further adjustment is necessary.

7.5.19 Record the FINAL reset time constant value. Attach the initial recorder trace and, if adjustments were made, the final recorder trace to the data package.

7.5.20 Reconnect jumper JR.

7.5.21 If the dynamic card function cannot be calibrated using the above procedure, refer to reference 1.1 of Attachment A4.

7.5.22 Record the FINAL card edge switch and potentiometer settings.

*7.5.23 Remove all test connections and re-install the NCB card.

*7.6 Calibration of Controller Driver (NCD) Card LCY-459F Style 2838A16G03, Location C8-124.

*7.6.1 Remove the NCD card and insert it in the Controller/Driver test assembly.

7.6.2 Place the test assembly M/A station in AUTO.

7.6.3 Connect a 250 Ω resistor to pins 19(+) and 22(-) and monitor the NCD card current output by connecting a DVM across the resistor.

7.6.4 Connect a voltage source to NCD pins 40(-) and 41(+) and apply the inputs called for on data sheet 3. Record AS FOUND output values.

7.6.5 If necessary, adjust the NCD card as instructed in Attachment A9.

7.6.6 Record FINAL output values

7.6.7 Place the test assembly M/A station in MANUAL and depress the LOWER button until the low limit light illuminates.

7.6.8 Connect a recorder across the resistor connected to pins 19(+) and 22(-) and set the recorder for 5V full scale.

7.6.9 Start the recorder and depress the test assembly M/A station RAISE button until the high limit light illuminates.

7.6.10 Verify that the card ramped smoothly from 1 to 5V in approximately 15 seconds.

7.6.11 If the output was not satisfactory, troubleshoot using reference 1.1 of Attachment A9.

7.6.12 Attach the recorder trace to the data package.

*7.6.13 Reinsert the NCD card in location C8-124.

7.6.14 Insert the NCB card in location C8-123.

*7.7 M/A Station Calibration Check, LK-459F.

7.7.1 Connect a DVM between the COM and OUTPUT jacks of the NCB in location C8-123.

7.7.2 Place LK-459F in MANUAL.

7.7.3 Adjust the M/A station output, using the up/down push buttons, to the values listed on data sheet 4 and record the AS FOUND setpoint readings at the NCB card.

7.7.4 If required, repair or replace LK-459F.

7.7.5 Return LK-459F to AUTO.

*7.8 Calibration of Signal Comparator (NAL) Card LB-459D Style 2837A23G01, Location C8-126.

7.8.1 Adjust the DC power supply, location C8-453 (level SP) connected in step 7.4.1, for 4.000 $\pm$ 0.001 VDC.

7.8.2 Connect a DC power supply and DVM to C8-122 (level) pins 6(+) and 9 (-).

7.8.3 Adjust the DC power supply (location C8-122) so that the comparator LB-459D is reset (OUTPUT 1 LED is OFF).

7.8.4 Slowly increase the input until the comparator trips (OUTPUT 1 LED is ON). and record on data sheet 5 the test point values at which the trip occurred.

7.8.5 Slowly increase the input until the comparator resets (OUTPUT 1 LED is OFF) and record on data sheet 5 the test point values at which the reset occurred.

7.8.6 If the trip or reset values are not within tolerance or if the INPUT values were in error, adjust the card as instructed in Attachment A7.

7.8.7 Record FINAL trip and reset values on data sheet 5.

*7.9 Functional Test of AC Controller (NAS) Card LY-459B Style 2837A89G02, location C8-736.

7.9.1 With comparator LB-459D (location C8-126) tripped verify annunciator H02 PRESSURIZER LEVEL DEVIATION HI - BACKUP HEATERS ON, is actuated.

7.9.2 With comparator LB-459D reset, verify annunciator H02 is cleared.

7.9.3 If the controller card malfunctioned, remove the card in accordance with FNP-0-IMP-442.3, 7300 Series NAI Card Removal. Replace the card and repeat step 7.9.1.

7.9.4 Record verification of AC controller card function on data sheet 5 (initial).

*7.10 Calibration of Signal Comparator (NAL) Card LB-459E Style 2837A13G01, Location C8-127.

7.10.1 Verify DC power supply in location C8-453 equals 4.000 $\pm$ 0.001 VDC.

7.10.2 Adjust the DC power supply (Location C8-122) so that comparator LB-454E is reset (OUTPUT 1 LED is ON).

7.10.3 Slowly decrease the input until the comparator trips (OUTPUT 1 LED is OFF) and record on data sheet 5 the test point values at which the trip occurred.

7.10.4 Slowly increase the input until the comparator resets (OUTPUT 1 LED is ON) and record on data sheet 5 the test point values at which the reset occurred.

7.10.5 If the trip or reset values are not within tolerance or if the INPUT values were in error, adjust the card as instructed in Attachment A7.

7.10.6 Record FINAL trip and reset values on data sheet 5.

*7.11 Functional Test of DC Controller (NAI) Card LY/459C Style 2837A88G06, Location C8-721.

7.11.1 With comparator LB-459E (location C8-127) tripped verify annunciator H12, PRESSURIZER LEVEL DEVIATION LO, is actuated.

7.11.2 With comparator LB-459E reset, verify annunciator H12 is cleared.

7.11.3 If the controller card malfunctioned, remove the card in accordance with FNP-0-IMP-442.2, 7300 Series NAI Card Removal. Replace the card and repeat 7.11.1.

7.11.4 Record verification of DC controller card function on data sheet 5 (initial).

7.11.5 Disconnect the test equipment at C8-453 and remove the extender card.

*7.11.6 Return card TY-459 to location C8-453.

*7.12 Calibration of Signal Comparator (NAL) Card LB-459C Style 2837A13G01, Location C8-125.

7.12.1 Adjust the DC power supply connected to C8-122 so that comparator LB-459C is reset. (OUTPUT LED is OFF).

7.12.2 Connect a DC power supply and a DVM to pins 14(+) and 17(-) on the extender card in location C8-122 and adjust the voltage to 5.0 + 1 volts. Verify that comparator LB-460C Output 2 is reset (OUTPUT 2 LED is OFF). Location C8-329.

7.12.3 Slowly decrease the voltage from DC power supply connected to C8-122 pin 6 (+) and pin 9 (-) until comparator LB-459C trips (OUTPUT LED is on). Record the AS FOUND voltage on data sheet 6.

7.12.4 Slowly increase the voltage from the DC power supply connected to C8-122 until Comparator LB-459C resets (OUTPUT LED is off). Record the AS FOUND voltage on Data Sheet 6.

7.12.5 If necessary, adjust the NAL card as instructed in Attachment A7.

7 12.6 Record FINAL trip and reset values.

*7.13 Functional Test of AC Controller (NAS) Card LY/459A Style 2838A89G01, Location C8-736.

7.13.1 With comparator LB-459C (location C8-125) tripped, verify annunciator H03, PRESSURIZER LEVEL LO-BACKUP HEATERS OFF AND LTDN SECURED is actuated.

7.13.2 With comparators LB-459C and LB-460C reset, verify annunciator H03 is cleared.

7.13.3 If the controller card malfunctioned, remove the card in accordance with FNP-0-IMP-442.3, 7300 Series NAS Card Removal. Replace the card and repeat 7.13.

7.13.4 Record verification of AC controller card function on data sheet 6 (initial).

*7.14 Calibration of Signal Comparator (NAL) Card LB-460C Style 2837A23G02, Location C5-329.

NOTE: The following is a test of a dual comparator OUTPUT 1 feeds LY-460A and OUTPUT 2 feeds LY-460.

7.14.1 Adjust the DC power supply Location C8-122, pins 14 and 17 so that comparator LB-460C, output 1 (location C5-329) is reset (OUTPUT 1 LED is on).

7.14.2 Slowly increase the input and record the AS FOUND value at which the comparator trips (as indicated by the OUTPUT 1 LED turning off) on data sheet 7.

7.14.3 Slowly decrease the input and record the AS FOUND value at which the comparator resets (as indicated by the OUTPUT 1 LED turning on).

7.14.4 If necessary, adjust the NAL card as instructed in Attachment A7.

7.14.5 Record FINAL trip and reset values.

7.14.6 Adjust the DC power supply so that comparator LB-460C, output 2 (Location C5-329) is reset (OUTPUT 2 LED is off).

7.14.7 Slowly decrease the input and record the AS FOUND value at which the comparator trips (as indicated by the OUTPUT 2 LED turning on) on data sheet 7.

7.14.8 Slowly increase the input and record the AS FOUND value at which the comparator resets (as indicated by the OUTPUT 2 LED turning off).

7.14.9 If necessary, adjust the NAL card as instructed in Attachment A7.

7.14.10 Record FINAL trip and reset values.

*7.15 Functional Test of DC Controller (NAI) Card LY/460A Style 2837A88G06, Location C5-426.

7.15.1 With Comparator LB-460C (Output 1) (location C5-329) tripped verify annunciator H11, PRESSURIZER WATER LEVEL HI is actuated.

7.15.2 With comparator LB-460C (Output 1) reset, verify annunciator H11 is cleared.

7.15.3 If the controller card malfunctioned, remove the card in accordance with FNP-0-IMP-442.2, 7300 Series NAI Card Removal. Replace the card and repeat 7.15.1.

7.15.4 Record verification of DC controller card function on data sheet 7 (initial).

*7.16 Functional Test of AC Controller (NAS) Card LY-460 Style 2838A89G01, location C5-436.

7.16.1 With comparator LB-460C, output 2 (location C5-329) tripped, verify annunciator H03,

PRESSURIZER LVL LO - BACKUP HEATERS OFF AND LTDN SECURED is actuated.

7.16.2 With comparators LB-460C, output 1 and LB-459 reset, verify annunciator H03 is cleared.

7.16.3 If the controller card malfunctioned, remove the card in accordance with FNP-0-IMP-442.3, 7300 Series NAS Card Removal. Replace the card and repeat 7.16.

7.16.4 Record verification of AC controller card function on data sheet 7 (initial).

7.17 Return to Service.

*7.17.1 Remove all test equipment and the extender card from location C8-122 and install the relay card removed in step 7.2.1.

*7.17.2 Remove the jumpers installed in step 7.1.1.

7.17.2.1 TB115-9 to TB116-1.

7.17.2.2 TB116-2 to TB116-6.

7.17.2.3 TB116-7 to TB116-11.

7.17.2.4 TB104-8 to TB115-2.

7.17.2.5 TB104-4 to TB117-6.

*7.17.3 Place AP L0483A to SCAN using the operator's console functions "Add/ Omit from SCAN".

*7.18 Notify the Shift Foreman that the test is complete.

FIGURE 1. RESET TIME CONSTANT

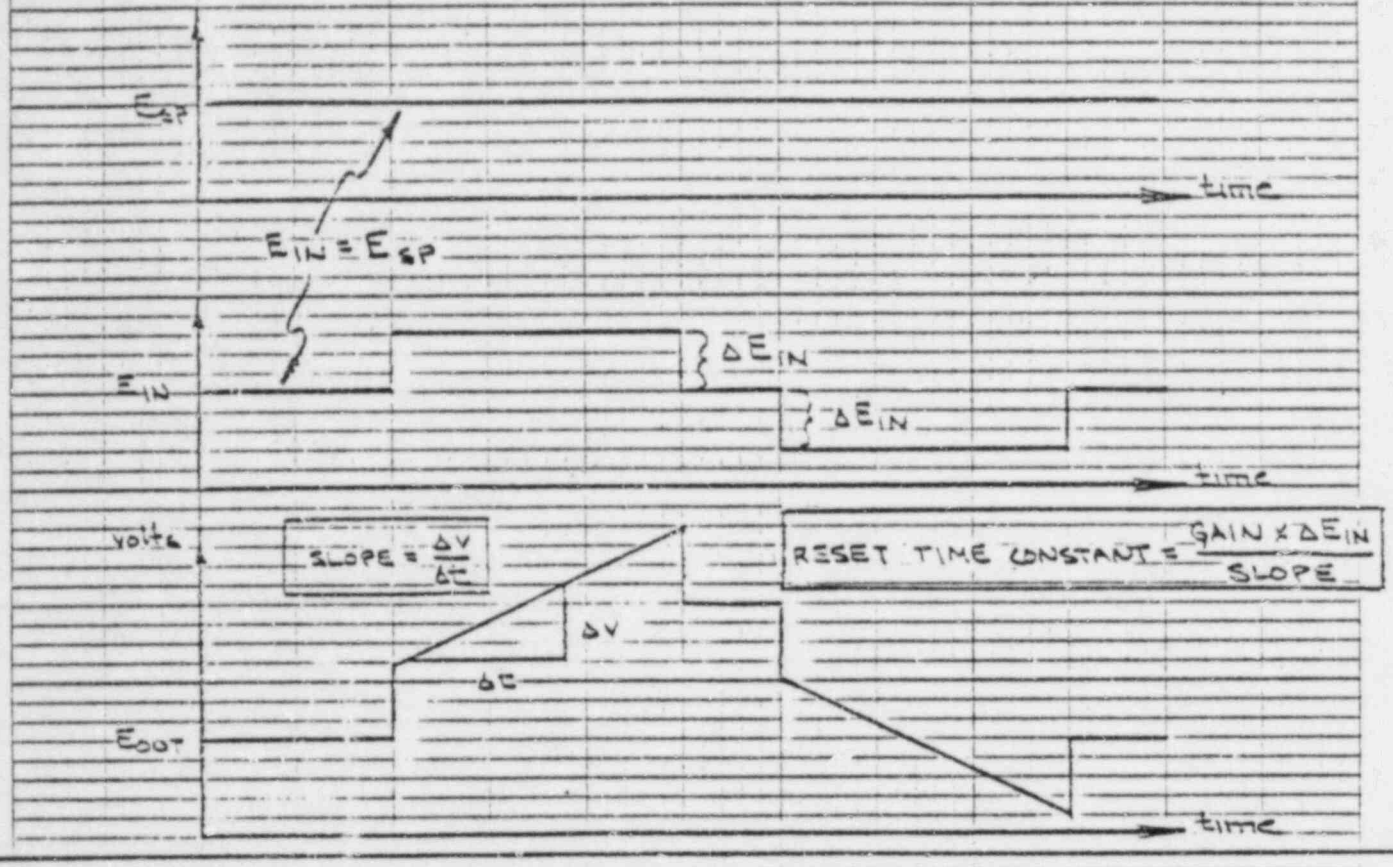
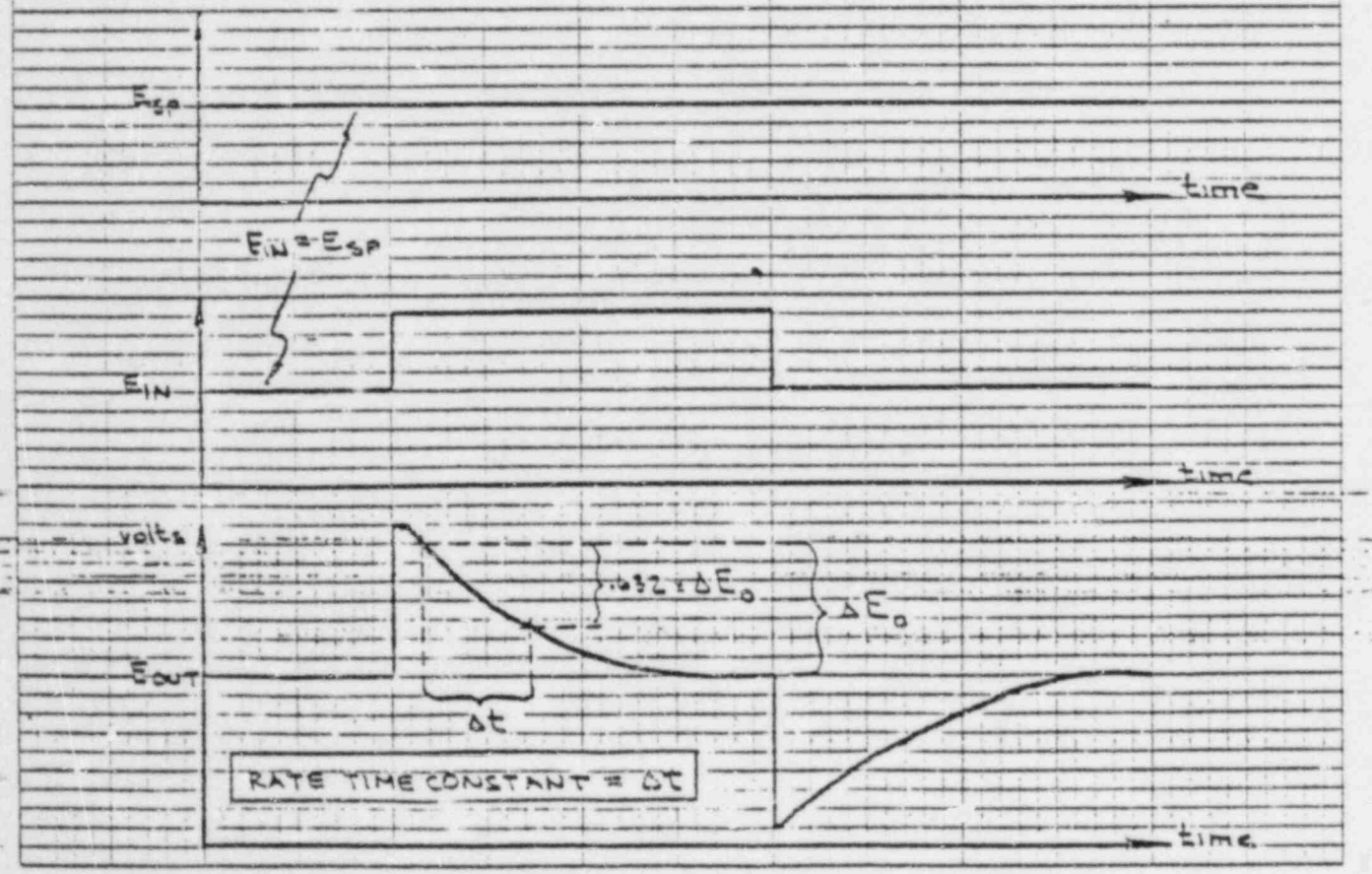


FIGURE 2. RATE TIME CONSTANT



FARLEY NUCLEAR PLANT
UNIT 1
INSTRUMENT MAINTENANCE PROCEDURE DATA PACKAGE IMP-201.22A

PRESSURIZER LEVEL CONTROL, LC-459F

1.0 Purpose

This data package is to be used in conjunction with procedure FNP-1-IMP-201.22 to record calibration data and provide calibration setpoints and tolerance.

2.0 References

2.1 Farley Nuclear Plant Precations, Limitations and Setpoints for Nuclear Steam Supply Systems.

2.2 Farley Nuclear Plant Process Instrumentation Accuracy Requirements and Guidelines, E-PCS-8327.

3.0 Procedure Sign-Off Sheet and Alteration Log

3.1 Initial the appropriate space in Table 1 as each step or section is completed in IMP-201.22.

3.2 Record on Table 2 any temporary alterations directed by IMP-442.1, IMP-442.2, IMP-442.3, IMP-442.4 of IMP-443.1 as the alteration are made or restored.

4.0 Test Results

4.1 ☐ Test completed satisfactory.

4.2 ☐ Deficiencies occurred (see data sheets for explanation).

4.3 Time required for test _____Procedure Rev. used_____.

4.4 Test performed by_____ Date_____.

4.5 Test reviewed by _____ Date_____.

This data package consists of 9 pages.

Rev. 2

STEP OR SECTION		INITIALS	STEP OR SECTION		INITIALS
6.0	Initial Conditions		7.13	NAS Cal.	
7.1	Test Mode		7.14	NAL Cal.	
7.2	NRC Cal. Ck.		7.15	NAI Cal.	
7.3	Recorder Cal.		7.16	NAS Cal.	
7.4	Recorder Cal.		7.17.1	Install NRC	
7.5	NCB Cal.		7.17.2	Remove jumpers	
7.5.2	Remove NCB Card		7.17.3	Return to SCAN	
7.5.23	Return NCB Card		7.18	Notify Shift Foreman	
7.6	NCD Cal.				
7.6.1	Remove NCD Card				
7.6.13	Return NCD Card				
7.7	M/A Cal. Ck.				
7.8	NAL Cal.				
7.9	NAS Cal.				
7.10	NAL Cal.				
7.11	NAI Cal.				
7.11.6	Return NSA Card				
7.12	NAL Cal.				

TABLE 1. PROCEDURE SIGNOFF

DESCRIPTION OF ALTERATION	ALTEREL	RESTORED

TABLE 2. TEMPORARY ALTERATION LOG

...ION:

		MONITOR: LR-459 (Pen 1)			LOCATION: MCB	
	UNITS VDC	UNITS %	HIGH TOLERANCE +1	LOW TOLERANCE -1	TYPE: Hagen	
					STYLE: Optimac	
...BLE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
	0	0				
	2.5	25				
	5.0	50				
	7.5	75				
	10.0	100				
	7.5	75				
	5.0	50				
	2.5	25				
	0	0				

...MENT NUMBER

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/459X-459Z 7.2.3

	MONITOR: LR-459 (Pen 2)			LOCATION: MCB	
UNITS %	HIGH TOLERANCE +1	LOW TOLERANCE -1		TYPE: Hagen	
				STYLE: Optimac	
REQUIRED	AS FOUND	ERROR		FINAL	ERROR
0					
25					
50					
75					
100					
75					
50					
25					
0					

SPECIAL CHECKS/REMARKS

Verified: Section Initials

TER: LC-459F LOCATION: C8-123 TYPE: NCB STYLE: 2838A30G01

INSTRUCTIONS: Controller is proportional plus integral. gain equals 4.024

E:

UNITS	UNITS VDC	TRACKING OUTPUT DATA					STATIC OUTPUT DATA				
		UNITS VDC	HIGH TOLERANCE +0.01	LOW TOLERANCE -0.01			UNITS VDC	HIGH TOLERANCE +0.05	LOW TOLERANCE -0.05		
ANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
	0.00	0.00					10.00				
	0.50	--					8.048				
	1.00	--					6.036				
	1.50	--					4.024				
	2.00	--					2.012				
	2.50	2.50					0.00				
	5.00	5.00					--				
	7.50	7.50					--				
	10.00	10.00					--				
	7.50	7.50					--				
	5.00	5.00					--				
	2.50	2.50					0.00				
	2.00	--					2.012				
	1.50	--					4.024				
	1.00	--					6.036				
	0.50	--					8.048				
	0.00	0.00					10.000				

UIPMENT NUMBER

MISCELLANEOUS DATA

FUNCTION	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
LOWER LIMIT	0.0				
UPPER LIMIT	10.0				
BIAS	0.0				
SETPOINT	0.0				
RESET TIME CONST	300sec				
RATE TIME CONST	0.0				

SWITCH/POTENTIOMETER SETTINGS

SWITCH/POT	AS FOUND	FINAL
GATE POT.		
GAINX 2 POT		
GAINX.2 POT		
RESETSWITCH		
OFFSET POT.		

SPECIAL CHECKS/REMARKS: REFERENCE VOLTAGE (pins 13(+) to 42(-)) AS FOUND: FINAL:

Pressurizer Level Control, LC-459F

UNITS	UNITS VDC	UNITS VDC	HIGH TOLERANCE +0.01	LOW TOLERANCE -0.01	MONITOR: LCY-459F LOCATION: C8-124 TYPE: NCD STYLE: 283BA16G03		MONITOR:	HIGH TOLERANCE	LOW TOLERANCE	LOCATION: TYPE: STYLE:	
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
	0.0	0.00									
	2.5	2.50									
	5.0	5.00									
	7.5	7.50									
	10.0	10.00									
	7.5	7.50									
	5.0	5.00									
	2.5	2.50									
	0.0	0.00									

ITEMIZE NUMBER

SPECIAL CHECKS/REMARKS

Verified: Section Initials

SPECIAL CHECKS/REMARKS

Verified: Section Initials

	MONITOR: LK-459F			LOCATION: MCB	
UNITS	UNITS %	UNITS VDC	HIGH TOLERANCE +0.075	LOW TOLERANCE -0.075	TYPE: M/A STYLE:
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL / ERROR
	0	0.000			
	25	1.250			
	50	2.500			
	75	3.750			
	100	5.000			
	75	3.750			
	50	2.500			
	25	1.250			
	0	0.000			

	MONITOR:			LOCATION:
UNITS		HIGH TOLERANCE	LOW TOLERANCE	TYPE: STYLE:
	REQUIRED	AS FOUND	ERROR	FINAL / ERROR

TEST NUMBER

SPECIAL CHECKS/REMARKS

Verified: Section Initial:

SPECIAL CHECKS/REMARKS

Verified: Section Initial:

		MONITOR: LB-459D			LOCATION: C8-126	
UNITS	UNITS	UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE -0.025	TYPE: NAL	
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	STYLE: 2837A13G01 FINAL	ERROR
		TRIP				
		4.500				
		RESET				
		4.400				

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/459B (Ann. H02) 7.9

		MONITOR: LB-459E			LOCATION: C8-127	
		UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE - 0.025V	TYPE: NAL	
		REQUIRED	AS FOUND	ERROR	STYLE: 2837A13G01 FINAL	ERROR
		TRIP				
		3.500				
		RESET				
		3.600				

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/459C (Ann. H12) 7.11

UNITS	UNITS	MONITOR: LP-459C UNITS VDC	HIGH +0.025	LOW -0.025	LOCATION: C8-125 TYPE: NAL STYLE: 2837A13G01		MONITOR: UNITS	HIGH	LOW	LOCATION: TYPE: STYLE:	
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
		TRIP 1.500									
		RESET 1.600									

TE OR NUMBER	SPECIAL CHECKS/REMARKS		SPECIAL CHECKS/REMARKS	
	Verified:	Section Initials	Verified:	Section Initials
	LY-459A (Ann. H03)	7.13		

UNITS	UNITS	MONITOR: LB-460C (Output 1) UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE -0.025	LOCATION: C8-125 TYPE: NAL STYLE: 2837A13G02	
RANGE	VARIABLE	REQUIRED	AS FOUND	ERROR	FINAL	ERROR
		TRIP				
0		7.000				
0						
		RESET				
		6.900				

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/460A (Ann. H11) 7.15

MONITOR: LB-460C (Output 2) UNITS VDC	HIGH TOLERANCE +0.025	LOW TOLERANCE -0.025	LOCATION: C8-125 TYPE: NAL STYLE: 2837A13G02	
REQUIRED	AS FOUND	ERROR	FINAL	ERROR
TRIP				
1.500				
RESET				
1.600				

SPECIAL CHECKS/REMARKS

Verified: Section Initials

LY/460 (Ann. H03) 7.16