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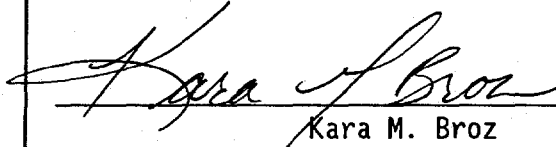
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**SUPPORTING DOCUMENT**

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7. Abstract

This test procedure provides the steps necessary to verify correct functional operation of controls, annunciators, alarms, protective relays and related systems impacted by CENRTC #2F3EOA, Microwave Transfer Trip Project, modification work performed under work package 6B-93-00043/M (CENRTC 2F3EOA MWTT OCB A-386 PACKAGE).

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**WHC-SD-LL-ATP-024  
Revision 0**

**CENRTC PROJECT #2F3E0A  
OCB A-386  
ACCEPTANCE TEST PROCEDURE**

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Prepared By:  
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**MASTER**

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## 1.0 PURPOSE

This test procedure provides the steps necessary to verify correct functional operation of controls, annunciators, alarms, protective relays and related systems impacted by CENRTC #2F3E0A, Microwave Transfer Trip Project, modification work performed under work package 6B-93-00043/M (CENRTC 2F3E0A MWTT OCB A-386 PACKAGE). Acceptance testing of the RFL Dowety model 6750 (Rack C3) system will be performed under WHC-SD-LL-ATP-023 (A-382 ATP).

## 2.0 SCOPE

This acceptance test procedure shall only be used in conjunction with work package 6B-93-00043/M.

## 3.0 REFERENCES

- 3.1 Marked-up blue lines from work package 6B-93-00043/M.
- 3.2 Copy of ECN 604870 and the latest revision of the substation A8 one-line, three-lines, control and interconnection drawings.

## 4.0 ACCEPTANCE TEST PROCEDURE

- 4.1 A Lead Protective Relay Technician shall be appointed by the Substation/Relay Manager prior to this work commencing. **The Lead Technician shall be responsible for initialing each step of Sections 5 through 9 as it is successfully completed, regardless of additional signature or initialing requirements indicated in a particular step.**
- 4.2 It is the responsibility of the **Lead Relay Technician** to report any discrepancies or problems associated with the following steps to the EUE System Protection Engineer and record same in Section 10.0.
- 4.3 The EUE System Protection Engineer shall be present for all testing.
- 4.4 This procedure separates four tests into separate sections.
  - Section 5.0 - Energization of A-386 Duplex Panel and Circuits
  - Section 6.0 - Local RFL 6750 function tests and start-up.
  - Section 7.0 - SCADA tests.
  - Section 8.0 - A-386 local trip tests.
- 4.5 A8 should be configured with C8X100-200 closed and C8X200 open.

5.0 ENERGIZATION OF A-386 DUPLEX PANEL AND CIRCUITS

5.1 Equipment Configuration

5.1.1 Verify the following test switches are in the open position.

Panel 1	
Device Number	Description
3G	SEL SET #1 TRIP AND MONITOR CONTACTS
4G	SEL SET #1 AC VOLTAGE INPUT
5G	SEL SET #1 CURRENT AND POLARIZATION INPUT
6G	SEL SET #2 TRIP AND MONITOR CONTACTS
7G	SEL SET #2 AC VOLTAGE INPUT
8G	SEL SET #2 CURRENT AND POLARIZATION INPUT

Panel 7		
Device	Test Switch	Description
7R	POLE 1-2	OCB A-386 TRIP VIA 86-T2
7R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK VIA 86-T2
7N	POLE 7-8	C8X200 TRIP VIA 86-T2
7N	POLE 9-10-11-12	C8X200 CLOSE BLOCK VA 86-T2
7N	POLE 13-14	OCB A-384 TRIP VIA 86-T2
7N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK VIA 86-T2
3R	POLE 1-2	OCB A-386 TRIP VIA 86-TB2
3R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK VIA 86-TB2
3N	POLE 7-8	C8X200 TRIP VIA 86-TB2
3N	POLE 9-10-11-12	C8X200 CLOSE BLOCK VA 86-TB2
3N	POLE 13-14	OCB A-384 TRIP VIA 86-TB2
3N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK VIA 86-TB2

5.1.2 Verify the following SCADA switches are in the open position.

Panel 2, Mini-Control Panel	
Device Number	Description
A-386 SCS	A-386 SCADA CUT-OFF SWITCH
A-386 RCS	A-386 RECLOSING CUT-OFF SWITCH
A-386 HOTLINE	A-386 HOT LINE BYPASS SWITCH

5.1.3 Verify the following 125 Vdc breakers are in the open position.

Panel or Rack	Device Number	Description
Panel 1	2M	A-386 TRIP BUS BFR
	3M	A-386 TRIP BUS RELAY SET #1
	4M	A-386 TRIP BUS RELAY SET #2
Panel 2	2M	A-386 LOCAL CONTROL BUS
	3M	A-386 CLOSE BUS
	4M	A-386 TRIP BUS
	5M	ANNUNCIATOR BUS (ANNUNCIATOR & SCADA)
Panel 7	6L	TRIP BUS TRANS. BANK #2 DIFF. (86-TB2)
	8L	230 KV BUS NO. 2 DIFF. (86-T2)
Rack C3	1E	A-382 RFL
	2E	A-386 RFL

5.1.4 Verify the following 115 Vac breakers are in the open position.

Panel or Rack	Device Number	Description
Panel 1	LM1	A-386 RELAY POT #2A RELAY SET #1
	LM2	A-386 RELAY POT #2 RELAY SET #2
Bus #2 PT Cabinet	RLY POT #2	RELAY POTENTIAL #2 BREAKER
	RLY POT #2A	RELAY POTENTIAL #2A BREAKER



5.1.5 Verify the devices are switched to the OFF position.

Panel or Rack	Device Number	Description
Rack C3	C	A-382 RFL 6750
	D	A-386 RFL 6750
Panel 1	3C	A-386 SEL 121-G-5 SET #1 RELAY
	4C	A-386 SEL 121-G-5 SET #2 RELAY
	5C	A8 SEL PRTU

5.1.6 Verify the manual test switch on the RFL 6750 relays on Rack C3 are switched to the OFF position.

**5.2 Energize A386 Control Circuits**

5.2.1 Energize the A8 annunciator bus by closing device 5M, located on Panel 2. Acknowledge and reset alarms: Verify the following annunciators remain illuminated and that the Dispatcher indicates the following SCADA Indication Points.

Annunciator Window	SCADA Points
W26 - 230 KV TRIP BUS FAILURE	43 - A-386 PCB TRIP BUS FAILURE
W28 - 230 KV CLOSE FAILURE	47 - A-386 CLOSE BUS FAILURE
W40 - A-386 SEL RELAY TROUBLE	03 - SEL RELAY TROUBLE
W46 - SEL PRTU TROUBLE	N/A
W30 - 230 KV RELAY POT FAILURE	55 - 230KV RELAY POTENTIAL FAILURE
W34 - BUS 2 PT ACB TRIP ALARM	

5.2.2 Close the following 125 Vdc breakers and verify, where noted, that the associated annunciator clears after the alarm has been acknowledged and reset and that the Dispatcher indicates the same for the respective SCADA Indication Points.

Panel 1			
Device Number	Description	Annunciator Window	SCADA Alarm
2M	A-386 TRIP BUS BFR	N/A	N/A
3M	A-386 TRIP BUS RELAY SET #1	N/A	N/A
4M	A-386 TRIP BUS RELAY SET #2	N/A	N/A

Panel 2			
Device Number	Description	Annunciator Window	SCADA Alarm
2M	A-386 LOCAL CONTROL BUS	N/A	19 - A-386 PCB 22 - A-386 RR 25 - A-386 RR SCS 29 - A-386 SCS 50 - A-386 HLI
3M	A-386 CLOSE BUS	W28 - 230 KV CLOSE FAILURE	47 - A-386 CLOSE BUS
4M	A-386 TRIP BUS	W26 - 230 KV TRIP BUS FAILURE	43 - A-386 TRIP BUS

5.2.3 Close the following 115 Vac breakers and verify, where noted, that the associated annunciator clears after the alarm has been acknowledged and reset and that the Dispatcher indicates the same for the respective SCADA Indication Points.

Panel or Rack	Device Number	Description	Annunciator Window	SCADA Point
1	LM1	A-386 RELAY POT #2A RELAY SET #1		
	LM2	A-386 RELAY POT #2 RELAY SET #2	W30 - 230KV RELAY POT FAILURE	
BUS #2 PT CABINET	RLY POT #2	RELAY POTENTIAL #2 BREAKER		
	RLY POT #2A	RELAY POTENTIAL #2A BREAKER	W34 - BUS 2 PT ACB TRIP ALARM	55 - 230 KV RELAY POTENTIAL FAILURE
	METER POT #2	METER POTENTIAL #2 BREAKER		
	INST POT #2	INSTRUMENT POTENTIAL #2 BREAKER		

5.2.4 Switch the following devices to the ON position and verify, where noted, that the associated annunciator clears after the alarm has been acknowledged and reset and that the Dispatcher indicates the same for the respective SCADA Indication Points.

Panel or Rack	Device Number	Description	Annunciator Window	SCADA Point
1	3C	A-386 SEL 121-G-5 SET #1 RELAY		
	4C	A-386 SEL 121-G-5 SET #2 RELAY	W40 - A386 SEL RELAY TROUBLE	03 - SEL RELAY TROUBLE
	5C	A8 SEL PRTU	W46 - SEL PRTU TROUBLE	N/A

**5.3 Local OCB A-386 Operation and Alarm Verification**

- \_\_\_\_\_ 5.3.1 Place a temporary jumper between terminal **3** and **10** of Device **6S** (A-386 Sync Check Relay) on Panel **1**.
- \_\_\_\_\_ 5.3.2 Place the **SCADA cut-off switch (SCS) for OCB A386** in the closed (in the **ON** position).
- \_\_\_\_\_ 5.3.3 Verify with the Dispatcher that SCADA has indicated that the **A-386 SCS** switch is **CLOSED** (verifies SCADA Indication Point 29 - A-386 SCS Status).
- \_\_\_\_\_ 5.3.4 From the mini-control panel (Panel 2) **CLOSE**, then **OPEN OCB A-386**.
- \_\_\_\_\_ 5.3.5 Verify the breaker closes and opens on command.
- \_\_\_\_\_ 5.3.6 Verify with the Dispatcher that SCADA has indicated the close and open operations (verifies SCADA Indication Point 19 - A-386 PCB Status).
- \_\_\_\_\_ 5.3.7 Verify the A-386 indication lamps (green and red) have indicated the proper status during the open and closing cycles.

**5.4 Return Test Switch Configuration to Normal**

- \_\_\_\_\_ 5.4.1 Place the following test switches in the closed position.

Panel 1	
Device Number	Description
3G	SEL SET #1 TRIP AND MONITOR CONTACTS
4G	SEL SET #1 AC VOLTAGE INPUT
5G	SEL SET #1 CURRENT AND POLARIZATION INPUT
6G	SEL SET #2 TRIP AND MONITOR CONTACTS
7G	SEL SET #2 AC VOLTAGE INPUT
8G	SEL SET #2 CURRENT AND POLARIZATION INPUT

Panel 7		
Device	Test Switch	Description
7R	POLE 1-2	OCB A-386 TRIP VIA 86-T2
7R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK VIA 86-T2
7N	POLE 7-8	C8X200 TRIP VIA 86-T2
7N	POLE 9-10-11-12	C8X200 CLOSE BLOCK VA 86-T2
7N	POLE 13-14	OCB A-384 TRIP VIA 86-T2
7N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK VIA 86-T2
3R	POLE 1-2	OCB A-386 TRIP VIA 86-TB2
3R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK VIA 86-TB2
3N	POLE 7-8	C8X200 TRIP VIA 86-TB2
3N	POLE 9-10-11-12	C8X200 CLOSE BLOCK VA 86-TB2
3N	POLE 13-14	OCB A-384 TRIP VIA 86-TB2
3N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK VIA 86-TB2

**5.5 Energization of A-386 Duplex Panels and Circuits Tests Acceptance**

5.5.1 The Lead Relay Technician and EUE System Protection Engineer shall sign below indicating tests have been completed successfully.

\_\_\_\_\_  
 Lead Relay Technician

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 EUE System Protection Engineer

\_\_\_\_\_  
 Date

6.0 LOCAL RFL 6750 FUNCTION TESTS AND START-UP

NOTE: LOCAL RFL 6750 FUNCTIONAL TEST AND START-UP WILL BE PERFORMED ON WHC-SD-LL-ATP-023 (A-382 ATP).

7.0 SCADA TESTS

7.1 Status of Previously Verified SCADA Indication Points Tests

7.1.1 The following SCADA indication points were alarmed in step 5.2.1 and cleared in previous steps and therefore have been verified.

SCADA Point	Clear Step
03 - SEL RELAY TROUBLE	5.2.4
55 - 230KV RELAY POTENTIAL FAILURE	5.2.3
43 - A-386 TRIP BUS FAILURE	5.2.2
47 - A-386 CLOSE BUS FAILURE	5.2.2

7.1.2 The following SCADA indication points were alarmed in step 5.2.2 and cleared in previous steps, except where noted, and therefore have been verified.

SCADA Point	Clear Step
19 - A-386 PCB STATUS	5.3.6
22 - A-386 RECLOSING STATUS	TO BE DONE IN STEP 7.3.1
25 - A-386 RR SCS	TO BE DONE IN STEP 7.2.3
29 - A-386 PCB SCS	5.3.3
50 - A-386 HOT LINE INDICATION STATUS	TO BE DONE IN STEP 7.2.2

**7.2 Remaining SCADA Indication Points Tests**

**7.2.1 RLF 6750 SCADA Indication Points.**

**NOTE: THE SCADA DATABASE HAS NOT BEEN UPDATED AT THIS TIME. THESE SCADA POINTS WILL BE TESTED AT A LATER DATE, WHEN THE DATABASE IS UPDATED. THEREFORE STEP 7.2.1.1 IS NOT TO BE PERFORMED.**

**7.2.1.1** Simulate contact closure by placing a shorting strip between the following contacts of the RFL Relays, located on Rack C3, to activate the associated SCADA indication points. Test one SCADA indication point alarm at a time. Verify alarm with the Dispatcher, remove shorting strip, then verify with the Dispatcher that the alarm has cleared.

Rack C3		
RFL Unit	Terminals to Short (located on RFL Unit)	SCADA Point
A-382	C2-9 and C2-10	06 - A-382 DTT SENT
	C2-31 and C2-32	07 - A-382 DTT RECEIVED
A-386	D2-9 and D2-10	10 - A-386 DTT SENT
	D2-31 and D2-32	37 - A-386 DTT RECEIVED

**7.2.2 New Major Alarm SCADA Indication Points.**

**7.2.2.1** Verify with the dispatcher that SCADA Indication Point 02 "230 kV Annunciator Alarm Drop" has activated during the previous steps (verifies SCADA indication point 02).

**NOTE: THE SCADA DATABASE HAS NOT BEEN UPDATED AT THIS TIME. THESE SCADA POINTS WILL BE TESTED AT A LATER DATE, WHEN THE DATABASE IS UPDATED. THEREFORE STEP 7.2.2.2 IS NOT TO BE PERFORMED.**

7.2.2.2 Simulate contact closure by placing a shorting strip between the following contacts at Duplex Panel 2, to activate the associated SCADA indication points. Test one SCADA indication point alarm at a time. Verify alarm with the Dispatcher, remove shorting strip, then verify with the Dispatcher that the alarm has cleared.

Panel 2	
Terminals to Short	SCADA Point
SC3-1 & SC3-3	56 - Bank No. 1 High Oil Temperature
SC4-1 & SC4-3	35 - Bank No. 1 Low Oil Level
SC8-1 & SC8-3	57 - Bank No. 2 High Oil Temperature
SC9-1 & SC9-3	36 - Bank No. 2 Low Oil Level

7.2.3 Line A2 (Midway) Hot Line/Dead Line SCADA Indication Point

7.2.3.1 This SCADA indication point activates upon an open contact. Simulate an open contact by lifting the lead at the following terminal of the NGV (Hot Line) Relay (Device 6V), located on Panel 1, to activate the associated SCADA indication point. Verify alarm with the Dispatcher, remove shorting strip, then verify with the Dispatcher that the alarm has cleared.

Panel 1		
NGV Relay	Terminal to lift (located on NGV Relay)	SCADA Point
6V	7 (left terminal)	50 - MIDWAY LINE HOTLINE INDICATOR



7.2.4 A-386 Reclosing SCS Switch

- \_\_\_\_\_ 7.2.4.1 Place the Reclosing cut-off switch (**RCS**) for OCB **A-386** in the **CLOSED** (in the **ON** position).
- \_\_\_\_\_ 7.2.4.2 Verify with the Dispatcher that SCADA has indicated that the A-386 Reclosing SCS switch is closed (verifies SCADA Indication Point 25).
- \_\_\_\_\_ 7.2.4.3 Place the Reclosing cut-off switch (**RCS**) for OCB **A-386** in the **OPEN** (in the **OFF** position).

**7.3 SCADA Control Verification**

7.3.1 A-386 Open and Close Controls

- \_\_\_\_\_ 7.3.1.1 Request the Dispatcher to **CLOSE**, then **OPEN** OCB **A-386** from the Dispatchers Terminal.
- \_\_\_\_\_ 7.3.1.2 Verify the breaker closes and opens on command (verifies SCADA Control Point 06).
- \_\_\_\_\_ 7.3.1.3 Acknowledge and Reset annunciators.

7.3.2 A-386 Reclosing Controls

- \_\_\_\_\_ 7.3.2.1 Request the Dispatcher to place then remove the reclosing relay system for **A-386** into and out-of service from the Dispatchers Terminal.
- \_\_\_\_\_ 7.3.2.2 Verify with the Dispatcher that SCADA has indicated that the reclosing system was placed into and out-of service (verifies SCADA Control Point 09 and Indication Point 22).
- \_\_\_\_\_ 7.3.2.3 Have the Dispatcher acknowledge and reset the SCADA alarms.

**7.4 SCADA Indication and Control Points Tests Acceptance**

7.4.1 The **Lead Relay Technician** and **EUE System Protection Engineer** shall sign below indicating tests have been completed successfully.

\_\_\_\_\_

Lead Relay Technician

\_\_\_\_\_

Date

\_\_\_\_\_

EUE System Protection Engineer

\_\_\_\_\_

Date

8.0 A-386 LOCAL TRIP TESTS

8.1 System Configuration

NOTE: OCB'S A-384 & A-386, AND PCB C8X200 WILL BE OPERATED DURING THE FOLLOWING TRIP TESTS.

\_\_\_\_\_ 8.1.1 Verify switches A-384B1 and A-386LS are open.

\_\_\_\_\_ 8.1.2 Verify C8X200 is racked out and in the test position.

8.2 Trip Testing General Procedure

\_\_\_\_\_ 8.2.1 Each "trip circuit" within a relay device will be tested. For example, trip testing a 50/51 overcurrent relay will include tripping: 1) the instantaneous element contact; 2) time overcurrent element contact; and 3) seal-in element contact. Therefore when the following steps instruct the meter/relay technician to to trip a relay, then all the elements related to the relay should be trip tested, unless otherwise specified.

8.3 Circuit Breaker Open/Close Operations

\_\_\_\_\_ 8.3.1 **CLOSE** and **OPEN** OCB **A-386** from the mini-control panel to verify it is operating correctly.

\_\_\_\_\_ 8.3.2 Request that the dispatcher **CLOSE** and **OPEN** OCB **A-386** via SCADA to verify correct operations occur.

\_\_\_\_\_ 8.3.3 **CLOSE** and **OPEN** OCB **A-384** from the mini-control panel to verify it is operating correctly.

\_\_\_\_\_ 8.3.4 Request the dispatcher **CLOSE** and **OPEN** OCB **A-384** via SCADA, then verify correct operations occur.

**8.4 Transformer #2 Trip Testing**

8.4.1 Manually operate the **50/51-TH2** A-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below. **DO NOT RESET ANY LOCKOUTS OR CLOSE CIRCUIT BREAKERS AT THIS POINT:**

50/51-TH2 A-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
A-386		
A-384		
C8X200		
LOCAL ANNUNCIATION	Verify by placing a check below	
W2 - OCB A-386 OPERATION		
W7 - OCB A-384 OPERATION		
W37 - PCB C8X200 OPERATION		
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.2 Attempt to locally close each of the tripped circuit breakers and lock-out relays indicated in 8.4.1. **None should close.**

8.4.3 Request the Dispatcher attempt to remotely close the tripped circuit breakers and lock-out relays indicated in 8.4.1. **None should close.**

8.4.4 Reset the **86-TB2** and locally **CLOSE** circuit breakers **A-386, A-384,** and **C8X200.**

8.4.5 Clear targets and local annunciators and verify with the Dispatcher that associated SCADA alarms have also cleared.

8.4.6 Disable the 86-TB2 functions by **OPENING** the following test switch poles located on device 3R and 3N on 230 kV duplex Panel 7:

Panel 7		
Device	Test Switch	Description
3R	POLE 1-2	OCB A-386 TRIP
3R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK
3N	POLE 13-14	OCB A-384 TRIP
3N	POLE 7-8	VCB C8X200 TRIP
3N	POLE 9-10-11-12	VCB C8X200 CLOSE BLOCK
3N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK

**NOTE: THE REMAINING TRIP TESTS INVOLVING THE 86-TB2 RELAY WILL NOT OPERATE CIRCUIT BREAKERS -- ONLY THE 86-TB2 LOCKOUT RELAY OPERATIONS WILL BE OBSERVED.**

8.4.7 Manually operate the 50/51-TH2 B-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

50/51-TH2 B-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.8 Manually operate the 50/51-TH2 C-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

50/51-TH2 C-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.9 Manually operate the 51G-TH2 residual relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

51G-TH2 RESIDUAL RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.10 Jumper across terminal 375 & 376 on Panel 2 to simulate an 63-T2 sudden pressure relay operation -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

63-T2 SUDDEN PRESSURE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.11 Manually operate the 51GB-GT2 zig-zag residual relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

51GB-GT2 ZIG-ZAG RESIDUAL RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-TB2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.12 Manually operate the 50G-GT2 zig-zag residual alarm relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

50G-GT2 ZIG-ZAG RESIDUAL ALARM RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
NONE		
LOCAL ANNUNCIATION	Verify by placing a check below	
W22 - BANK 2 13.8 KV GND RELAY		

8.4.13 Manually operate the 51GT-2 zig-zag A-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

51GT-2 ZIG-ZAG A-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86TB-2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.14 Manually operate the 51GT-2 zig-zag B-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

51G-2 ZIG-ZAG B-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86TB-2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.15 Manually operate the 51GT-2 zig-zag C-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

51G-2 ZIG-ZAG C-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86TB-2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W24 - BANK 2 DIFFERENTIAL TRIP		



8.4.16 Manually operate the **BFR-86** breaker failure relay (terminals 19 & 20 only, terminals 1 & 10 will be tripped during WHC-SD-LL-ATP-023 [A382 ATP]) -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>BFR-86 BREAKER FAILURE RELAY</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
86TB-2 (19 & 20)		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
W24 - BANK 2 DIFFERENTIAL TRIP		

8.4.17 Manually operate the 87-TL2 A-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below. **DO NOT RESET ANY LOCKOUTS OR CLOSE CIRCUIT BREAKERS AT THIS POINT:**

87-TL2 A-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-T2		
A-386		
A-384		
C8X200		
LOCAL ANNUNCIATION	Verify by placing a check below	
W2 - OCB A-386 OPERATION		
W7 - OCB A-384 OPERATION		
W37 - PCB C8X200 OPERATION		
W36 - BUS #2 DIFFERENTIAL TRIP		

8.4.18 Attempt to locally close each of the tripped circuit breakers and lock-out relays indicated in 8.4.17. **None should close.**

8.4.19 Request the Dispatcher attempt to remotely close the tripped circuit breakers and lock-out relays indicated in 8.4.17. **None should close.**

8.4.20 Reset the 86-T2 and locally close circuit breakers A-386, A-384, and C8X200.

8.4.21 Clear targets and local annunciators and verify SCADA alarms are also cleared.

8.4.22 Disable the **86-T2** functions by **OPENING** the following test switch poles located on device **7R** and **7N** on 230 kV duplex Panel 7:

Panel 7		
Device	Test Switch	Description
7R	POLE 1-2	OCB A-386 TRIP
7R	POLE 3-4-5-6	OCB A-386 CLOSE BLOCK
7N	POLE 7-8	VCB C8X200 TRIP
7N	POLE 9-10-11-12	VCB C8X200 CLOSE BLOCK
7N	POLE 13-14	OCB A-384 TRIP
7N	POLE 15-16-17-18	OCB A-384 CLOSE BLOCK

**NOTE: THE REMAINING TRIP TESTS INVOLVING THE 86-T2 RELAY WILL NOT OPERATE CIRCUIT BREAKERS -- ONLY THE 86-T2 LOCKOUT RELAY OPERATIONS WILL BE OBSERVED.**

8.4.23 Manually operate the **87-TL2** B-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

87-TL2 B-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-T2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W36 - BUS #2 DIFFERENTIAL TRIP		

8.4.24 Manually operate the **87-TL2** C-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>87-TL2 C-PHASE RELAY</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
86-T2		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
<b>W36 - BUS #2 DIFFERENTIAL TRIP</b>		

**8.5 230 kV Bus #2 Trip Testing**

8.5.1 Manually operate the **87B2-TH2** A-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>87B2-TH2 A-PHASE RELAY</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
86-T2		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
<b>W36 - BUS #2 DIFFERENTIAL TRIP</b>		

8.5.2 Manually operate the 87B2-TH2 B-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

87B2-TH2 B-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-T2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W36 - BUS #2 DIFFERENTIAL TRIP		

8.5.3 Manually operate the 87B2-TH2 C-phase relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

87B2-TH2 C-PHASE RELAY		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
86-T2		
LOCAL ANNUNCIATION	Verify by placing a check below	
W36 - BUS #2 DIFFERENTIAL TRIP		

**8.6 230 kV A-386 JBCG Line Relaying Trip Testing**

**NOTE: OCB A-386 WILL OPEN AFTER EACH STEP IN THIS SECTION. CLOSE OCB A-386 AND RESET ANY ANNUNCIATORS AFTER THE COMPLETION OF EACH STEP.**

8.6.1 Manually operate the directional time overcurrent element on the **67GB-86** directional ground overcurrent relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>67GB-86 DIRECTIONAL GROUND OVERCURRENT RELAY (DIRECTIONAL TIME OVERCURRENT ELEMENT)</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
A-386		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
<b>W2 - OCB A-386 OPERATION</b>		

8.6.2 Manually operate the directional instantaneous overcurrent element on the **67GB-86** directional ground overcurrent relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>67GB-86 DIRECTIONAL GROUND OVERCURRENT RELAY (DIRECTIONAL INSTANTANEOUS OVERCURRENT ELEMENT)</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
A-386		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
<b>W2 - OCB A-386 OPERATION</b>		

**8.7 Establish SEL PRTU Communications**

8.7.1 Establish and verify communications with the SEL PRTU Relay utilizing a personal computer (PC).

**8.8 230 kV A-386 SEL 121G-5 Line Relaying Trip Testing**

**NOTE: OCB A-386 WILL OPEN AFTER EACH STEP IN THIS SECTION. CLOSE OCB A-386 AND RESET ANY ANNUNCIATORS AFTER THE COMPLETION OF EACH STEP.**

8.8.1 Simulate an SEL TRIP contact closure by placing a jumper across terminals 13 and 14 of the Set #1 SEL Relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

<b>SEL 121G-5 RELAY SET #1 -- TRIP CONTACT</b>		
<b>TRIPS</b>	<b>Verify by placing a check below</b>	<b>RECORD SCADA ALARMS BELOW</b>
A-386		
<b>LOCAL ANNUNCIATION</b>	<b>Verify by placing a check below</b>	
<b>W2 - OCB A-386 OPERATION</b>		

8.8.2 Simulate an SEL TRIP contact closure by placing a jumper across terminals 13 and 14 of the Set #2 SEL Relay -- verify target operation and the following trips and annunciation. Also record the SCADA alarms in the column below.

SEL 121G-5 RELAY SET #2 -- TRIP CONTACT		
TRIPS	Verify by placing a check below	RECORD SCADA ALARMS BELOW
A-386		
LOCAL ANNUNCIATION	Verify by placing a check below	
W2 - OCB A-386 OPERATION		

**8.9 Local Trip Tests Acceptance**

8.9.1 The **Lead Relay Technician** and **EUE System Protection Engineer** shall sign below indicating tests have been completed successfully.

\_\_\_\_\_  
Lead Relay Technician

\_\_\_\_\_  
Date

\_\_\_\_\_  
EUE System Protection Engineer

\_\_\_\_\_  
Date



**9.0 A-386/MIDWAY  $\mu$ WAVE TRIP TEST**

THIS SECTION WILL BE PERFORMED DURING WHC-SD-LL-ATP-023 (A-382 ATP).

**10.0 DISCREPANCIES**

Discrepancies and their corrective actions shall be listed on the following page. Make additional sheets if needed.

**Comments, Discrepancies and Resolutions**

STEP #	