



# TRANSFORMER MAINTENANCE TEST



CUSTOMER Powerlogics, Inc. PAGE 195  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 1/11/2014 AMBIENT TEMPERATURE 80 °F HUMIDITY 98 % EQPT. LOCATION MEP  
 SUBSTATION US-9 POSITION US-9

### NAMEPLATE DATA

MANUFACTURER Square D YR MFR 12/97 SERIAL NO. 960316-A1  
 IMPEDANCE 5.84 % CAPACITY \_\_\_\_\_ GALLONS TYPE N/A CLASS OA / /  
 KVA 1,500 / / WINDING MATERIAL ALUMINUM TEMPERATURE RISE 65 °C B.I.L. RATING 95  
 PRIMARY KV 12,470   $\triangle$    $\triangle$    $\triangle$  DELTA  
 SECONDARY KV 480 / 277   $\triangle$    $\triangle$    $\triangle$  WYE  
 TAP VOLTAGES 13,094 12,782 12,470 12,158 11,847 INSULATING MEDIUM Mineral Oil  
 TAP POSITION A B C D E TANK TYPE Free Breathing  
 TAP SETTING C 12,470 VOLTS DRY TYPE  CONSERVATOR

### VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	
VERIFY FANS OPERATE	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

### ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 KVA)

#### MAINTENANCE

INSULATION RESISTANCE IN MEGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	5	1	5
0.50	8G	8G	10G
1.00	9.5G	11G	11.5G
10.00	12G	12G	13G
P. I.			

P.I. = 10 min/1 min

#### ACCEPTANCE

WINDING RESISTANCE TEST IN OHMS			
H1-H2	<u>N/A</u>	X0-X2	<u>N/A</u>
H2-H3	<u>N/A</u>	X0-X3	<u>N/A</u>
H3-H1	<u>N/A</u>	X0-X1	<u>N/A</u>

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
C	45.018	45.074	45.076	45.057

WORKING TAP AF C AL C

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. 5kV Megger, 3 PH TTR

TESTED BY: Billy Davis



# LOADBREAK DISCONNECT TEST



CUSTOMER Powerlogics, Inc. PAGE 196  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 1/10/2014 AMBIENT TEMPERATURE 75 °F HUMIDITY 95 % EQPT. LOCATION MEP  
 SUBSTATION US-9 POSITION US-9

### FUSE DATA

MANUFACTURER Square D TYPE HUI HOLDER N/A MAX. AMPS 600  
 REFILL ELEMENT TYPE N/A SIZE 125 CAT. NO. N/A TCC NO. N/A VOLTAGE 12.47 kV

### NAMEPLATE DATA

MANUFACTURER Square D SERIAL NO. 44036-325-50  
 VOLTAGE 15kV TYPE Knife Switch AMPERES 600 INTERRUPTING RATING 65 kA  
 TYPE OPERATING MECHANISM N/A AGE 10/97 B.I.L. RATING 15 kV  
 MOMENTARY FAULT CLOSING AMPS 61 kA OTHER NAMEPLATE DATA N/A

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input checked="" type="checkbox"/>	Good	
INSULATING MEMBERS	<input checked="" type="checkbox"/>	Good	
MECHANICAL CONNECTION	<input checked="" type="checkbox"/>	Good	
STRUCTURAL MEMBERS	<input checked="" type="checkbox"/>	Good	
CUBICLE	<input checked="" type="checkbox"/>	Good	
AUXILIARY DEVICES	<input type="checkbox"/>		

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
MAIN CONTACTS	<input checked="" type="checkbox"/>	Good	
HEATERS	<input type="checkbox"/>		
BEARINGS	<input type="checkbox"/>		
CONTACT SEQUENCE	<input type="checkbox"/>		
GROUND CONNECTION	<input checked="" type="checkbox"/>	Good	

INSULATION TEST VOLTAGE 5,000 KVDC TEST VOLTAGE MULTIPLIER, K1 = 1 K2 = (K1) (TCF)  
 EQUIPMENT TEMPERATURE 20 °C TEMPERATURE CORRECTION FACTOR TO 20°C, TCF 1

### INSULATION TESTS

	RANGE MULTIPLIER	K2	POLE 1 (P1-P2)		POLE 2 (P2-P3)		POLE 3 (P1-P3)	
			READING	20°C	READING	20°C	READING	20°C
POLE TO POLE	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
POLE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LOAD TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO LOAD	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0

### CONTACT MEASUREMENTS

	POLE 1	POLE 2	POLE 3
ARCING CONTACT WIPE - INCHES			
MAIN CONTACT WIPE - INCHES			
MAIN CONTACT GAP - INCHES			
MAIN CONTACT TRAVEL INCHES			

	POLE 1	POLE 2	POLE 3	
CONTACT RESISTANCE MICRO-OHMS	RDG.	31	42	38
	20°C	31.00	42.00	38.00
OPENING SPEED (ft/sec)				
CLOSING SPEED (ft/sec)				

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. 5kV Megger, AEMC DLRO TESTED BY: Billy Davis



# TRANSFORMER MAINTENANCE TEST



CUSTOMER Powerlogics, Inc. PAGE 197  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION Transformer T-5

### NAMEPLATE DATA

MANUFACTURER GE YR MFR N/A SERIAL NO. M126544  
 IMPEDANCE 5.58 % CAPACITY            GALLONS TYPE DRY CLASS AA / /  
 KVA 1,000 / / WINDING MATERIAL            TEMPERATURE RISE 150 °C B.I.L. RATING 95  
 PRIMARY KV 12,470   $\Delta$    $\triangleleft$    $\triangle$  DELTA  
 SECONDARY KV 480 / 277   $\Delta$    $\triangleleft$    $\triangle$  WYE  
 TAP VOLTAGES 13,090 12,780 12,470 12,160 11,850 INSULATING MEDIUM             
 TAP POSITION A-B B-C C-D D-E E-F TANK TYPE Free Breathing  
 TAP SETTING C-D 12,470 VOLTS DRY TYPE  CONSERVATOR

### VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	
VERIFY FANS OPERATE	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

### ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 KVA)

#### MAINTENANCE

INSULATION RESISTANCE IN MEGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	5	1	2,500
0.50	4003	41000	37000
1.00	4730	60000	44000
10.00	8220	102000	70400
P. I.	1.73784	1.7	1.6

P.I. = 10 min/1 min

#### ACCEPTANCE

WINDING RESISTANCE TEST IN OHMS			
H1-H2	<u>N/A</u>	X0-X2	<u>N/A</u>
H2-H3	<u>N/A</u>	X0-X3	<u>N/A</u>
H3-H1	<u>N/A</u>	X0-X1	<u>N/A</u>

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
C-D	45.018	45.337	45.376	45.327

WORKING TAP AF C-D AL C-D

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. AEMC Megger, TTR, Winding Resistance Test Set

TESTED BY: Andrew Thomas



# TRANSFORMER MAINTENANCE TEST



CUSTOMER Powerlogics, Inc. PAGE 198  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION Transformer T-6

### NAMEPLATE DATA

MANUFACTURER Federal Pacific YR MFR N/A SERIAL NO. 28021-001  
 IMPEDANCE 6.35 % CAPACITY                      GALLONS TYPE                      CLASS                       
 KVA 1,000 / / WINDING MATERIAL                      TEMPERATURE RISE 150 °C B.I.L. RATING 95  
 PRIMARY KV 12,470      DELTA  
 SECONDARY KV 480 / 277      WYE  
 TAP VOLTAGES 13,150 12,810 12,470 12,120 11,770 INSULATING MEDIUM                       
 TAP POSITION 2-3 3-4 4-5 5-6 6-7 TANK TYPE Free Breathing  
 TAP SETTING 4-5 12,470 VOLTS DRY TYPE  CONSERVATOR

### VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	
VERIFY FANS OPERATE	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

### ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 KVA)

#### MAINTENANCE

INSULATION RESISTANCE IN MEGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	5,000	1,000	2,500
0.50	27730	200000	3700
1.00	49100	202000	4600
10.00	104600	200000	93200
P. I.	2.13035	0.990099	20.2609

P.I. = 10 min/1 min

#### ACCEPTANCE

WINDING RESISTANCE TEST IN OHMS			
H1-H2	<u>N/A</u>	X0-X2	<u>N/A</u>
H2-H3	<u>N/A</u>	X0-X3	<u>N/A</u>
H3-H1	<u>N/A</u>	X0-X1	<u>N/A</u>

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	45.018	45.106	45.096	45.103

WORKING TAP AF 4-5 AL 4-5

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. AEMC Megger, TTR, Winding Resistance Test Set

TESTED BY: Andrew Thomas



# TRANSFORMER MAINTENANCE TEST



CUSTOMER Powerlogics, Inc. PAGE 199  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION Transformer T-7

### NAMEPLATE DATA

MANUFACTURER Federal Pacific YR MFR N/A SERIAL NO. 28022-001  
 IMPEDANCE 5.28 % CAPACITY            GALLONS TYPE            CLASS            /            /             
 KVA            / 300 /            WINDING MATERIAL            TEMPERATURE RISE 150 °C B.I.L. RATING 95  
 PRIMARY KV 12,470      DELTA  
 SECONDARY KV 480 / 277      WYE  
 TAP VOLTAGES 13,138 12,810 12,470 12,120 11,770 INSULATING MEDIUM             
 TAP POSITION 2-3 3-4 4-5 5-6 6-7 TANK TYPE Free Breathing  
 TAP SETTING 4-5 12,470 VOLTS DRY TYPE  CONSERVATOR

### VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	
VERIFY FANS OPERATE	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

### ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 KVA)

#### MAINTENANCE

INSULATION RESISTANCE IN MEGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	5	1	2.5
0.50	26090	32000	26030
1.00	39580	54200	37300
10.00	72600	83320	81410
P. I.	1.83426	1.53727	2.18257

P.I. = 10 min/1 min

#### ACCEPTANCE

WINDING RESISTANCE TEST IN OHMS			
H1-H2	<u>N/A</u>	X0-X2	<u>N/A</u>
H2-H3	<u>N/A</u>	X0-X3	<u>N/A</u>
H3-H1	<u>N/A</u>	X0-X1	<u>N/A</u>

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	45.018	45.069	45.110	45.082

WORKING TAP AF 4-5 AL 4-5

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. AEMC Megger, TTR, Winding Resistance Test Set

TESTED BY: Andrew Thomas



# LOADBREAK DISCONNECT TEST



CUSTOMER Powerlogics, Inc. PAGE 200  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION West Wing Feeder #1 T-6

### FUSE DATA

MANUFACTURER Power Gard Products TYPE E HOLDER Clip MAX. AMPS 65  
 REFILL ELEMENT TYPE \_\_\_\_\_ SIZE 65E CAT. NO. 65E-2C-15.5 TCC NO. \_\_\_\_\_ VOLTAGE 15.5 kV

### NAMEPLATE DATA

MANUFACTURER Federal Pacific SERIAL NO. 2658D2430  
 VOLTAGE 13.8 kV TYPE LI AMPERES 600 INTERRUPTING RATING 40 kA  
 TYPE OPERATING MECHANISM Mechanical AGE N/A B.I.L. RATING 95 kV  
 MOMENTARY FAULT CLOSING AMPS \_\_\_\_\_ kA OTHER NAMEPLATE DATA \_\_\_\_\_

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input type="checkbox"/>		
INSULATING MEMBERS	<input type="checkbox"/>		
MECHANICAL CONNECTION	<input type="checkbox"/>		
STRUCTURAL MEMBERS	<input type="checkbox"/>		
CUBICLE	<input type="checkbox"/>		
AUXILIARY DEVICES	<input type="checkbox"/>		

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
MAIN CONTACTS	<input type="checkbox"/>		
HEATERS	<input type="checkbox"/>		
BEARINGS	<input type="checkbox"/>		
CONTACT SEQUENCE	<input type="checkbox"/>		
GROUND CONNECTION	<input type="checkbox"/>		

INSULATION TEST VOLTAGE 5 KVDC TEST VOLTAGE MULTIPLIER, K1 = 1 K2 = (K1) (TCF)  
 EQUIPMENT TEMPERATURE 20 °C TEMPERATURE CORRECTION FACTOR TO 20°C, TCF 1

### INSULATION TESTS

	RANGE MULTIPLIER	K2	POLE 1 (P1-P2)		POLE 2 (P2-P3)		POLE 3 (P1-P3)	
			READING	20°C	READING	20°C	READING	20°C
POLE TO POLE	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
POLE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LOAD TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO LOAD	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0

### CONTACT MEASUREMENTS

	POLE 1	POLE 2	POLE 3
ARCING CONTACT WIPE - INCHES			
MAIN CONTACT WIPE - INCHES			
MAIN CONTACT GAP - INCHES			
MAIN CONTACT TRAVEL INCHES			

	POLE 1	POLE 2	POLE 3	
CONTACT RESISTANCE MICRO-OHMS	RDG.	85	78	83
	20°C	85.00	78.00	83.00
OPENING SPEED (ft/sec)				
CLOSING SPEED (ft/sec)				

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. AEMC DLRO, AEMC Megger

TESTED BY: Andrew Thomas



# LOADBREAK DISCONNECT TEST



CUSTOMER Powerlogics, Inc. PAGE 201  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION West Wing Feeder #1 T-7

### FUSE DATA

MANUFACTURER \_\_\_\_\_ TYPE \_\_\_\_\_ HOLDER \_\_\_\_\_ MAX. AMPS \_\_\_\_\_  
 REFILL ELEMENT TYPE \_\_\_\_\_ SIZE \_\_\_\_\_ CAT. NO. \_\_\_\_\_ TCC NO. \_\_\_\_\_ VOLTAGE \_\_\_\_\_ kV

### NAMEPLATE DATA

MANUFACTURER Federal Pacific SERIAL NO. 2658D2430  
 VOLTAGE 13.8 kV TYPE LI AMPERES 600 INTERRUPTING RATING 40 kA  
 TYPE OPERATING MECHANISM Mechanical AGE N/A B.I.L. RATING 95 kV  
 MOMENTARY FAULT CLOSING AMPS \_\_\_\_\_ kA OTHER NAMEPLATE DATA \_\_\_\_\_

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input type="checkbox"/>		
INSULATING MEMBERS	<input type="checkbox"/>		
MECHANICAL CONNECTION	<input type="checkbox"/>		
STRUCTURAL MEMBERS	<input type="checkbox"/>		
CUBICLE	<input type="checkbox"/>		
AUXILIARY DEVICES	<input type="checkbox"/>		

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
MAIN CONTACTS	<input type="checkbox"/>		
HEATERS	<input type="checkbox"/>		
BEARINGS	<input type="checkbox"/>		
CONTACT SEQUENCE	<input type="checkbox"/>		
GROUND CONNECTION	<input type="checkbox"/>		

INSULATION TEST VOLTAGE 5 KVDC TEST VOLTAGE MULTIPLIER, K1 = 1 K2 = (K1) (TCF)  
 EQUIPMENT TEMPERATURE 20 °C TEMPERATURE CORRECTION FACTOR TO 20°C, TCF 1

### INSULATION TESTS

	RANGE MULTIPLIER	K2	POLE 1 (P1-P2)		POLE 2 (P2-P3)		POLE 3 (P1-P3)	
			READING	20°C	READING	20°C	READING	20°C
POLE TO POLE	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
POLE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LOAD TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO LOAD	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0

### CONTACT MEASUREMENTS

	POLE 1	POLE 2	POLE 3
ARCING CONTACT WIPE - INCHES			
MAIN CONTACT WIPE - INCHES			
MAIN CONTACT GAP - INCHES			
MAIN CONTACT TRAVEL INCHES			

	POLE 1	POLE 2	POLE 3	
CONTACT RESISTANCE MICRO-OHMS	RDG.	340	220	278
	20°C	340.00	220.00	278.00
OPENING SPEED (ft/sec)				
CLOSING SPEED (ft/sec)				

COMMENTS:

DEFICIENCIES:

EQPT. INVENTORY NO. AEMC DLRO, AEMC Megger TESTED BY: Andrew Thomas



# LOADBREAK DISCONNECT TEST



CUSTOMER Powerlogics, Inc. PAGE 202  
 ADDRESS 5942 Frond Way; Apollo Beach FL 33572 JOB # 13-320  
 USER Malcom Randall VA Hospital; 1601 SW Archer Road; Gainesville FL 32608  
 OWNER REPRESENTATIVE Barbara Smith TELEPHONE 813-645-2971  
 DATE 2/15/2014 AMBIENT TEMPERATURE 36 °F HUMIDITY 70 % EQPT. LOCATION EB-66  
 SUBSTATION West Wing SWBD POSITION West Wing Feeder #2 T-6

### FUSE DATA

MANUFACTURER \_\_\_\_\_ TYPE \_\_\_\_\_ HOLDER \_\_\_\_\_ MAX. AMPS \_\_\_\_\_  
 REFILL ELEMENT TYPE \_\_\_\_\_ SIZE \_\_\_\_\_ CAT. NO. \_\_\_\_\_ TCC NO. \_\_\_\_\_ VOLTAGE \_\_\_\_\_ kV

### NAMEPLATE DATA

MANUFACTURER Federal Pacific SERIAL NO. 2658D2430  
 VOLTAGE 13.8 kV TYPE LI AMPERES 600 INTERRUPTING RATING 40 kA  
 TYPE OPERATING MECHANISM Mechanical AGE N/A B.I.L. RATING 95 kV  
 MOMENTARY FAULT CLOSING AMPS \_\_\_\_\_ kA OTHER NAMEPLATE DATA \_\_\_\_\_

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
OVERALL CLEANLINESS	<input type="checkbox"/>		
INSULATING MEMBERS	<input type="checkbox"/>		
MECHANICAL CONNECTION	<input type="checkbox"/>		
STRUCTURAL MEMBERS	<input type="checkbox"/>		
CUBICLE	<input type="checkbox"/>		
AUXILIARY DEVICES	<input type="checkbox"/>		

DESCRIPTION	INSPECTED	CONDITION	CLEAN/LUBE
MAIN CONTACTS	<input type="checkbox"/>		
HEATERS	<input type="checkbox"/>		
BEARINGS	<input type="checkbox"/>		
CONTACT SEQUENCE	<input type="checkbox"/>		
GROUND CONNECTION	<input type="checkbox"/>		

INSULATION TEST VOLTAGE 5 KVDC TEST VOLTAGE MULTIPLIER, K1 = 1 K2 = (K1) (TCF)  
 EQUIPMENT TEMPERATURE 20 °C TEMPERATURE CORRECTION FACTOR TO 20°C, TCF 1

INSULATION TESTS	RANGE MULTIPLIER	K2	POLE 1 (P1-P2)		POLE 2 (P2-P3)		POLE 3 (P1-P3)	
			READING	20°C	READING	20°C	READING	20°C
POLE TO POLE	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
POLE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LOAD TO FRAME	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0
LINE TO LOAD	1.000	1.000	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0	200,000.0

CONTACT MEASUREMENTS	POLE 1	POLE 2	POLE 3
	ARCING CONTACT WIPE - INCHES		
MAIN CONTACT WIPE - INCHES			
MAIN CONTACT GAP - INCHES			
MAIN CONTACT TRAVEL INCHES			

CONTACT RESISTANCE MICRO-OHMS	RDG.	POLE 1	POLE 2	POLE 3
	20°C	97.00	86.00	92.00

OPENING SPEED (ft/sec)	POLE 1	POLE 2	POLE 3

CLOSING SPEED (ft/sec)	POLE 1	POLE 2	POLE 3

COMMENTS:   
 DEFICIENCIES:

EQPT. INVENTORY NO. AEMC DLRO, AEMC Megger TESTED BY: Andrew Thomas





# Comment and Deficiency Summary Job #13-320



Customer Powerlogics, Inc.  
User Malcom Randall VA Hospital

Plant: <u>&lt;None&gt;</u>	Page: <u>13</u>
Substation: <u>Bed Tower US-1 Switchboard</u>	Date: <u>1/5/2014</u>
Position: <u>Main</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Tested @ 0.5, LTD Tested @1, GFD Tested @ .2</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>20</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>ATS-CR</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ 1</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>21</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>ATS-EQ</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Tested @ 1</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>22</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>ATS-LS</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay tested @ 0.5</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>23</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>DP-1</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ 1</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: <u>24</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>DP-P</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ 1</u>	

Plant: <None>	Page: <u>25</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>Main</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Tested @ 0.5, LTD Tested @1, GFD Tested @ .2</u>	

Plant: <None>	Page: <u>30</u>
Substation: <u>Bed Tower US-2 Switchboard</u>	Date: <u>1/4/2014</u>
Position: <u>Tie</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Tested @ 0.5, LTD Tested @1, GFD Tested @ .2</u>	

Plant: <None>	Page: <u>47</u>
Substation: <u>E-Wing</u>	Date: <u>2/15/2014</u>
Position: <u>Main</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Deficiencies: <u>Breaker would not trip on any function. It is defective.</u>	

Plant: <None>	Page: <u>48</u>
Substation: <u>E-Wing</u>	Date: <u>2/15/2014</u>
Position: <u>MCC-N</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>I tested LT function. Had trouble reclosing breaker so I didnt test other functions.</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 49
Substation: E-Wing	Date: 2/15/2014
Position: NF 2	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
<b>Comments:</b> LTPU was tested @ 0.5 LTPU Delay was tested @ MIN	

Plant: <None>	Page: 58
Substation: Gen Panel	Date: 1/25/2014
Position: TS-Q	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
<b>Comments:</b> LTD was tested @ 2	

Plant: <None>	Page: 65
Substation: Generator Gear	Date: 1/11/2014
Position: Generator #2	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
<b>Comments:</b> Ground Fault was not wired in.	

Plant: <None>	Page: 66
Substation: Generator Gear	Date: 1/11/2014
Position: Generator #3	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
<b>Comments:</b> Trip unit has override function that makes time run longer.	

Plant: <None>	Page: 71
Substation: MSGR-A	Date: 1/18/2014
Position: ATS Standby 1 Breaker	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
<b>Comments:</b> LTD was tested @ 2	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 72
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-EC3 Breaker</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 73
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-EQ Breaker</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 74
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-EQ2 Breaker</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 75
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>Future #1</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT PU was Tested @ .5 LTD was tested @ 2</u>	

Plant: <None>	Page: 76
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>Main</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 1 LT was Tested @ .4</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 77
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>MCC-PH-3</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT PU was Tested @ .5 LTD was tested @ 2</u>	

Plant: <None>	Page: 78
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>PBCNA</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 79
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>Trane Chiller #2</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 80
Substation: <u>MSGR-A</u>	Date: <u>1/18/2014</u>
Position: <u>Trans Chiller #1</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <None>	Page: 82
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-EC2</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 83
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-ECI</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: 84
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>ATS-LS</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: 85
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>BC.N. DPA</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: 86
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>BC-N-DPB</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: 87
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>BNDP</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: <u>88</u>
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>DH-2-BA</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: <u>89</u>
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>DH3BD</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: <u>90</u>
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>DH-3-BP</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: <u>91</u>
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>Future #2</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: <u>92</u>
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>Future #3</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 93
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>Main Breaker</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .4 Setting</u>	

Plant: <None>	Page: 94
Substation: <u>MSGR-B</u>	Date: <u>1/18/2014</u>
Position: <u>PB PN A</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LT Delay Tested @ .1 Setting</u>	

Plant: <None>	Page: 96
Substation: <u>MSGR-B, MSGR-A</u>	Date: <u>1/17/2014</u>
Position: <u>TIE</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>Tested @ .4 Setting</u>	

Plant: <None>	Page: 98
Substation: <u>MV-SWGR-A</u>	Date: <u>2/15/2014</u>
Position: <u>E-WING Feeder #1</u>	
Equipment: <u>45000 - OVERCURRENT RELAY</u>	
Comments: <u>Reprogrammed relay to trip breaker on instantaneous.</u>	
Deficiencies: <u>Relay would not trip breaker on instantaneous.</u>	

Plant: <None>	Page: 101
Substation: <u>MV-SWGR-A</u>	Date: <u>2/15/2014</u>
Position: <u>Main Breaker</u>	
Equipment: <u>45000 - OVERCURRENT RELAY</u>	
Comments: <u>Reprogrammed relay to trip breaker.</u>	
Deficiencies: <u>Relay would not trip breaker.</u>	





# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 103
Substation: MV-SWGR-A	Date: 2/15/2014
Position: Tie Breaker	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reprogrammed relay to trip breaker.	
Deficiencies: Relay would not trip breaker.	

Plant: <None>	Page: 105
Substation: MV-SWGR-A	Date: 1/18/2014
Position: TX MSGR-A Feeder	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reprogrammed relay to trip breaker.	
Deficiencies: Relay would not trip breaker.	

Plant: <None>	Page: 109
Substation: MV-SWGR-B	Date: 2/15/2014
Position: E-WING Feeder #2	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reprogrammed relay to trip breaker on instantaneous.	
Deficiencies: Relay would not trip breaker on instantaneous.	

Plant: <None>	Page: 111
Substation: MV-SWGR-B	Date: 1/18/2014
Position: Main Breaker	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reprogrammed relay to trip breaker.	
Deficiencies: Relay does not trip Main Breaker.	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 113
Substation: MV-SWGR-B	Date: 1/18/2014
Position: TX MSGR-B Feeder	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reprogrammed relay to trip breaker.	
Deficiencies: Relay would not trip breaker.	

Plant: <None>	Page: 117
Substation: Normal Sub	Date: 1/17/2014
Position: Main	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Devector Trip Unit.	

Plant: <None>	Page: 120
Substation: Normal Sub	Date: 1/17/2014
Position: Riser Panel L1N, 1L, L2N, L3N	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Breaker will not trip due to defective actuator.	

Plant: <None>	Page: 126
Substation: North 15kv Switchgear	Date: 1/19/2014
Position: Full Power Backup Tie Breaker	
Equipment: 45000 - OVERCURRENT RELAY	
Deficiencies: Found Shorting Screws in shorting Blocks, Disabling Breaker.	

Plant: <None>	Page: 129
Substation: North 15kv Switchgear	Date: 1/11/2014
Position: Main Breaker	
Equipment: 16100 - VACUUM CIRCUIT BREAKER	
Comments: Replaced with Spare #1	
Deficiencies: Contact resistance more than 50% higher than each adjacent phase	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 134
Substation: North 15kv Switchgear	Date: 1/4/2014
Position: US-1/US-2 Feeder	
Equipment: 45000 - OVERCURRENT RELAY	
Comments: Reset Secondary to 5 amps.	
Deficiencies: Relay was set to 1 Amp Secondary Current	

Plant: <None>	Page: 152
Substation: US-10	Date: 1/12/2014
Position: Chiller #3	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	

Plant: <None>	Page: 153
Substation: US-10	Date: 1/12/2014
Position: Chiller #4	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	

Plant: <None>	Page: 154
Substation: US-10	Date: 1/12/2014
Position: DP-1CH	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	

Plant: <None>	Page: 155
Substation: US-10	Date: 1/12/2014
Position: DPZCH	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	



# Comment and Deficiency Summary

## Job #13-320



Plant: <u>&lt;None&gt;</u>	Page: <u>156</u>
Substation: <u>US-10</u>	Date: <u>1/11/2014</u>
Position: <u>Main</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD tested @ 2.</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>157</u>
Substation: <u>US-10</u>	Date: <u>1/11/2014</u>
Position: <u>Spare</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>LTD was tested @ 2</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>162</u>
Substation: <u>US-4</u>	Date: <u>1/11/2014</u>
Position: <u>ATS-LS2</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Deficiencies: <u>Charged indicator was defective.</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>164</u>
Substation: <u>US-4</u>	Date: <u>1/4/2014</u>
Position: <u>Main 52-1</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Comments: <u>The ground fault is not hooked up.</u>	

Plant: <u>&lt;None&gt;</u>	Page: <u>167</u>
Substation: <u>US-4</u>	Date: <u>1/11/2014</u>
Position: <u>Panel ALIB</u>	
Equipment: <u>15000 - LOW VOLT. PWR. CKT. BKR. TEST</u>	
Deficiencies: <u>Charged indicator is defective.</u>	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 168
Substation: US-4	Date: 1/11/2014
Position: Tie 52-TI	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Charged indicator is defective. Ground Fault is not hooked up.	

Plant: <None>	Page: 172
Substation: US-5	Date: 1/11/2014
Position: ATS-EQ3A	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Charged indicator is defective.	

Plant: <None>	Page: 174
Substation: US-5	Date: 1/4/2014
Position: Main 52-5	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: The ground fault is not hooked up.	

Plant: <None>	Page: 177
Substation: US-5	Date: 1/11/2014
Position: Panel ALGA	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Charged indicator is defective.	

Plant: <None>	Page: 179
Substation: US-5	Date: 1/11/2014
Position: Tie 52-T2	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Ground Fault was not hooked up	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 182
Substation: US-8	Date: 1/11/2014
Position: Chiller #1 (MEP)(Spare)	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD was tested @ 2	

Plant: <None>	Page: 183
Substation: US-8	Date: 1/11/2014
Position: Generator Backup #2	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Defective trip unit	

Plant: <None>	Page: 184
Substation: US-8	Date: 1/11/2014
Position: Main Breaker	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: Trip unit has override function that runs time longer. Ground fault was not wired in.	
Deficiencies: Actuator hanging up, will not close every time.	

Plant: <None>	Page: 187
Substation: US-8	Date: 1/11/2014
Position: MEP-EQ3	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	

Plant: <None>	Page: 188
Substation: US-8	Date: 1/11/2014
Position: Old #2 Chiller Feeder (Spare)	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	



# Comment and Deficiency Summary Job #13-320



Plant: <None>	Page: 189
Substation: US-8	Date: 1/11/2014
Position: Panel MLGA	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Charged Flag is out of adjustment.	

Plant: <None>	Page: 190
Substation: US-8	Date: 1/11/2014
Position: Spare #1	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Deficiencies: Defective trip unit	

Plant: <None>	Page: 191
Substation: US-8	Date: 1/11/2014
Position: Tie (Spare)	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: Breaker will not trip.	
Deficiencies: Defective trip unit	

Plant: <None>	Page: 194
Substation: US-9	Date: 1/11/2014
Position: Chiller #5	
Equipment: 15000 - LOW VOLT. PWR. CKT. BKR. TEST	
Comments: LTD tested @ 2.	

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/12/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 1 Group 1	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325069			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: Gen 1 300G TOC	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36 MONTHS		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="1"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$= "GENERATOR"	TID\$= "TERMINAL"	CTR= 40	
CTRD= 40	CTRN= 40	PTR= 103.90	
PTRN= 103.90	VNOM= 120.0	INOM= 2.9	
EBUP\$= "V"	E24\$= "Y"	E27\$= "Y"	
E32\$= "Y"	E40\$= "Y"	E46\$= "Y"	
E50\$= "Y"	E50_87\$= "N"	E51\$= "Y"	
E59\$= "Y"	E64\$= "Y"	E78\$= "1B"	
E81= 1	E81AC= 6	E87\$= "N"	
ESV= 6	ESL= 5	EDEM\$= "ROL"	
s24D1P= 105	s24D1D= 1.00	s24CCS\$= "ID"	
s24IP= 105	s24IC= 2.0	s24ITD= 0.1	
s24D2P2= 176	s24D2D2= 3.00	s24CR= 240.00	
s24TC\$= "!60LOP"	s27P1P= 54.0	s27P2P\$= "OFF"	
s27V1P\$= "OFF"	s27PP1= 93.5	s27PP2= 93.5	
s32P1P= -0.0500	s32P1D= 20.00	s32P2P= -0.1000	
s32P2D= 5.00	s32PTC\$= "!60LOP"	s40Z1P= 13.4	
s40XD1= -2.5	s40Z1D= 0.00	s40Z2P= 25.0	
s40XD2= -2.5	s40Z2D= 0.50	s40ZTC\$= "!60LOP"	
s46Q1P= 8	s46Q1D= 30.00	s46Q2P= 8	
s46Q2K= 10	s46QTC= 1	s50P1P= 37.50	
s50P1D= 0.00	s50P2P\$= "OFF"	s50N1P\$= "OFF"	



Relay Results (continued) for: SEL-300G.FST2510412122013AL

s50N2P\$=	"OFF"	s50G1P=	3.00	s50G1D=	0.00
s50G2P\$=	"OFF"	s51NP=	1.00	s51NC\$=	"U2"
s51NTD=	5.00	s51NRS\$=	"N"	s51NTC=	1
s51GP\$=	"OFF"	s51VCA=	0	s51VP=	4.35
s51VC\$=	"U1"	s51VTD=	6.70	s51VRS\$=	"N"
s51VTC\$=	"!60LOP"	s3POD=	0.00	s50LP=	0.25
s52A\$=	"IN101"	s59P1P=	135.0	s59P2P\$=	"OFF"
s59G1P=	135.0	s59G2P\$=	"OFF"	s59QP\$=	"OFF"
s59V1P\$=	"OFF"	s59PP1\$=	"OFF"	s59PP2\$=	"OFF"
s64G1P=	5.0	s64G1D=	2.00	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	2.00	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"50P1T + 51VT + 87U +
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
			+ /64G2 + /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND + /BNDT + /INAD"	OUT101\$=	"SV3"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)	SCEUSE"				
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50
IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"

SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSCST\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSCST\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSCST\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

**Relay Test Results for:** RELAY STATUS CHECK

GENERATOR DATE: 12/12/13 TIME: 12:28:23.694  
 TERMINAL  
 FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607 CID=E6A7  
 IA IB IC IN VA VB VC VN MOF  
 OS 1 -0 -0 -1 1 2 3 1 0  
 IA87 IB87 IC87  
 OS 1 -1 -1  
 +5V\_PS +5V\_REG -5V\_REG +12V\_PS -12V\_PS +15V\_PS -15V\_PS  
 PS 5.02 5.03 -5.02 11.99 -11.97 14.93 -15.18  
 TEMP RAM ROM A/D CR\_RAM EEPROM IO\_BRD  
 41.0 OK OK OK OK OK OK  
 41.0 OK OK OK OK OK OK

**Relay Test Results for:** METER TEST

	APPLIED	APPLIED	CURRENT				
	SEC VOLT	SEC AMP	PH LAG				
	69.28	2.00	30.00				
PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	PRI KV	PRI KV		PRI CUR	PRI CUR		
A-N	7.0	7.0	-0.0	72.0	72.1	0.1	PASS
B-N	7.2	7.2	0.0	80.0	80.1	0.1	PASS
C-N	7.4	7.4	-0.1	88.0	88.2	0.2	PASS
	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR		
	1.5	1.5	0.2	0.9	0.9	0.2	PASS

**Relay Test Results for:** 21C Z1C BSP REACH (21C1P)

OK?  
RAN

**Relay Test Results for:** 21C Z1CO BSP REACH (21C1P)

OK?  
RAN

**Relay Test Results for:** 21C 50PP1 PICKUP (50PP1)

OK?  
RAN

**Relay Test Results for:** 21C Z1CD BSP DELAY (21C1T)

OK?  
RAN

**Relay Test Results for:** 21C Z2C BSP REACH (21C2P)

OK?  
RAN

**Relay Test Results for:** 21C Z2CO BSP REACH (21C2P)

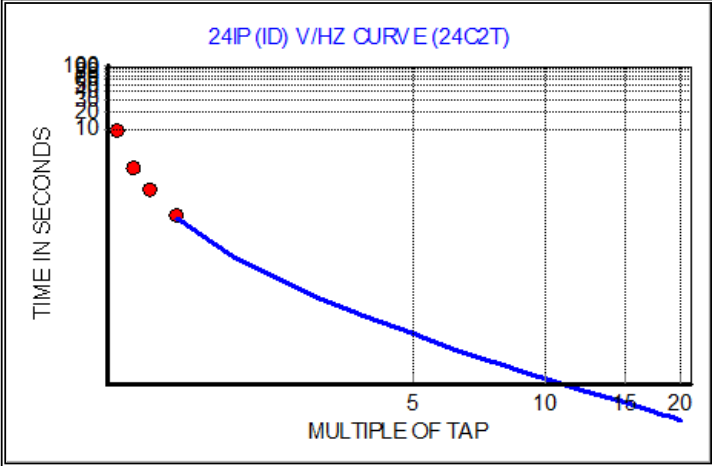
OK?  
RAN

**Relay Test Results for:** 21C 50PP2 PICKUP (50PP2)

OK?  
RAN

**Relay Test Results for:** 21C Z2CD BSP DELAY (21C2T)

OK?  
RAN

<b>Relay Test Results for:</b> 24D1P V/HZ PICKUP (24D1)						
	PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	126.000		126.000	0.00	PASS	
<b>Relay Test Results for:</b> 24D1D V/HZ DELAY (24D1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	151.200	62.77	1.046	0.925 TO 1.075	PASS	
<b>Relay Test Results for:</b> 24D2P1 V/HZ PICKUP (24C2)						
					OK?	RAN
<b>Relay Test Results for:</b> 24D2D1 V/HZ DELAY (24C2T)						
					OK?	RAN
<b>Relay Test Results for:</b> 24D2D2 V/HZ DELAY (24C2T)						
					OK?	RAN
<b>Relay Test Results for:</b> 24IP (I) V/HZ PICKUP (24C2)						
					OK?	RAN
<b>Relay Test Results for:</b> 24IP (I) V/HZ CURVE (24C2T)						
					OK?	RAN
<b>Relay Test Results for:</b> 24IP (ID) V/HZ PICKUP (24C2)						
	PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	126.000		126.000	0.00	PASS	
<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.10	138.600	578.98	9.650	9.475 TO 10.525	PASS	
1.20	151.200	149.42	2.490	2.350 TO 2.650	PASS	
1.30	163.800	68.18	1.136	1.031 TO 1.192	PASS	
1.50	189.000	26.56	0.443	0.355 TO 0.445	PASS	
						
<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)						
	PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	53.460		54.000	-1.00	PASS	
<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)						
					OK?	RAN

<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)							OK?
							RAN
<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)							OK?
	PICKUP	VOLTS	IDEAL	%ERROR			PASS
		53.982	53.982	-0.00			
<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)							OK?
	PICKUP	VOLTS	IDEAL	%ERROR			PASS
		53.982	53.982	-0.00			
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)							OK?
PHASE	PICKUP	CURRENT	IDEAL	%ERROR			PASS
3PH		0.145	0.145	0.34			
<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)							OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE			PASS
1.20	0.174	1201.88	20.031	18.975 TO 21.025			
<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)							OK?
PHASE	PICKUP	CURRENT	IDEAL	%ERROR			PASS
3PH		0.293	0.290	1.00			
<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)							OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE			PASS
1.20	0.348	302.02	5.034	4.725 TO 5.275			
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							OK?
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR		
270.00	34.641	2.200	15.744	15.900	-0.98	PASS	
300.00	34.641	2.698	12.840	12.839	0.01	PASS	
240.00	34.641	2.725	12.713	12.839	-0.98	PASS	
<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							OK?
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR		
270.00	34.641	13.856	2.500	2.500	0.00	PASS	
<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)							OK?
							RAN
<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)							OK?
	PICKUP	CURRENT	IDEAL	%ERROR			PASS
		0.703	0.696	0.96			
<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)							OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE			PASS
1.20	0.835	1802.99	30.050	28.450 TO 31.550			

<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
	0.696	0.696	-0.04	PASS		
<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
8.700	603.21	10.053	9.450 TO 10.550	PASS		
<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
4.350	2410.24	40.171	37.950 TO 42.050	PASS		
<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
A-N		37.876	37.500	1.00	PASS	
B-N		37.876	37.500	1.00	PASS	
C-N		37.876	37.500	1.00	PASS	
<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
50P1D OC DELAY (50P1T) (PHASE B-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.27	0.021	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE C-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.41	0.024	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE A-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.49	0.025	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
					OK?	RAN
<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
					OK?	RAN
<b>Relay Test Results for:</b> 50G1P OC PICKUP (50G1)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
	3.000	3.000	-0.00	PASS		
<b>Relay Test Results for:</b> 50G1D OC DELAY (50G1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	3.600	1.39	0.023	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50G2P OC PICKUP (50G2)						
					OK?	RAN
<b>Relay Test Results for:</b> 50G2D OC DELAY (50G2T)						
					OK?	RAN
<b>Relay Test Results for:</b> 51GP OC PICKUP (51G)						
					OK?	RAN
<b>Relay Test Results for:</b> 51G OC TIMING (51GT)						
					OK?	RAN

**Relay Test Results for:** 51CP OC PICKUP (51C)  
 OK?  
 RAN

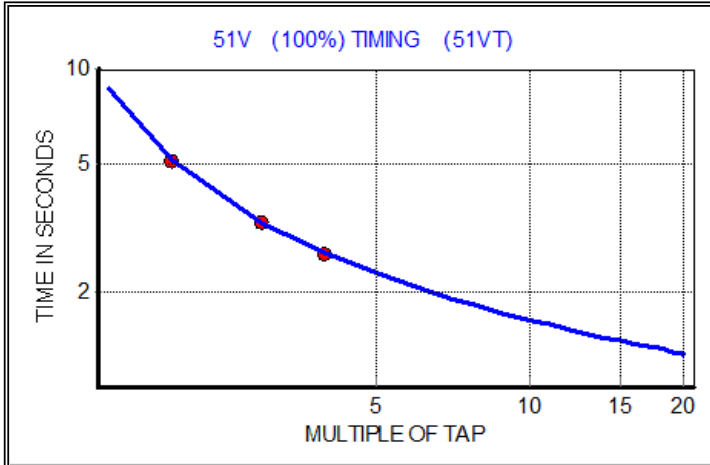
**Relay Test Results for:** 51C OC TIMING (51CT)  
 OK?  
 RAN

**Relay Test Results for:** 51VP (100%) PICKUP (51V)  
 PICKUP CURRENT IDEAL %ERROR OK?  
 4.349 4.350 -0.01 PASS

**Relay Test Results for:** 51VP (75%) PICKUP (51V)  
 PICKUP CURRENT IDEAL %ERROR OK?  
 3.262 3.263 -0.00 PASS

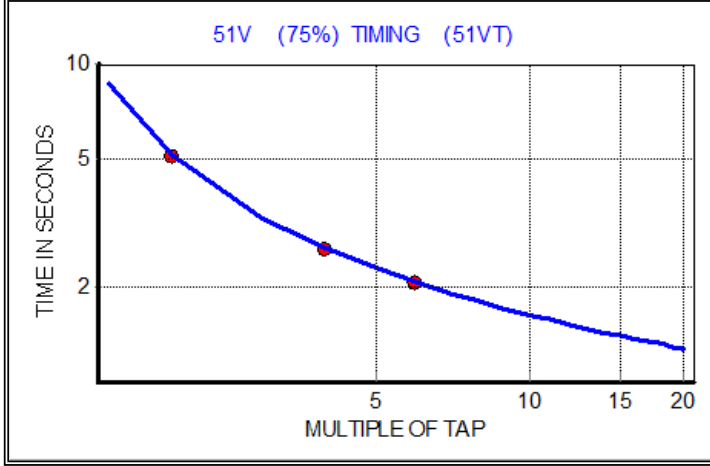
**Relay Test Results for:** 51V (100%) TIMING (51VT)

MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	8.700	307.76	5.129	5.143	-0.27	PASS
3.00	13.050	196.43	3.274	3.288	-0.43	PASS
4.00	17.400	157.42	2.624	2.630	-0.24	PASS



**Relay Test Results for:** 51V (75%) TIMING (51VT)

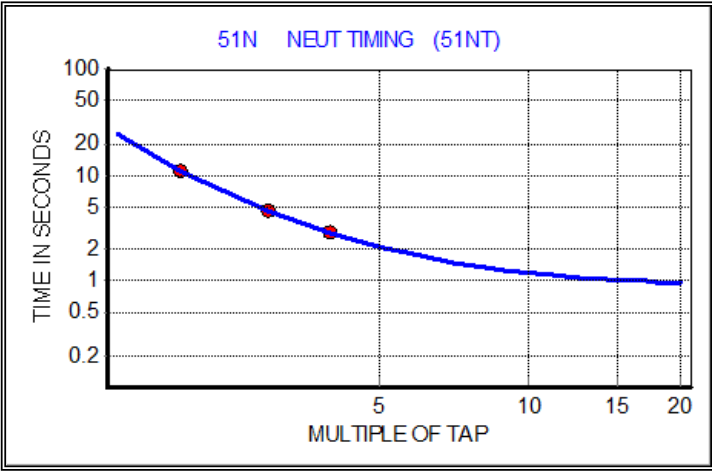
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	6.525	307.86	5.131	5.143	-0.23	PASS
4.00	13.050	157.23	2.620	2.630	-0.36	PASS
6.00	19.575	123.35	2.056	2.061	-0.26	PASS



<b>Relay Test Results for:</b>	59P1P OV PICKUP	(59P1)				
	PICKUP VOLTS	IDEAL	%ERROR	OK?		
	135.000	135.000	-0.00	PASS		
<b>Relay Test Results for:</b>	59P2P OV PICKUP	(59P2)			OK?	
					RAN	
<b>Relay Test Results for:</b>	59G1P OV PICKUP	(59G1)			OK?	
	PICKUP VOLTS	IDEAL	%ERROR	OK?		
	135.000	135.000	-0.00	PASS		
<b>Relay Test Results for:</b>	59G2P OV PICKUP	(59G2)			OK?	
					RAN	
<b>Relay Test Results for:</b>	59Q1P OV PICKUP	(59Q)			OK?	
					RAN	
<b>Relay Test Results for:</b>	59V1P OV PICKUP	(59V1)			OK?	
					RAN	
<b>Relay Test Results for:</b>	59PP1 OV PICKUP	(59PP1)			OK?	
					RAN	
<b>Relay Test Results for:</b>	59PP2 OV PICKUP	(59PP2)			OK?	
					RAN	
<b>Relay Test Results for:</b>	27B81P FREQ INHIBIT	(27B81)			OK?	
	PICKUP VOLTS	IDEAL	%ERROR	OK?		
	20.000	20.000	0.00	PASS		
<b>Relay Test Results for:</b>	81D1P FREQ PICKUP	(81D1)			OK?	
	PICKUP HZ	IDEAL	RANGE	OK?		
	59.090	59.100	59.050 TO 59.150	PASS		
<b>Relay Test Results for:</b>	81D1D FREQ DELAY	(81D1T)			OK?	
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
	58.900	4.72	0.080	0.000 TO 0.093	PASS	
<b>Relay Test Results for:</b>	81D2P FREQ PICKUP	(81D2)			OK?	
					RAN	
<b>Relay Test Results for:</b>	81D2D FREQ DELAY	(81D2T)			OK?	
					RAN	
<b>Relay Test Results for:</b>	81D3P FREQ PICKUP	(81D3)			OK?	
					RAN	
<b>Relay Test Results for:</b>	81D3D FREQ DELAY	(81D3T)			OK?	
					RAN	
<b>Relay Test Results for:</b>	81D4P FREQ PICKUP	(81D4)			OK?	
					RAN	
<b>Relay Test Results for:</b>	81D4D FREQ DELAY	(81D4T)			OK?	
					RAN	



<b>Relay Test Results for:</b> 81D5P FREQ PICKUP (81D5)		OK? RAN				
<b>Relay Test Results for:</b> 81D5D FREQ DELAY (81D5T)		OK? RAN				
<b>Relay Test Results for:</b> 81D6P FREQ PICKUP (81D6)		OK? RAN				
<b>Relay Test Results for:</b> 81D6D FREQ DELAY (81D6T)		OK? RAN				
<b>Relay Test Results for:</b> OOS SINGLE BLINDER TEST						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	27.706	2.010	7.958	8.000	-0.52	PASS
300.00	27.706	2.000	7.998	8.000	-0.02	PASS
330.00	27.706	2.308	6.929	6.928	0.02	PASS
360.00	27.706	2.666	5.999	6.000	-0.01	PASS
30.00	27.706	2.320	6.895	6.928	-0.48	PASS
60.00	27.706	2.000	7.998	8.000	-0.02	PASS
240.00	27.706	2.000	7.998	8.000	-0.02	PASS
210.00	27.706	2.320	6.895	6.928	-0.48	PASS
180.00	27.706	2.666	5.999	6.000	-0.01	PASS
150.00	27.706	2.308	6.929	6.928	0.02	PASS
120.00	27.706	2.000	7.998	8.000	-0.02	PASS
<b>Relay Test Results for:</b> OOS TWO BLINDER INNER TEST		OK? RAN				
<b>Relay Test Results for:</b> OOS TWO BLINDER OUTER TEST		OK? RAN				
<b>Relay Test Results for:</b> OOS TIMING (OOST)		OK? RAN				
<b>Relay Test Results for:</b> 50N1P NEUT PICKUP (50N1)		OK? RAN				

<b>Relay Test Results for:</b> 50N1D NEUT DELAY (50N1T)							OK? RAN
<b>Relay Test Results for:</b> 50N2P NEUT PICKUP (50N2)							OK? RAN
<b>Relay Test Results for:</b> 50N2D NEUT DELAY (50N2T)							OK? RAN
<b>Relay Test Results for:</b> 51NP NEUT PICKUP (51N)							
	PICKUP	CURRENT	IDEAL	%ERROR		OK?	
		1.000	1.000	0.00		PASS	
<b>Relay Test Results for:</b> 51N NEUT TIMING (51NT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	2.000	648.22	10.804	10.817	-0.12	PASS	
3.00	3.000	276.56	4.609	4.619	-0.20	PASS	
4.00	4.000	172.34	2.872	2.883	-0.38	PASS	
							
<b>Relay Test Results for:</b> 50H1P OC PICKUP (50H1)							OK? RAN
<b>Relay Test Results for:</b> 50H1D OC DELAY (50H1T)							OK? RAN
<b>Relay Test Results for:</b> 50H2PA OC PICKUP (50H2A)							OK? RAN
<b>Relay Test Results for:</b> 50H2PB OC PICKUP (50H2B)							OK? RAN
<b>Relay Test Results for:</b> 50H2PC OC PICKUP (50H2C)							OK? RAN
<b>Relay Test Results for:</b> 50H2D OC DELAY (50H2T)							OK? RAN
<b>Relay Test Results for:</b> 50Q1P OC PICKUP (50Q1)							OK? RAN

<b>Relay Test Results for:</b>	50Q1D	OC DELAY	(50Q1T)	OK? RAN
<b>Relay Test Results for:</b>	50Q2P	OC PICKUP	(50Q2)	OK? RAN
<b>Relay Test Results for:</b>	50Q2D	OC DELAY	(50Q2T)	OK? RAN
<b>Relay Test Results for:</b>	50R1P	OC PICKUP	(50R1)	OK? RAN
<b>Relay Test Results for:</b>	50R1D	OC DELAY	(50R1T)	OK? RAN
<b>Relay Test Results for:</b>	50R2P	OC PICKUP	(50R2)	OK? RAN
<b>Relay Test Results for:</b>	50R2D	OC DELAY	(50R2T)	OK? RAN
<b>Relay Test Results for:</b>	U87P	APH PICKUP	(87U1)	OK? RAN
<b>Relay Test Results for:</b>	U87P	87A PICKUP	(87U1)	OK? RAN
<b>Relay Test Results for:</b>	O87P	APH PICKUP	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	O87P	87A PICKUP	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	SLP1	APH DIFF TEST	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	SLP2	APH DIFF TEST	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	RESTORE LOGIC SETTINGS			OK? RAN
<b>Relay Test Results for:</b>	RESTORE PORT SETTINGS			OK? RAN
<b>Relay Test Results for:</b>	COMPARE AF TO AL SETTINGS			OK? RAN
<b>Relay Test Results for:</b>	LOG OUT OF RELAY			OK? RAN

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/12/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 1 Group 2	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325069			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: Gen 1 Group 2	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36 MONTHS		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="2"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$= "GENERATOR"	TID\$= "TERMINAL"	CTR= 100	
CTRD= 100	CTRN= 100	PTR= 100.00	
PTRN= 100.00	VNOM= 115.0	INOM= 5.0	
EBUP\$= "D"	ELE\$= "N"	E24\$= "Y"	
E27\$= "Y"	E32\$= "Y"	E40\$= "Y"	
E46\$= "Y"	E50\$= "Y"	E50_87\$= "N"	
E51\$= "Y"	E59\$= "N"	E64\$= "Y"	
E78\$= "1B"	E81= 1	E81AC= 6	
E87\$= "G"	ESV= 6	ESL= 5	
EDEM\$= "ROL"	Z1R= 8.0	Z1O= 0.0	
MTA1= 88	Z1CMP= 0	Z1D= 0.00	
Z2R= 16.0	Z2O= 0.0	MTA2= 85	
Z2CMP= 0	Z2D= 0.00	s21PTC\$= "!3PO"	
s24D1P= 105	s24D1D= 1.00	s24CCS\$= "ID"	
s24IP= 105	s24IC= 2.0	s24ITD= 0.1	
s24D2P2= 176	s24D2D2= 3.00	s24CR= 240.00	
s24TC\$= "!60LOP"	s27P1P= 54.0	s27P2P\$= "OFF"	
s27V1P\$= "OFF"	s27PP1= 93.5	s27PP2= 93.5	
s32P1P= -0.0500	s32P1D= 20.00	s32P2P= -0.1000	
s32P2D= 5.00	s32PTC\$= "!60LOP"	s40Z1P= 13.4	
s40XD1= -2.5	s40Z1D= 0.00	s40Z2P= 25.0	

Relay Results (continued) for: SEL-300G.FST0361112122013AL

s40XD2=	-2.5	s40Z2D=	0.50	s40ZTC\$=	"!60LOP"
s46Q1P=	8	s46Q1D=	30.00	s46Q2P=	8
s46Q2K=	10	s46QTC=	1	s50P1P\$=	"OFF"
s50P2P\$=	"OFF"	s50N1P=	2.50	s50N1D=	0.10
s50N2P\$=	"OFF"	s50G1P\$=	"OFF"	s50G2P\$=	"OFF"
s51NP=	0.50	s51NC\$=	"U2"	s51NTD=	3.00
s51NRS\$=	"Y"	s51NTC=	1	s51GP\$=	"OFF"
s3POD=	0.00	s50LP=	0.25	s52A\$=	"IN101"
s64G1P=	5.0	s64G1D=	0.75	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	0.08	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
TAP1=	5.00	TAPD=	5.00	U87P=	10.0
O87P=	0.30	SLP1=	40	s87B=	0
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"51NT + 50N1T + 51CT +
51VT + 64G1T + 64G2T + INADT + LT1* 32P2T"					
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
+ /64G2+ /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND+ /BNDT + /INAD"				OUT101\$=	"TRIP1"
OUT102\$=	"TRIP2"	OUT103\$=	"51NT"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)SCEUSE"					
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50

IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"
SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSTCT\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSTCT\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	0	PF_AUTO\$=	"N"	PF_RTSTCT\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

**Relay Test Results for:** RELAY STATUS CHECK

GENERATOR DATE: 12/12/13 TIME: 13:51:48.673  
 TERMINAL  
 FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607 CID=E6A7

IA	IB	IC	IN	VA	VB	VC	VN	MOF
OS 1	-0	-0	-1	1	2	3	1	0
IA87	IB87	IC87						
OS 1	-1	-1						
+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS 5.02	5.03	-5.02	11.99	-11.97	14.93	-15.18		
TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
40.9	OK	OK	OK	OK	OK	OK		
40.9	OK	OK	OK	OK	OK	OK		

**Relay Test Results for:** METER TEST

APPLIED	APPLIED	CURRENT
SEC VOLT	SEC AMP	PH LAG
66.40	2.00	30.00

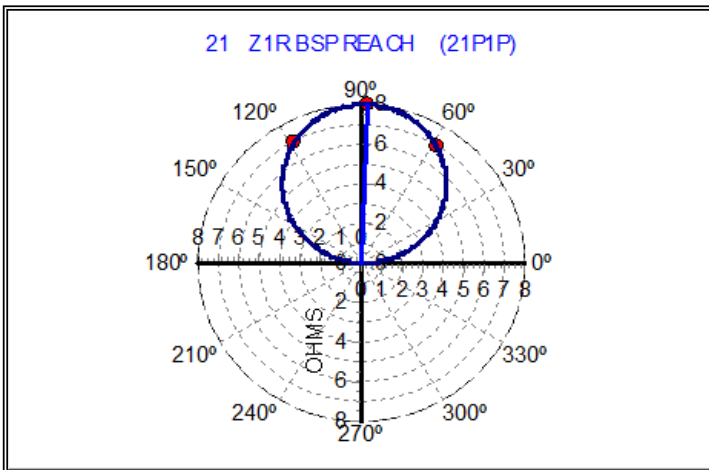
PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	PRI KV	PRI KV		PRI CUR	PRI CUR		
A-N	6.4	6.4	0.0	180.0	180.3	0.1	PASS
B-N	6.6	6.6	0.0	200.0	200.3	0.2	PASS
C-N	6.8	6.8	0.0	220.0	220.3	0.2	PASS

CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR		
3.5	3.5	0.2	2.0	2.0	0.3	PASS

**Relay Test Results for:** 21 Z1R BSP REACH (21P1P)

Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
88.00	89.634	6.469	8.000	8.000	-0.00	PASS
118.00	89.634	7.470	6.928	6.928	-0.01	PASS
58.00	89.634	7.470	6.928	6.928	-0.01	PASS



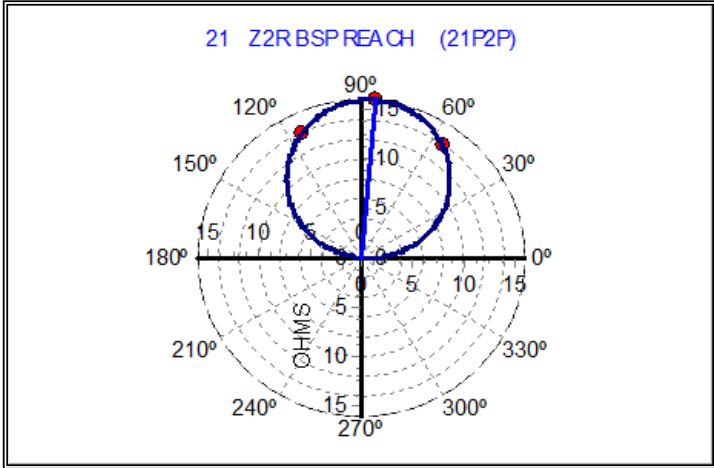
**Relay Test Results for:** 21 Z1O BSP REACH (21P1P)

OK?  
RAN

**Relay Test Results for:** 21 Z1D BSP DELAY (21P1T)

OK?  
RAN

<b>Relay Test Results for:</b>						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
85.00	89.634	3.234	16.000	16.000	-0.00	PASS
115.00	89.634	3.747	13.812	13.856	-0.32	PASS
55.00	89.634	3.722	13.904	13.856	0.34	PASS



<b>Relay Test Results for:</b>						
21 Z2O BSP REACH (21P2P)						OK?
						RAN

<b>Relay Test Results for:</b>						
21 Z2D BSP DELAY (21P2T)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z1C BSP REACH (21C1P)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z1CO BSP REACH (21C1P)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C 50PP1 PICKUP (50PP1)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z1CD BSP DELAY (21C1T)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z2C BSP REACH (21C2P)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z2CO BSP REACH (21C2P)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C 50PP2 PICKUP (50PP2)						OK?
						RAN

<b>Relay Test Results for:</b>						
21C Z2CD BSP DELAY (21C2T)						OK?
						RAN

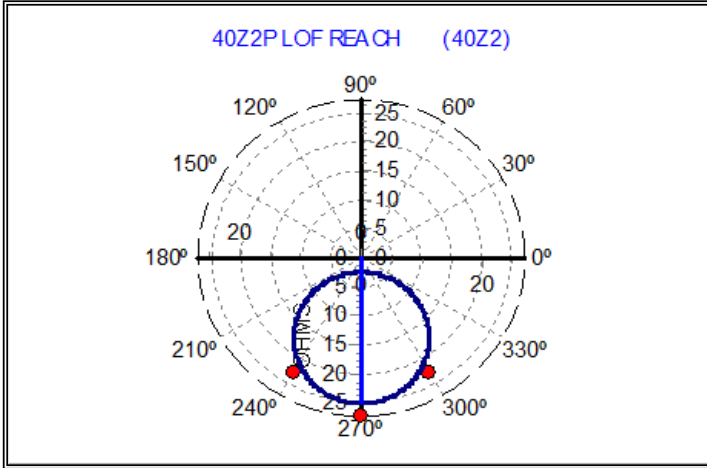
<b>Relay Test Results for:</b>						
24D1P V/HZ PICKUP (24D1)		PICKUP VOLTS	IDEAL	%ERROR	OK?	
		121.957	120.750	1.00	PASS	



<b>Relay Test Results for:</b> 24D1D V/HZ DELAY (24D1T)																
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?										
1.20	144.900	62.77	1.046	0.925 TO 1.075		PASS										
<b>Relay Test Results for:</b> 24D2P1 V/HZ PICKUP (24C2)																
						OK? RAN										
<b>Relay Test Results for:</b> 24D2D1 V/HZ DELAY (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24D2D2 V/HZ DELAY (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ PICKUP (24C2)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ CURVE (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (ID) V/HZ PICKUP (24C2)																
	PICKUP VOLTS	IDEAL	%ERROR			OK?										
	121.957	120.750	1.00			PASS										
<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)																
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?										
1.10	132.825	620.97	10.350	9.475 TO 10.525		PASS										
1.20	144.900	155.24	2.587	2.350 TO 2.650		PASS										
1.30	156.975	70.09	1.168	1.031 TO 1.192		PASS										
1.50	181.125	26.76	0.444	0.355 TO 0.445		PASS										
<p>24IP (ID) V/HZ CURVE (24C2T)</p> <table border="1"> <caption>Data points for 24IP (ID) V/HZ CURVE (24C2T)</caption> <thead> <tr> <th>MULTIPLE OF TAP</th> <th>TIME IN SECONDS</th> </tr> </thead> <tbody> <tr> <td>1.10</td> <td>132.825</td> </tr> <tr> <td>1.20</td> <td>144.900</td> </tr> <tr> <td>1.30</td> <td>156.975</td> </tr> <tr> <td>1.50</td> <td>181.125</td> </tr> </tbody> </table>							MULTIPLE OF TAP	TIME IN SECONDS	1.10	132.825	1.20	144.900	1.30	156.975	1.50	181.125
MULTIPLE OF TAP	TIME IN SECONDS															
1.10	132.825															
1.20	144.900															
1.30	156.975															
1.50	181.125															
<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)																
	PICKUP VOLTS	IDEAL	%ERROR			OK?										
	54.000	54.000	0.00			PASS										
<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)																
						OK? RAN										
<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)																
						OK? RAN										

<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
	53.982	53.982		-0.00	PASS		
<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
	53.982	53.982		-0.00	PASS		
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH		0.250	0.250	0.00	PASS		
<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.300	1202.03	20.034	18.975 TO 21.025	PASS		
<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH		0.505	0.500	1.00	PASS		
<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.600	301.97	5.033	4.725 TO 5.275	PASS		
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	2.109	15.741	15.900	-1.00	PASS	
300.00	33.198	2.612	12.710	12.839	-1.00	PASS	
240.00	33.198	2.612	12.710	12.839	-1.00	PASS	
<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	13.280	2.500	2.500	-0.00	PASS	
<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 40Z2P LOF REACH (40Z2)						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	33.198	1.220	27.221	27.500	-1.02	PASS
300.00	33.198	1.458	22.761	22.990	-1.00	PASS
240.00	33.198	1.458	22.761	22.990	-1.00	PASS



<b>Relay Test Results for:</b> 40XD2 LOF REACH (40Z2)						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	33.198	13.280	2.500	2.500	-0.00	PASS

<b>Relay Test Results for:</b> 40Z2D LOF DELAY (40Z2T)						
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?	
27.50	22.92	33.26	0.554	0.425 TO 0.575	PASS	

<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
1.212	1.200	1.00	PASS			

<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	1.440	1803.02	30.050	28.450 TO 31.550	PASS	

<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
1.212	1.200	1.00	PASS			

<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
15.000	603.17	10.053	9.450 TO 10.550	PASS		

<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
7.500	2406.58	40.110	37.950 TO 42.050	PASS		

<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						
OK?						
RAN						

<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
OK?						
RAN						

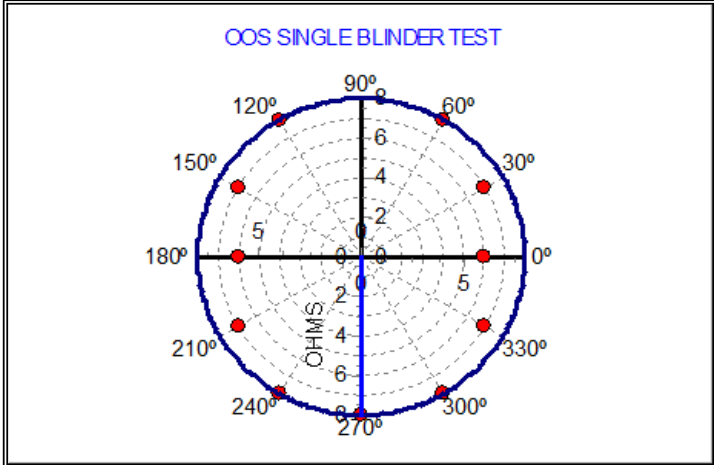
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
OK?						
RAN						

<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
OK?						
RAN						

<b>Relay Test Results for:</b>	50G1P OC PICKUP	(50G1)	OK? RAN
<b>Relay Test Results for:</b>	50G1D OC DELAY	(50G1T)	OK? RAN
<b>Relay Test Results for:</b>	50G2P OC PICKUP	(50G2)	OK? RAN
<b>Relay Test Results for:</b>	50G2D OC DELAY	(50G2T)	OK? RAN
<b>Relay Test Results for:</b>	51GP OC PICKUP	(51G)	OK? RAN
<b>Relay Test Results for:</b>	51G OC TIMING	(51GT)	OK? RAN
<b>Relay Test Results for:</b>	51CP OC PICKUP	(51C)	OK? RAN
<b>Relay Test Results for:</b>	51C OC TIMING	(51CT)	OK? RAN
<b>Relay Test Results for:</b>	51VP (100%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51VP (75%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51V (100%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	51V (75%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	59P1P OV PICKUP	(59P1)	OK? RAN
<b>Relay Test Results for:</b>	59P2P OV PICKUP	(59P2)	OK? RAN
<b>Relay Test Results for:</b>	59G1P OV PICKUP	(59G1)	OK? RAN
<b>Relay Test Results for:</b>	59G2P OV PICKUP	(59G2)	OK? RAN
<b>Relay Test Results for:</b>	59Q1P OV PICKUP	(59Q)	OK? RAN

<b>Relay Test Results for:</b>	59V1P OV PICKUP	(59V1)							OK? RAN
<b>Relay Test Results for:</b>	59PP1 OV PICKUP	(59PP1)							OK? RAN
<b>Relay Test Results for:</b>	59PP2 OV PICKUP	(59PP2)							OK? RAN
<b>Relay Test Results for:</b>	27B81P	FREQ INHIBIT	(27B81)						
	PICKUP	VOLTS	IDEAL	%ERROR					OK? PASS
		20.000	20.000	0.00					
<b>Relay Test Results for:</b>	81D1P	FREQ PICKUP	(81D1)						
	PICKUP	HZ	IDEAL	RANGE					OK? PASS
		59.090	59.100	59.050 TO 59.150					
<b>Relay Test Results for:</b>	81D1D	FREQ DELAY	(81D1T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE					OK? PASS
	58.900	4.62	0.078	0.000 TO 0.093					
<b>Relay Test Results for:</b>	81D2P	FREQ PICKUP	(81D2)						OK? RAN
<b>Relay Test Results for:</b>	81D2D	FREQ DELAY	(81D2T)						OK? RAN
<b>Relay Test Results for:</b>	81D3P	FREQ PICKUP	(81D3)						OK? RAN
<b>Relay Test Results for:</b>	81D3D	FREQ DELAY	(81D3T)						OK? RAN
<b>Relay Test Results for:</b>	81D4P	FREQ PICKUP	(81D4)						OK? RAN
<b>Relay Test Results for:</b>	81D4D	FREQ DELAY	(81D4T)						OK? RAN
<b>Relay Test Results for:</b>	81D5P	FREQ PICKUP	(81D5)						OK? RAN
<b>Relay Test Results for:</b>	81D5D	FREQ DELAY	(81D5T)						OK? RAN
<b>Relay Test Results for:</b>	81D6P	FREQ PICKUP	(81D6)						OK? RAN
<b>Relay Test Results for:</b>	81D6D	FREQ DELAY	(81D6T)						OK? RAN

<b>Relay Test Results for:</b> OOS SINGLE BLINDER TEST							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
60.00	26.552	1.925	7.962	8.000	-0.48	PASS	
240.00	26.552	1.925	7.962	8.000	-0.48	PASS	
210.00	26.552	2.213	6.928	6.928	-0.00	PASS	
180.00	26.552	2.567	5.971	6.000	-0.49	PASS	
150.00	26.552	2.213	6.928	6.928	-0.00	PASS	
120.00	26.552	1.916	8.002	8.000	0.02	PASS	
270.00	26.552	1.925	7.962	8.000	-0.48	PASS	
300.00	26.552	1.916	8.002	8.000	0.02	PASS	
330.00	26.552	2.213	6.928	6.928	-0.00	PASS	
360.00	26.552	2.567	5.971	6.000	-0.49	PASS	
30.00	26.552	2.213	6.928	6.928	-0.00	PASS	



<b>Relay Test Results for:</b> OOS TWO BLINDER INNER TEST							
						OK?	
						RAN	

<b>Relay Test Results for:</b> OOS TWO BLINDER OUTER TEST							
						OK?	
						RAN	

<b>Relay Test Results for:</b> OOS TIMING (OOST)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 50N1P NEUT PICKUP (50N1)							
PICKUP	CURRENT	IDEAL	%ERROR		OK?		
	2.500	2.500	-0.00		PASS		

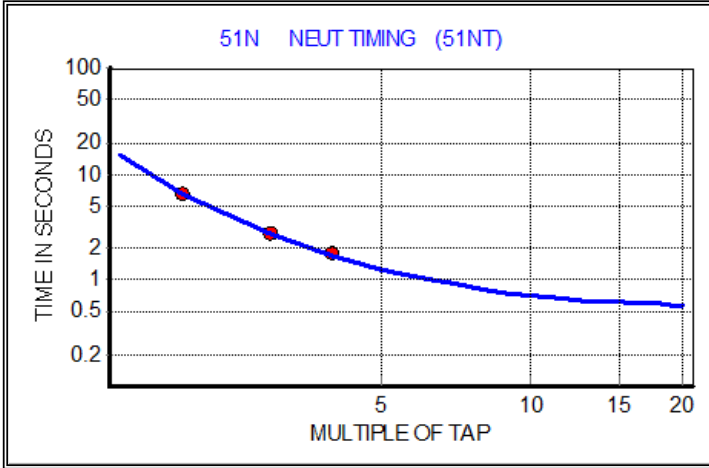
<b>Relay Test Results for:</b> 50N1D NEUT DELAY (50N1T)							
MULTIPLE	VALUE	TIME (CY)	TIME (SEC)	RANGE		OK?	
1.20	3.000	7.55	0.126	0.070	TO 0.130	PASS	

<b>Relay Test Results for:</b> 50N2P NEUT PICKUP (50N2)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 50N2D NEUT DELAY (50N2T)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 51NP NEUT PICKUP (51N)							
PICKUP	CURRENT	IDEAL	%ERROR		OK?		
	0.505	0.500	1.00		PASS		

<b>Relay Test Results for:</b> 51N NEUT TIMING (51NT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	1.000	391.19	6.520	6.490	0.46	PASS	
3.00	1.500	166.82	2.780	2.771	0.33	PASS	
4.00	2.000	104.06	1.734	1.730	0.25	PASS	



<b>Relay Test Results for:</b> 50H1P OC PICKUP (50H1)	OK? RAN
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<b>Relay Test Results for:</b> 50H1D OC DELAY (50H1T)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PA OC PICKUP (50H2A)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PB OC PICKUP (50H2B)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PC OC PICKUP (50H2C)	OK? RAN
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<b>Relay Test Results for:</b> 50H2D OC DELAY (50H2T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1P OC PICKUP (50Q1)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1D OC DELAY (50Q1T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2P OC PICKUP (50Q2)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2D OC DELAY (50Q2T)	OK? RAN
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<b>Relay Test Results for:</b> 50R1P OC PICKUP (50R1)	OK? RAN
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<b>Relay Test Results for:</b>	50R1D	OC DELAY	(50R1T)						OK? RAN
<b>Relay Test Results for:</b>	50R2P	OC PICKUP	(50R2)						OK? RAN
<b>Relay Test Results for:</b>	50R2D	OC DELAY	(50R2T)						OK? RAN
<b>Relay Test Results for:</b>	U87P APH PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87A PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P APH PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	O87P 87A PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	SLP1 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	14.400	9.60	9.60	9.12 TO 10.08					PASS
<b>Relay Test Results for:</b>	SLP2 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	22.500	13.50	13.50	12.82 TO 14.18					PASS
<b>Relay Test Results for:</b>	U87P BPH PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87B PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P BPH PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.515	1.500	1.00					
<b>Relay Test Results for:</b>	O87P 87B PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	SLP1 BPH DIFF TEST		(87R2)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	14.400	9.60	9.60	9.12 TO 10.08					PASS
<b>Relay Test Results for:</b>	SLP2 BPH DIFF TEST		(87R2)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	22.500	13.50	13.50	12.82 TO 14.18					PASS
<b>Relay Test Results for:</b>	U87P CPH PICKUP		(87U3)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					



<b>Relay Test Results for:</b>	U87P 87C PICKUP	(87U3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	50.000	50.000	0.00	PASS				
<b>Relay Test Results for:</b>	O87P CPH PICKUP	(87R3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	1.500	1.500	-0.00	PASS				
<b>Relay Test Results for:</b>	O87P 87C PICKUP	(87R3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	1.500	1.500	-0.00	PASS				
<b>Relay Test Results for:</b>	SLP1 CPH DIFF TEST	(87R3)						
	RESTRAINT OPERATE	IDEAL	RANGE	OK?				
	CURRENT	CURRENT						
	22.500	13.50	13.50	12.82 TO 14.18	PASS			
<b>Relay Test Results for:</b>	SLP2 CPH DIFF TEST	(87R3)						
	RESTRAINT OPERATE	IDEAL	RANGE	OK?				
	CURRENT	CURRENT						
	22.500	13.50	13.50	12.82 TO 14.18	PASS			
<b>Relay Test Results for:</b>	RESTORE LOGIC SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	RESTORE PORT SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	COMPARE AF TO AL SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	LOG OUT OF RELAY						OK?	
							RAN	

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/12/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 2 Group 1	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325070			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: Gen 2 300G TOC	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36 MONTHS		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="1"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$="GENERATOR"	TID\$="TERMINAL"	CTR=40	
CTRD=40	CTRN=40	PTR=103.90	
PTRN=103.90	VNOM=120.0	INOM=2.9	
EBUP\$="V"	E24\$="Y"	E27\$="Y"	
E32\$="Y"	E40\$="Y"	E46\$="Y"	
E50\$="Y"	E50_87\$="N"	E51\$="Y"	
E59\$="Y"	E64\$="Y"	E78\$="1B"	
E81=1	E81AC=6	E87\$="N"	
ESV=6	ESL=5	EDEM\$="ROL"	
s24D1P=105	s24D1D=1.00	s24CCS\$="ID"	
s24IP=105	s24IC=2.0	s24ITD=0.1	
s24D2P2=176	s24D2D2=3.00	s24CR=240.00	
s24TC\$="!60LOP"	s27P1P=54.0	s27P2P\$="OFF"	
s27V1P\$="OFF"	s27PP1=93.5	s27PP2=93.5	
s32P1P=-0.0500	s32P1D=20.00	s32P2P=-0.1000	
s32P2D=5.00	s32PTC\$="!60LOP"	s40Z1P=13.4	
s40XD1=-2.5	s40Z1D=0.00	s40Z2P=25.0	
s40XD2=-2.5	s40Z2D=0.50	s40ZTC\$="!60LOP"	
s46Q1P=8	s46Q1D=30.00	s46Q2P=8	
s46Q2K=10	s46QTC=1	s50P1P=37.50	
s50P1D=0.00	s50P2P\$="OFF"	s50N1P\$="OFF"	

Relay Results (continued) for: SEL-300G.FST1534112122013AL

s50N2P\$=	"OFF"	s50G1P=	3.00	s50G1D=	0.00
s50G2P\$=	"OFF"	s51NP=	1.00	s51NC\$=	"U2"
s51NTD=	5.00	s51NRS\$=	"N"	s51NTC=	1
s51GP\$=	"OFF"	s51VCA=	0	s51VP=	4.35
s51VC\$=	"U1"	s51VTD=	6.70	s51VRS\$=	"N"
s51VTC\$=	"!60LOP"	s3POD=	0.00	s50LP=	0.25
s52A\$=	"IN101"	s59P1P=	135.0	s59P2P\$=	"OFF"
s59G1P=	135.0	s59G2P\$=	"OFF"	s59QP\$=	"OFF"
s59V1P\$=	"OFF"	s59PP1\$=	"OFF"	s59PP2\$=	"OFF"
s64G1P=	5.0	s64G1D=	2.00	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	2.00	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"50P1T + 51VT + 87U +
87R"					
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
			+ /64G2 + /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND + /BNDT + /INAD"	OUT101\$=	"SV3"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)	SCEUSE"				
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50
IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"

SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSTCT\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSTCT\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSTCT\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

**Relay Test Results for:** RELAY STATUS CHECK

GENERATOR DATE: 12/12/13 TIME: 08:17:52.380  
 TERMINAL  
 FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607 CID=E6A7  

IA	IB	IC	IN	VA	VB	VC	VN	MOF
OS 0	-1	1	2	-0	1	-2	0	-0
IA87	IB87	IC87						
OS 0	0	-1						
+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS 5.01	5.03	-4.96	11.99	-12.02	14.97	-15.16		
TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
40.4	OK	OK	OK	OK	OK	OK		
40.4	OK	OK	OK	OK	OK	OK		

**Relay Test Results for:** METER TEST

APPLIED	APPLIED	CURRENT					
SEC VOLT	SEC AMP	PH LAG					
69.28	2.00	30.00					

PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	PRI KV	PRI KV		PRI CUR	PRI CUR		
A-N	7.0	7.0	-0.0	72.0	72.2	0.2	PASS
B-N	7.2	7.2	0.0	80.0	80.2	0.2	PASS
C-N	7.4	7.4	-0.1	88.0	88.3	0.3	PASS

CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR		
1.5	1.5	0.3	0.9	0.9	0.2	PASS

**Relay Test Results for:** 21 Z1R BSP REACH (21P1P)  
 OK?  
 RAN

**Relay Test Results for:** 21 Z1O BSP REACH (21P1P)  
 OK?  
 RAN

**Relay Test Results for:** 21 Z1D BSP DELAY (21P1T)  
 OK?  
 RAN

**Relay Test Results for:** 21 Z2R BSP REACH (21P2P)  
 OK?  
 RAN

**Relay Test Results for:** 21 Z2O BSP REACH (21P2P)  
 OK?  
 RAN

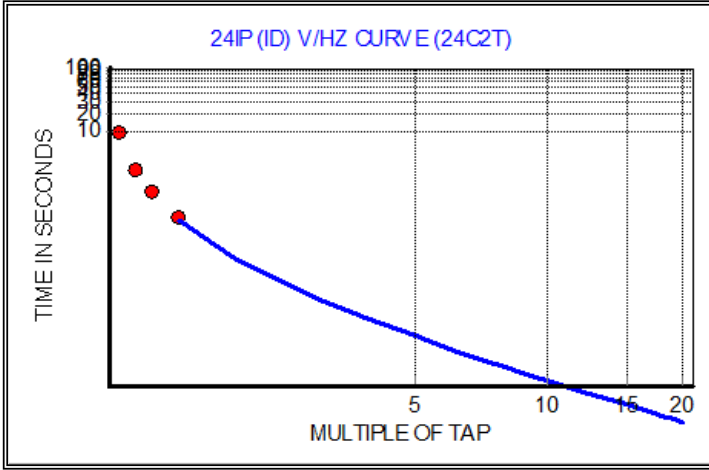
**Relay Test Results for:** 21 Z2D BSP DELAY (21P2T)  
 OK?  
 RAN

**Relay Test Results for:** 21C Z1C BSP REACH (21C1P)  
 OK?  
 RAN

**Relay Test Results for:** 21C Z1CO BSP REACH (21C1P)  
 OK?  
 RAN

<b>Relay Test Results for:</b>	21C 50PP1 PICKUP	(50PP1)							OK? RAN
<b>Relay Test Results for:</b>	21C Z1CD BSP DELAY	(21C1T)							OK? RAN
<b>Relay Test Results for:</b>	21C Z2C BSP REACH	(21C2P)							OK? RAN
<b>Relay Test Results for:</b>	21C Z2CO BSP REACH	(21C2P)							OK? RAN
<b>Relay Test Results for:</b>	21C 50PP2 PICKUP	(50PP2)							OK? RAN
<b>Relay Test Results for:</b>	21C Z2CD BSP DELAY	(21C2T)							OK? RAN
<b>Relay Test Results for:</b>	24D1P V/HZ PICKUP	(24D1)							OK? RAN
	PICKUP VOLTS	IDEAL	%ERROR						OK? PASS
	126.000	126.000	0.00						
<b>Relay Test Results for:</b>	24D1D V/HZ DELAY	(24D1T)							OK? RAN
	MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE				OK?
	1.20	151.200	62.65	1.044	0.925 TO 1.075				PASS
<b>Relay Test Results for:</b>	24D2P1 V/HZ PICKUP	(24C2)							OK? RAN
<b>Relay Test Results for:</b>	24D2D1 V/HZ DELAY	(24C2T)							OK? RAN
<b>Relay Test Results for:</b>	24D2D2 V/HZ DELAY	(24C2T)							OK? RAN
<b>Relay Test Results for:</b>	24IP (I) V/HZ PICKUP	(24C2)							OK? RAN
<b>Relay Test Results for:</b>	24IP (I) V/HZ CURVE	(24C2T)							OK? RAN
<b>Relay Test Results for:</b>	24IP (ID) V/HZ PICKUP	(24C2)							OK? RAN
	PICKUP VOLTS	IDEAL	%ERROR						OK? PASS
	126.000	126.000	0.00						

<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.10	138.600	576.25	9.604	9.475	TO 10.525	PASS
1.20	151.200	149.62	2.494	2.350	TO 2.650	PASS
1.30	163.800	68.32	1.139	1.031	TO 1.192	PASS
1.50	189.000	26.69	0.445	0.355	TO 0.445	PASS



<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)					
PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	53.460	54.000	-1.00	PASS	

<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)					
					OK?
					RAN

<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)					
					OK?
					RAN

<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)					
PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	53.442	53.982	-1.00	PASS	

<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)					
PICKUP	VOLTS	IDEAL	%ERROR	OK?	
	53.982	53.982	-0.00	PASS	

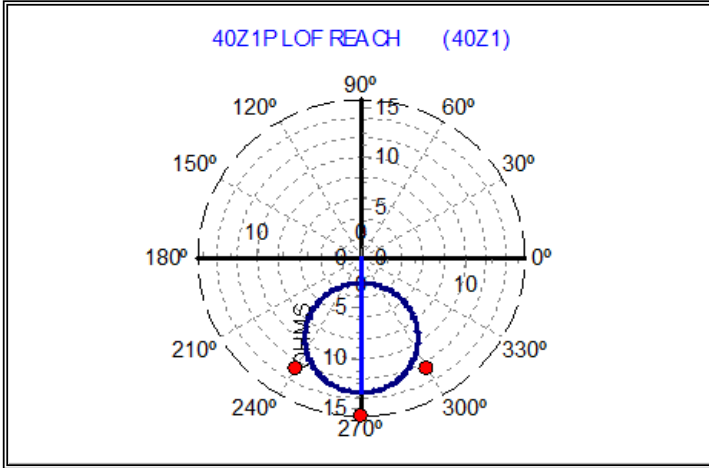
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)					
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?
3PH		0.145	0.145	0.34	PASS

<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	0.174	1202.00	20.033	18.975	TO 21.025	PASS

<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)					
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?
3PH		0.290	0.290	0.00	PASS

<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	0.348	302.02	5.034	4.725	TO 5.275	PASS

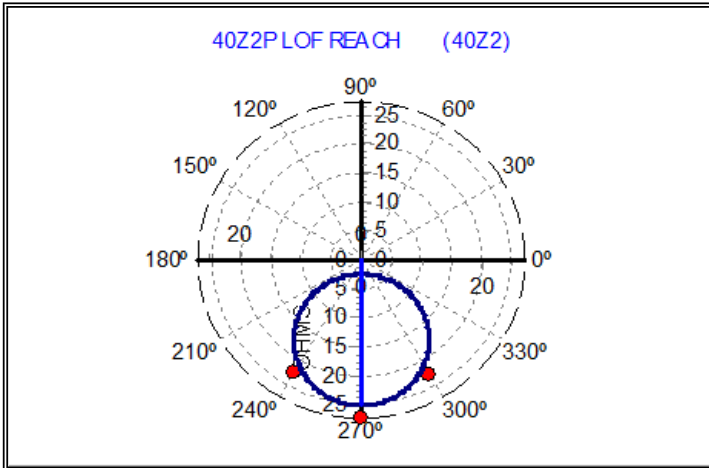
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	2.200	15.744	15.900	-0.98	PASS	
300.00	34.641	2.725	12.713	12.839	-0.98	PASS	
240.00	34.641	2.725	12.713	12.839	-0.98	PASS	



<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	13.856	2.500	2.500	0.00	PASS	

<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)						
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?	
27.50	22.92	33.27	0.554	0.425 TO 0.575	PASS	

<b>Relay Test Results for:</b> 40Z2P LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	1.272	27.238	27.500	-0.95	PASS	
300.00	34.641	1.522	22.767	22.990	-0.97	PASS	
240.00	34.641	1.537	22.544	22.990	-1.94	PASS	



<b>Relay Test Results for:</b> 40XD2 LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	13.856	2.500	2.500	0.00	PASS	

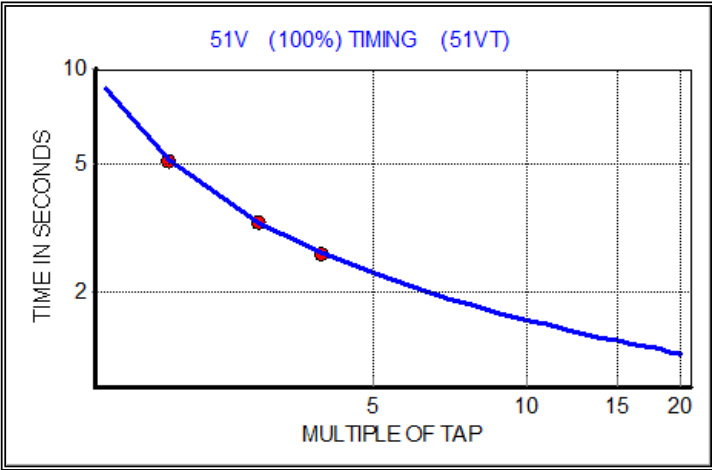
<b>Relay Test Results for:</b> 40Z2D LOF DELAY (40Z2T)						
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?	
27.50	22.92	33.27	0.554	0.425 TO 0.575	PASS	



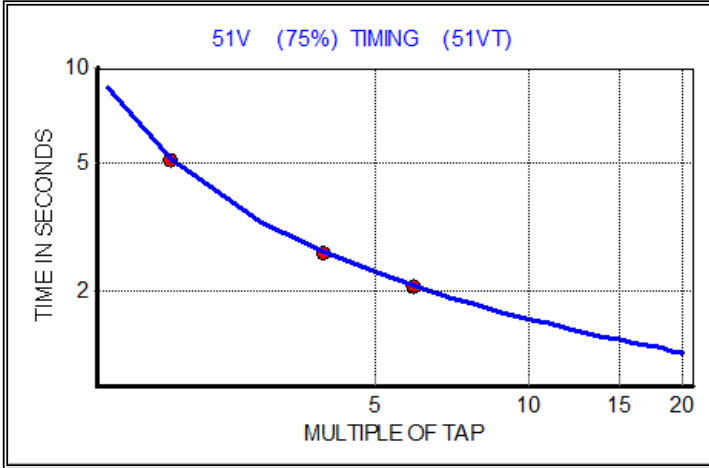
<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		0.703	0.696	0.96	PASS	
<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	0.835	1802.83	30.047	28.450 TO 31.550	PASS	
<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		0.696	0.696	-0.04	PASS	
<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
	8.700	602.67	10.044	9.450 TO 10.550	PASS	
<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
	4.350	2409.35	40.156	37.950 TO 42.050	PASS	
<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
C-N		37.501	37.500	0.00	PASS	
A-N		37.501	37.500	0.00	PASS	
B-N		37.876	37.500	1.00	PASS	
<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
50P1D OC DELAY (50P1T) (PHASE C-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.54	0.024	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE A-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.54	0.024	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE B-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.54	0.024	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50G1P OC PICKUP (50G1)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		3.000	3.000	-0.00	PASS	
<b>Relay Test Results for:</b> 50G1D OC DELAY (50G1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	3.600	1.39	0.023	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50G2P OC PICKUP (50G2)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50G2D OC DELAY (50G2T)						
					OK?	
					RAN	

<b>Relay Test Results for:</b> 51GP OC PICKUP (51G)				OK?
				RAN
<b>Relay Test Results for:</b> 51G OC TIMING (51GT)				OK?
				RAN
<b>Relay Test Results for:</b> 51CP OC PICKUP (51C)				OK?
				RAN
<b>Relay Test Results for:</b> 51C OC TIMING (51CT)				OK?
				RAN
<b>Relay Test Results for:</b> 51VP (100%) PICKUP (51V)				
PICKUP	CURRENT	IDEAL	%ERROR	OK?
	4.349	4.350	-0.01	PASS
<b>Relay Test Results for:</b> 51VP (75%) PICKUP (51V)				
PICKUP	CURRENT	IDEAL	%ERROR	OK?
	3.262	3.263	-0.00	PASS

<b>Relay Test Results for:</b> 51V (100%) TIMING (51VT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	8.700	307.87	5.131	5.143	-0.23	PASS
3.00	13.050	196.97	3.283	3.288	-0.15	PASS
4.00	17.400	157.41	2.623	2.630	-0.24	PASS



<b>Relay Test Results for:</b> 51V (75%) TIMING (51VT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	6.525	308.35	5.139	5.143	-0.08	PASS
4.00	13.050	157.49	2.625	2.630	-0.19	PASS
6.00	19.575	123.40	2.057	2.061	-0.23	PASS



<b>Relay Test Results for:</b> 59P1P OV PICKUP (59P1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59P2P OV PICKUP (59P2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

<b>Relay Test Results for:</b> 59G1P OV PICKUP (59G1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59G2P OV PICKUP (59G2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

<b>Relay Test Results for:</b> 59Q1P OV PICKUP (59Q)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

<b>Relay Test Results for:</b> 59V1P OV PICKUP (59V1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

<b>Relay Test Results for:</b> 59PP1 OV PICKUP (59PP1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

<b>Relay Test Results for:</b> 59PP2 OV PICKUP (59PP2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

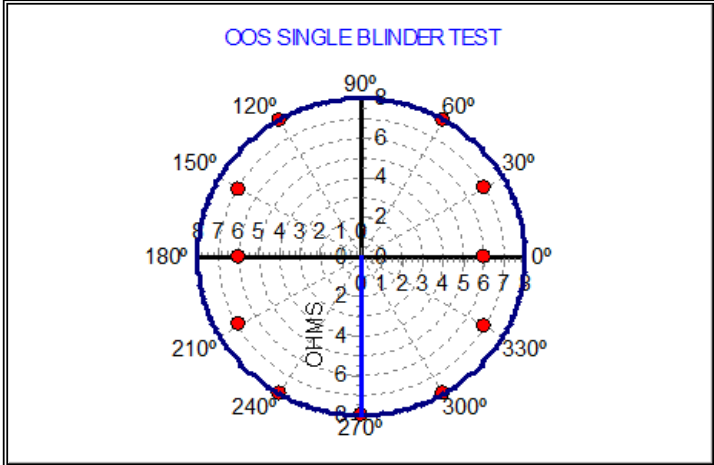
<b>Relay Test Results for:</b> 27B81P FREQ INHIBIT (27B81)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
20.000	20.000	0.00	PASS			

<b>Relay Test Results for:</b> 81D1P FREQ PICKUP (81D1)						
PICKUP	HZ	IDEAL	RANGE	OK?		
59.090	59.100	59.050 TO 59.150	PASS			

<b>Relay Test Results for:</b> 81D1D FREQ DELAY (81D1T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
58.900	4.19	0.071	0.000 TO 0.093	PASS		

<b><u>Relay Test Results for:</u></b> 81D2P	FREQ PICKUP	(81D2)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D2D	FREQ DELAY	(81D2T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D3P	FREQ PICKUP	(81D3)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D3D	FREQ DELAY	(81D3T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D4P	FREQ PICKUP	(81D4)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D4D	FREQ DELAY	(81D4T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D5P	FREQ PICKUP	(81D5)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D5D	FREQ DELAY	(81D5T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D6P	FREQ PICKUP	(81D6)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D6D	FREQ DELAY	(81D6T)	OK? RAN

<b>Relay Test Results for:</b>		OOS SINGLE BLINDER TEST					
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	27.706	2.010	7.958	8.000	-0.52	PASS	
300.00	27.706	2.000	7.998	8.000	-0.02	PASS	
330.00	27.706	2.308	6.929	6.928	0.02	PASS	
360.00	27.706	2.680	5.970	6.000	-0.51	PASS	
30.00	27.706	2.308	6.929	6.928	0.02	PASS	
60.00	27.706	2.000	7.998	8.000	-0.02	PASS	
240.00	27.706	2.000	7.998	8.000	-0.02	PASS	
210.00	27.706	2.320	6.895	6.928	-0.48	PASS	
180.00	27.706	2.666	5.999	6.000	-0.01	PASS	
150.00	27.706	2.320	6.895	6.928	-0.48	PASS	
120.00	27.706	2.000	7.998	8.000	-0.02	PASS	



**Relay Test Results for:** OOS TWO BLINDER INNER TEST  
OK?  
RAN

**Relay Test Results for:** OOS TWO BLINDER OUTER TEST  
OK?  
RAN

**Relay Test Results for:** OOS TIMING (OOST)  
OK?  
RAN

**Relay Test Results for:** RESTORE LOGIC SETTINGS  
OK?  
RAN

**Relay Test Results for:** RESTORE PORT SETTINGS  
OK?  
RAN

**Relay Test Results for:** COMPARE AF TO AL SETTINGS  
OK?  
RAN

**Relay Test Results for:** LOG OUT OF RELAY  
OK?  
RAN

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/12/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 2 Group 2	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style:		
IEEE_Device: MF	IL_IB:		
Serial_Number: 2007325070			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: 0	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="2"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$= "GENERATOR"	TID\$= "TERMINAL"	CTR= 100	
CTRD= 100	CTRN= 100	PTR= 100.00	
PTRN= 100.00	VNOM= 115.0	INOM= 5.0	
EBUP\$= "D"	ELE\$= "N"	E24\$= "Y"	
E27\$= "Y"	E32\$= "Y"	E40\$= "Y"	
E46\$= "Y"	E50\$= "Y"	E50_87\$= "N"	
E51\$= "Y"	E59\$= "N"	E64\$= "Y"	
E78\$= "1B"	E81= 1	E81AC= 6	
E87\$= "G"	ESV= 6	ESL= 5	
EDEM\$= "ROL"	Z1R= 8.0	Z1O= 0.0	
MTA1= 88	Z1CMP= 0	Z1D= 0.00	
Z2R= 16.0	Z2O= 0.0	MTA2= 85	
Z2CMP= 0	Z2D= 0.00	s21PTC\$= "!3PO"	
s24D1P= 105	s24D1D= 1.00	s24CCS\$= "ID"	
s24IP= 105	s24IC= 2.0	s24ITD= 0.1	
s24D2P2= 176	s24D2D2= 3.00	s24CR= 240.00	
s24TC\$= "!60LOP"	s27P1P= 54.0	s27P2P\$= "OFF"	
s27V1P\$= "OFF"	s27PP1= 93.5	s27PP2= 93.5	
s32P1P= -0.0500	s32P1D= 20.00	s32P2P= -0.1000	
s32P2D= 5.00	s32PTC\$= "!60LOP"	s40Z1P= 13.4	
s40XD1= -2.5	s40Z1D= 0.00	s40Z2P= 25.0	

Relay Results (continued) for: SEL-300G.FST1430412122013AL

s40XD2=	-2.5	s40Z2D=	0.50	s40ZTC\$=	"!60LOP"
s46Q1P=	8	s46Q1D=	30.00	s46Q2P=	8
s46Q2K=	10	s46QTC=	1	s50P1P\$=	"OFF"
s50P2P\$=	"OFF"	s50N1P=	2.50	s50N1D=	0.10
s50N2P\$=	"OFF"	s50G1P\$=	"OFF"	s50G2P\$=	"OFF"
s51NP=	0.50	s51NC\$=	"U2"	s51NTD=	3.00
s51NRS\$=	"Y"	s51NTC=	1	s51GP\$=	"OFF"
s3POD=	0.00	s50LP=	0.25	s52A\$=	"IN101"
s64G1P=	5.0	s64G1D=	0.75	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	0.08	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
TAP1=	5.00	TAPD=	5.00	U87P=	10.0
O87P=	0.30	SLP1=	40	s87B=	0
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"51NT + 50N1T + 51CT +
51VT + 64G1T + 64G2T + INADT + LT1* 32P2T"					
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
+ /64G2+ /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND+ /BNDT + /INAD"				OUT101\$=	"TRIP1"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)SCEUSE"					
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50

IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"
SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSTCT\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSTCT\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSTCT\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7



**Relay Test Results for:** RELAY STATUS CHECK

GENERATOR DATE: 12/12/13 TIME: 10:22:20.205  
 TERMINAL  
 FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607 CID=E6A7

IA	IB	IC	IN	VA	VB	VC	VN	MOF
OS 0	-1	1	2	-0	1	-2	0	-0
IA87	IB87	IC87						
OS 0	0	-1						
+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS 5.01	5.03	-4.96	11.99	-12.02	14.97	-15.16		
TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
40.6	OK	OK	OK	OK	OK	OK		
40.6	OK	OK	OK	OK	OK	OK		

**Relay Test Results for:** METER TEST

APPLIED	APPLIED	CURRENT
SEC VOLT	SEC AMP	PH LAG
66.40	2.00	30.00

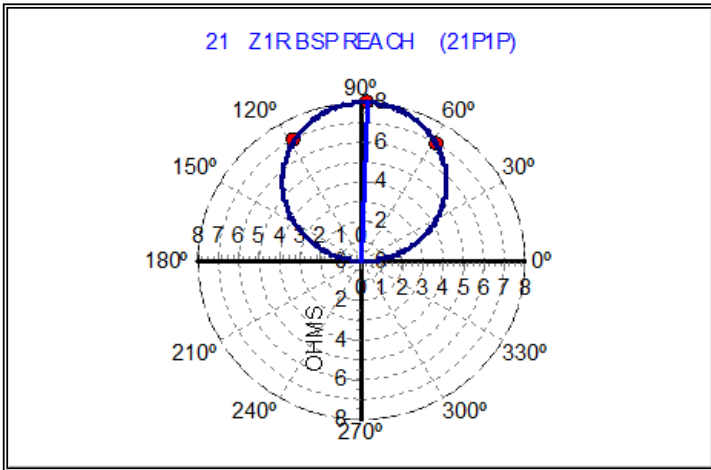
PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	PRI KV	PRI KV		PRI CUR	PRI CUR		
A-N	6.4	6.4	0.0	180.0	180.5	0.3	PASS
B-N	6.6	6.6	0.0	200.0	200.5	0.3	PASS
C-N	6.8	6.8	0.0	220.0	220.7	0.3	PASS

CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR		
3.5	3.5	0.3	2.0	2.0	0.3	PASS

**Relay Test Results for:** 21 Z1R BSP REACH (21P1P)

Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
88.00	89.634	6.469	8.000	8.000	-0.00	PASS
118.00	89.634	7.470	6.928	6.928	-0.01	PASS
58.00	89.634	7.470	6.928	6.928	-0.01	PASS



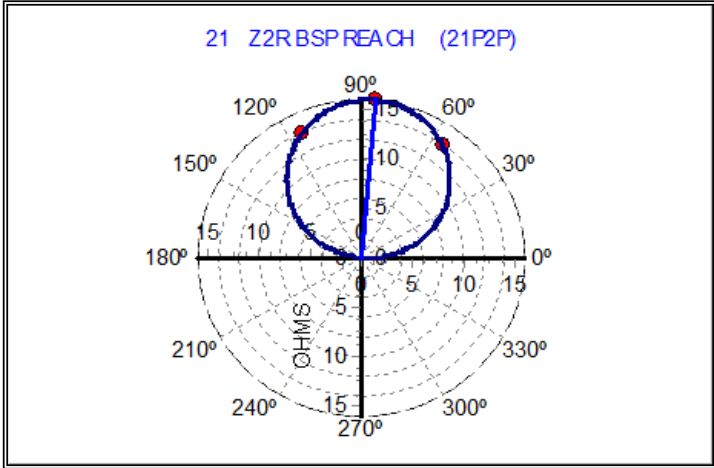
**Relay Test Results for:** 21 Z1O BSP REACH (21P1P)

OK?  
RAN

**Relay Test Results for:** 21 Z1D BSP DELAY (21P1T)

OK?  
RAN

<b>Relay Test Results for:</b> 21 Z2R BSP REACH (21P2P)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
85.00	89.634	3.234	16.000	16.000	-0.00	PASS	
115.00	89.634	3.747	13.812	13.856	-0.32	PASS	
55.00	89.634	3.734	13.857	13.856	0.01	PASS	



<b>Relay Test Results for:</b> 21 Z2O BSP REACH (21P2P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21 Z2D BSP DELAY (21P2T)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1C BSP REACH (21C1P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1CO BSP REACH (21C1P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C 50PP1 PICKUP (50PP1)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1CD BSP DELAY (21C1T)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z2C BSP REACH (21C2P)							
						OK? RAN	

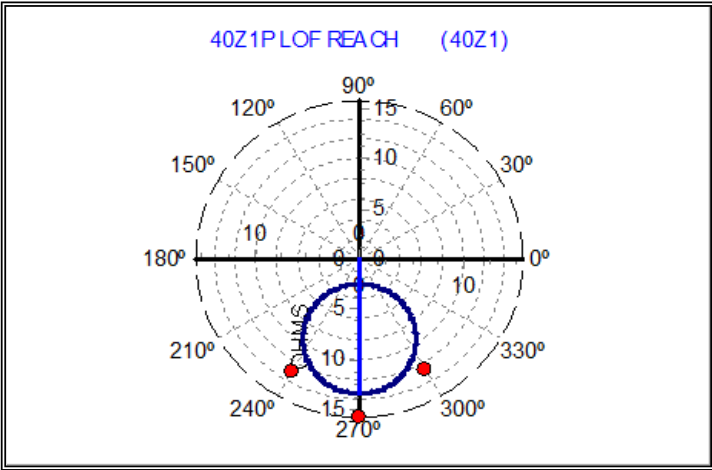
<b>Relay Test Results for:</b> 21C Z2CO BSP REACH (21C2P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C 50PP2 PICKUP (50PP2)							
						OK? RAN	

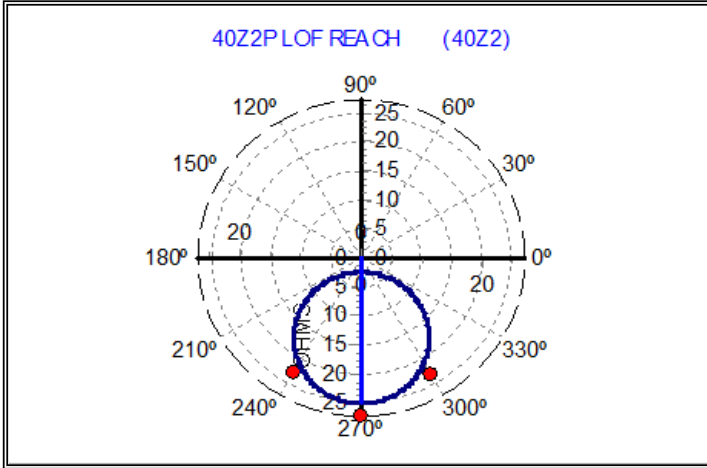
<b>Relay Test Results for:</b> 21C Z2CD BSP DELAY (21C2T)							
						OK? RAN	

<b>Relay Test Results for:</b> 24D1P V/HZ PICKUP (24D1)							
PICKUP	VOLTS	IDEAL	%ERROR		OK?		
121.957		120.750	1.00		PASS		

<b>Relay Test Results for:</b> 24D1D V/HZ DELAY (24D1T)																
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?										
1.20	144.900	62.65	1.044	0.925 TO 1.075		PASS										
<b>Relay Test Results for:</b> 24D2P1 V/HZ PICKUP (24C2)																
						OK? RAN										
<b>Relay Test Results for:</b> 24D2D1 V/HZ DELAY (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24D2D2 V/HZ DELAY (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ PICKUP (24C2)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ CURVE (24C2T)																
						OK? RAN										
<b>Relay Test Results for:</b> 24IP (ID) V/HZ PICKUP (24C2)																
	PICKUP VOLTS	IDEAL	%ERROR			OK?										
	121.957	120.750	1.00			PASS										
<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)																
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?										
1.10	132.825	619.51	10.325	9.475 TO 10.525		PASS										
1.20	144.900	155.27	2.588	2.350 TO 2.650		PASS										
1.30	156.975	70.17	1.169	1.031 TO 1.192		PASS										
1.50	181.125	26.80	0.442	0.355 TO 0.445		PASS										
<table border="1"> <caption>Data for 24IP (ID) V/HZ CURVE (24C2T)</caption> <thead> <tr> <th>MULTIPLE OF TAP</th> <th>TIME (SEC)</th> </tr> </thead> <tbody> <tr><td>1.10</td><td>10.325</td></tr> <tr><td>1.20</td><td>2.588</td></tr> <tr><td>1.30</td><td>1.169</td></tr> <tr><td>1.50</td><td>0.442</td></tr> </tbody> </table>							MULTIPLE OF TAP	TIME (SEC)	1.10	10.325	1.20	2.588	1.30	1.169	1.50	0.442
MULTIPLE OF TAP	TIME (SEC)															
1.10	10.325															
1.20	2.588															
1.30	1.169															
1.50	0.442															
<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)																
	PICKUP VOLTS	IDEAL	%ERROR			OK?										
	53.460	54.000	-1.00			PASS										
<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)																
						OK? RAN										
<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)																
						OK? RAN										

<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
		53.442	53.982	-1.00	PASS		
<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
		53.982	53.982	-0.00	PASS		
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH		0.250	0.250	0.00	PASS		
<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.300	1201.89	20.032	18.975 TO 21.025	PASS		
<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH		0.500	0.500	0.00	PASS		
<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.600	302.04	5.034	4.725 TO 5.275	PASS		
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	2.109	15.741	15.900	-1.00	PASS	
300.00	33.198	2.612	12.710	12.839	-1.00	PASS	
240.00	33.198	2.586	12.837	12.839	-0.01	PASS	
							
<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	13.280	2.500	2.500	-0.00	PASS	
<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 40Z2P LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	1.220	27.221	27.500	-1.02	PASS	
300.00	33.198	1.444	22.989	22.990	-0.01	PASS	
240.00	33.198	1.458	22.761	22.990	-1.00	PASS	



<b>Relay Test Results for:</b> 40XD2 LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	13.280	2.500	2.500	-0.00	PASS	

<b>Relay Test Results for:</b> 40Z2D LOF DELAY (40Z2T)							
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?		
27.50	22.92	32.90	0.548	0.425 TO 0.575	PASS		

<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)							
PICKUP	CURRENT	IDEAL	%ERROR	OK?			
1.212	1.200	1.00	PASS				

<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	1.440	1802.99	30.050	28.450 TO 31.550	PASS		

<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)							
PICKUP	CURRENT	IDEAL	%ERROR	OK?			
1.212	1.200	1.00	PASS				

<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)							
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?			
15.000	603.27	10.055	9.450 TO 10.550	PASS			

<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)							
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?			
7.500	2406.28	40.105	37.950 TO 42.050	PASS			

<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)							
						OK? RAN	

<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)							
						OK? RAN	

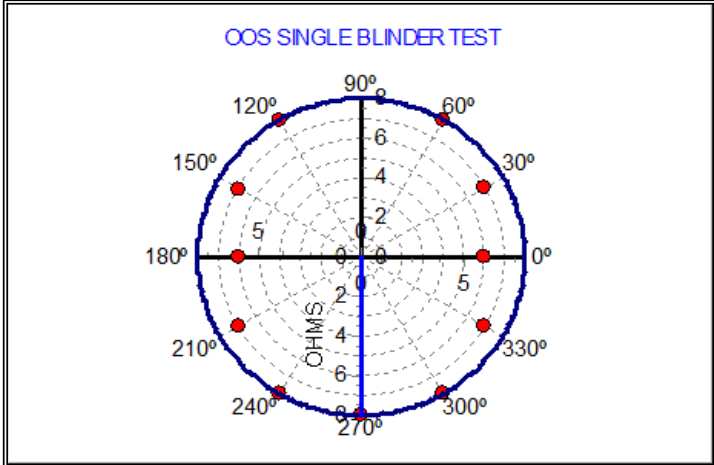
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)							
						OK? RAN	

<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)							
						OK? RAN	

<b>Relay Test Results for:</b>	50G1P OC PICKUP	(50G1)	OK? RAN
<b>Relay Test Results for:</b>	50G1D OC DELAY	(50G1T)	OK? RAN
<b>Relay Test Results for:</b>	50G2P OC PICKUP	(50G2)	OK? RAN
<b>Relay Test Results for:</b>	50G2D OC DELAY	(50G2T)	OK? RAN
<b>Relay Test Results for:</b>	51GP OC PICKUP	(51G)	OK? RAN
<b>Relay Test Results for:</b>	51G OC TIMING	(51GT)	OK? RAN
<b>Relay Test Results for:</b>	51CP OC PICKUP	(51C)	OK? RAN
<b>Relay Test Results for:</b>	51C OC TIMING	(51CT)	OK? RAN
<b>Relay Test Results for:</b>	51VP (100%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51VP (75%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51V (100%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	51V (75%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	59P1P OV PICKUP	(59P1)	OK? RAN
<b>Relay Test Results for:</b>	59P2P OV PICKUP	(59P2)	OK? RAN
<b>Relay Test Results for:</b>	59G1P OV PICKUP	(59G1)	OK? RAN
<b>Relay Test Results for:</b>	59G2P OV PICKUP	(59G2)	OK? RAN
<b>Relay Test Results for:</b>	59Q1P OV PICKUP	(59Q)	OK? RAN

<b>Relay Test Results for:</b>	59V1P OV PICKUP	(59V1)							OK? RAN
<b>Relay Test Results for:</b>	59PP1 OV PICKUP	(59PP1)							OK? RAN
<b>Relay Test Results for:</b>	59PP2 OV PICKUP	(59PP2)							OK? RAN
<b>Relay Test Results for:</b>	27B81P	FREQ INHIBIT	(27B81)						
	PICKUP	VOLTS	IDEAL	%ERROR					OK? PASS
		20.000	20.000	0.00					
<b>Relay Test Results for:</b>	81D1P	FREQ PICKUP	(81D1)						
	PICKUP	HZ	IDEAL	RANGE					OK? PASS
		59.090	59.100	59.050 TO 59.150					
<b>Relay Test Results for:</b>	81D1D	FREQ DELAY	(81D1T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE					OK? PASS
	58.900	4.49	0.076	0.000 TO 0.093					
<b>Relay Test Results for:</b>	81D2P	FREQ PICKUP	(81D2)						OK? RAN
<b>Relay Test Results for:</b>	81D2D	FREQ DELAY	(81D2T)						OK? RAN
<b>Relay Test Results for:</b>	81D3P	FREQ PICKUP	(81D3)						OK? RAN
<b>Relay Test Results for:</b>	81D3D	FREQ DELAY	(81D3T)						OK? RAN
<b>Relay Test Results for:</b>	81D4P	FREQ PICKUP	(81D4)						OK? RAN
<b>Relay Test Results for:</b>	81D4D	FREQ DELAY	(81D4T)						OK? RAN
<b>Relay Test Results for:</b>	81D5P	FREQ PICKUP	(81D5)						OK? RAN
<b>Relay Test Results for:</b>	81D5D	FREQ DELAY	(81D5T)						OK? RAN
<b>Relay Test Results for:</b>	81D6P	FREQ PICKUP	(81D6)						OK? RAN
<b>Relay Test Results for:</b>	81D6D	FREQ DELAY	(81D6T)						OK? RAN

<b>Relay Test Results for:</b> OOS SINGLE BLINDER TEST						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	26.552	1.925	7.962	8.000	-0.48	PASS
300.00	26.552	1.925	7.962	8.000	-0.48	PASS
330.00	26.552	2.213	6.928	6.928	-0.00	PASS
360.00	26.552	2.555	6.000	6.000	0.01	PASS
30.00	26.552	2.213	6.928	6.928	-0.00	PASS
60.00	26.552	1.916	8.002	8.000	0.02	PASS
240.00	26.552	1.916	8.002	8.000	0.02	PASS
210.00	26.552	2.213	6.928	6.928	-0.00	PASS
180.00	26.552	2.567	5.971	6.000	-0.49	PASS
150.00	26.552	2.224	6.894	6.928	-0.50	PASS
120.00	26.552	1.916	8.002	8.000	0.02	PASS



<b>Relay Test Results for:</b> OOS TWO BLINDER INNER TEST						
						OK?
						RAN

<b>Relay Test Results for:</b> OOS TWO BLINDER OUTER TEST						
						OK?
						RAN

<b>Relay Test Results for:</b> OOS TIMING (OOST)						
						OK?
						RAN

<b>Relay Test Results for:</b> 50N1P NEUT PICKUP (50N1)						
PICKUP	CURRENT	IDEAL	%ERROR			OK?
	2.500	2.500	-0.00			PASS

<b>Relay Test Results for:</b> 50N1D NEUT DELAY (50N1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		
1.20	3.000	7.31	0.122	0.070 TO 0.130		PASS

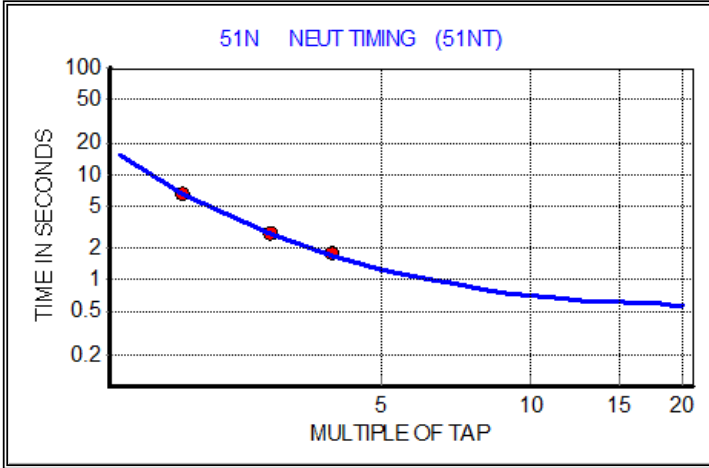
<b>Relay Test Results for:</b> 50N2P NEUT PICKUP (50N2)						
						OK?
						RAN

<b>Relay Test Results for:</b> 50N2D NEUT DELAY (50N2T)						
						OK?
						RAN

<b>Relay Test Results for:</b> 51NP NEUT PICKUP (51N)						
PICKUP	CURRENT	IDEAL	%ERROR			OK?
	0.500	0.500	0.00			PASS



<b>Relay Test Results for:</b> 51N NEUT TIMING (51NT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	1.000	390.61	6.510	6.490	0.31	PASS	
3.00	1.500	166.24	2.771	2.771	-0.02	PASS	
4.00	2.000	104.16	1.736	1.730	0.35	PASS	



<b>Relay Test Results for:</b> 50H1P OC PICKUP (50H1)	OK? RAN
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<b>Relay Test Results for:</b> 50H1D OC DELAY (50H1T)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PA OC PICKUP (50H2A)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PB OC PICKUP (50H2B)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PC OC PICKUP (50H2C)	OK? RAN
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<b>Relay Test Results for:</b> 50H2D OC DELAY (50H2T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1P OC PICKUP (50Q1)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1D OC DELAY (50Q1T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2P OC PICKUP (50Q2)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2D OC DELAY (50Q2T)	OK? RAN
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<b>Relay Test Results for:</b> 50R1P OC PICKUP (50R1)	OK? RAN
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<b>Relay Test Results for:</b>	50R1D	OC DELAY	(50R1T)						OK? RAN
<b>Relay Test Results for:</b>	50R2P	OC PICKUP	(50R2)						OK? RAN
<b>Relay Test Results for:</b>	50R2D	OC DELAY	(50R2T)						OK? RAN
<b>Relay Test Results for:</b>	U87P APH PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87A PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P APH PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	O87P 87A PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	SLP1 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	14.400	9.60	9.60	9.12 TO 10.08					PASS
<b>Relay Test Results for:</b>	SLP2 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	22.500	13.50	13.50	12.82 TO 14.18					PASS
<b>Relay Test Results for:</b>	U87P BPH PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87B PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P BPH PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	O87P 87B PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	SLP1 BPH DIFF TEST		(87R2)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	14.400	9.60	9.60	9.12 TO 10.08					PASS
<b>Relay Test Results for:</b>	SLP2 BPH DIFF TEST		(87R2)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	22.500	13.50	13.50	12.82 TO 14.18					PASS
<b>Relay Test Results for:</b>	U87P CPH PICKUP		(87U3)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					

<b>Relay Test Results for:</b>	U87P 87C PICKUP	(87U3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	50.000	50.000	0.00	PASS				
<b>Relay Test Results for:</b>	O87P CPH PICKUP	(87R3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	1.500	1.500	-0.00	PASS				
<b>Relay Test Results for:</b>	O87P 87C PICKUP	(87R3)						
	PICKUP CURRENT	IDEAL	%ERROR	OK?				
	1.500	1.500	-0.00	PASS				
<b>Relay Test Results for:</b>	SLP1 CPH DIFF TEST	(87R3)						
	RESTRAINT OPERATE	IDEAL	RANGE	OK?				
	CURRENT	CURRENT						
	22.500	13.50	13.50	12.82 TO 14.18	PASS			
<b>Relay Test Results for:</b>	SLP2 CPH DIFF TEST	(87R3)						
	RESTRAINT OPERATE	IDEAL	RANGE	OK?				
	CURRENT	CURRENT						
	22.500	13.50	13.50	12.82 TO 14.18	PASS			
<b>Relay Test Results for:</b>	RESTORE LOGIC SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	RESTORE PORT SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	COMPARE AF TO AL SETTINGS						OK?	
							RAN	
<b>Relay Test Results for:</b>	LOG OUT OF RELAY						OK?	
							RAN	

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> Pass	
<b>Lib Version:</b>	<b>Test Date:</b> 12/11/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert.#90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 3 Group 1	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB:		
Serial_Number: 2007325071			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: 0	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/18/2013		
Approved_By:			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH" 'BREAKER ACCESS LEVEL TO CHANGE GROUPS			
SET_GROUP\$="1" 'RELAY SET GROUP TO TEST			
CONTACT\$="103" 'OUTPUT CONTACT TO MASK			
SEL_AUTO=1 '0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES			
SKIP_TST=1 'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED			
NO_TOE=0 'NO ERROR MESSAGE IF NO OPERATION			
PRINT_RAN_TESTS=1 'PRINT RESULTS FOR ALL TESTS ATTEMPTED			
NORM_FREQ=60 'NORMAL VOLTAGE FREQUENCY			
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$= "GENERATOR"	TID\$= "TERMINAL"	CTR= 40	
CTRD= 40	CTRN= 40	PTR= 103.90	
PTRN= 103.90	VNOM= 120.0	INOM= 2.9	
EBUP\$= "V"	E24\$= "Y"	E27\$= "Y"	
E32\$= "Y"	E40\$= "Y"	E46\$= "Y"	
E50\$= "Y"	E50_87\$= "N"	E51\$= "Y"	
E59\$= "Y"	E64\$= "Y"	E78\$= "1B"	
E81= 1	E81AC= 6	E87\$= "N"	
ESV= 6	ESL= 5	EDEM\$= "ROL"	
s24D1P= 105	s24D1D= 1.00	s24CCS\$= "ID"	
s24IP= 105	s24IC= 2.0	s24ITD= 0.1	
s24D2P2= 176	s24D2D2= 3.00	s24CR= 240.00	
s24TC\$= "!60LOP"	s27P1P= 54.0	s27P2P\$= "OFF"	
s27V1P\$= "OFF"	s27PP1= 93.5	s27PP2= 93.5	
s32P1P= -0.0500	s32P1D= 20.00	s32P2P= -0.1000	
s32P2D= 5.00	s32PTC\$= "!60LOP"	s40Z1P= 13.4	
s40XD1= -2.5	s40Z1D= 0.00	s40Z2P= 25.0	
s40XD2= -2.5	s40Z2D= 0.50	s40ZTC\$= "!60LOP"	
s46Q1P= 8	s46Q1D= 30.00	s46Q2P= 8	
s46Q2K= 10	s46QTC= 1	s50P1P= 37.50	
s50P1D= 0.00	s50P2P\$= "OFF"	s50N1P\$= "OFF"	

Relay Results (continued) for: SEL-300G.FST1977712112013AL

s50N2P\$=	"OFF"	s50G1P=	3.00	s50G1D=	0.00
s50G2P\$=	"OFF"	s51NP=	1.00	s51NC\$=	"U2"
s51NTD=	5.00	s51NRS\$=	"N"	s51NTC=	1
s51GP\$=	"OFF"	s51VCA=	0	s51VP=	4.35
s51VC\$=	"U1"	s51VTD=	6.70	s51VRS\$=	"N"
s51VTC\$=	"!60LOP"	s3POD=	0.00	s50LP=	0.25
s52A\$=	"IN101"	s59P1P=	135.0	s59P2P\$=	"OFF"
s59G1P=	135.0	s59G2P\$=	"OFF"	s59QP\$=	"OFF"
s59V1P\$=	"OFF"	s59PP1\$=	"OFF"	s59PP2\$=	"OFF"
s64G1P=	5.0	s64G1D=	2.00	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	2.00	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"50P1T + 51VT + 87U +
87R"					
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
+ /64G2+ /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND+ /BNDT + /INAD"				OUT101\$=	"SV3"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BND+ BNDT + !(DCLO * DCHI)SCEUSE"					
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50
IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"

SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSTCT\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSTCT\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSTCT\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

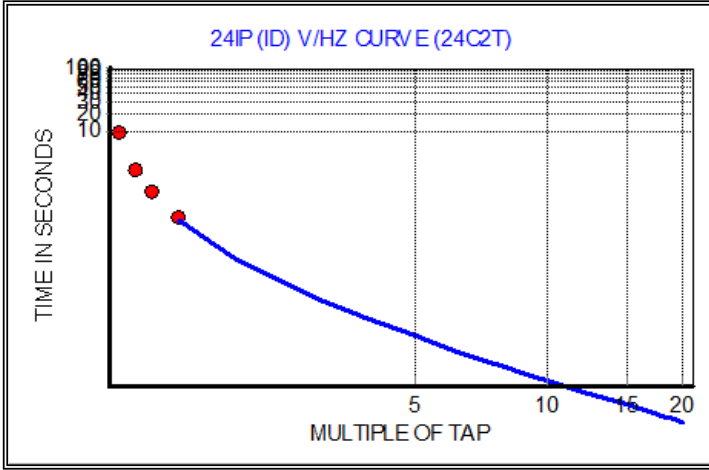
FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

<b>Relay Test Results for:</b> RELAY STATUS CHECK									
GENERATOR		DATE: 12/11/13		TIME: 12:03:46.908					
TERMINAL									
FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607						CID=E6A7			
	IA	IB	IC	IN	VA	VB	VC	VN	MOF
OS	1	0	-1	-2	-1	3	1	1	-1
	IA87	IB87	IC87						
OS	-2	0	1						
	+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS	5.02	5.01	-5.03	11.94	-12.11	14.94	-15.16		
	TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
	42.1	OK	OK	OK	OK	OK	OK		
	42.1	OK	OK	OK	OK	OK	OK		
<b>Relay Test Results for:</b> METER TEST									
	APPLIED	APPLIED	CURRENT						
	SEC VOLT	SEC AMP	PH LAG						
	69.28	2.00	30.00						
PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?		
	PRI KV	PRI KV		PRI CUR	PRI CUR				
A-N	7.0	7.0	0.1	72.0	72.2	0.2	PASS		
B-N	7.2	7.2	0.0	80.0	80.2	0.2	PASS		
C-N	7.4	7.4	0.1	88.0	88.2	0.2	PASS		
	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?		
	MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR				
	1.5	1.5	0.4	0.9	0.9	0.2	PASS		
<b>Relay Test Results for:</b> 21 Z1R BSP REACH (21P1P)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21 Z1O BSP REACH (21P1P)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21 Z1D BSP DELAY (21P1T)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21 Z2R BSP REACH (21P2P)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21 Z2O BSP REACH (21P2P)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21 Z2D BSP DELAY (21P2T)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21C Z1C BSP REACH (21C1P)									
							OK?		
							RAN		
<b>Relay Test Results for:</b> 21C Z1CO BSP REACH (21C1P)									
							OK?		
							RAN		

<b>Relay Test Results for:</b>	21C 50PP1 PICKUP	(50PP1)						OK? RAN
<b>Relay Test Results for:</b>	21C Z1CD BSP DELAY	(21C1T)						OK? RAN
<b>Relay Test Results for:</b>	21C Z2C BSP REACH	(21C2P)						OK? RAN
<b>Relay Test Results for:</b>	21C Z2CO BSP REACH	(21C2P)						OK? RAN
<b>Relay Test Results for:</b>	21C 50PP2 PICKUP	(50PP2)						OK? RAN
<b>Relay Test Results for:</b>	21C Z2CD BSP DELAY	(21C2T)						OK? RAN
<b>Relay Test Results for:</b>	24D1P V/HZ PICKUP	(24D1)						OK? RAN
	PICKUP VOLTS	IDEAL	%ERROR					OK? PASS
	126.000	126.000	0.00					
<b>Relay Test Results for:</b>	24D1D V/HZ DELAY	(24D1T)						OK? RAN
	MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE			OK?
	1.20	151.200	62.71	1.045	0.925 TO 1.075			PASS
<b>Relay Test Results for:</b>	24D2P1 V/HZ PICKUP	(24C2)						OK? RAN
<b>Relay Test Results for:</b>	24D2D1 V/HZ DELAY	(24C2T)						OK? RAN
<b>Relay Test Results for:</b>	24D2D2 V/HZ DELAY	(24C2T)						OK? RAN
<b>Relay Test Results for:</b>	24IP (I) V/HZ PICKUP	(24C2)						OK? RAN
<b>Relay Test Results for:</b>	24IP (I) V/HZ CURVE	(24C2T)						OK? RAN
<b>Relay Test Results for:</b>	24IP (ID) V/HZ PICKUP	(24C2)						OK? RAN
	PICKUP VOLTS	IDEAL	%ERROR					OK? PASS
	126.000	126.000	0.00					



<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.10	138.600	570.29	9.505	9.475 TO 10.525		PASS
1.20	151.200	148.25	2.471	2.350 TO 2.650		PASS
1.30	163.800	67.77	1.129	1.031 TO 1.192		PASS
1.50	189.000	26.45	0.441	0.355 TO 0.445		PASS



<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)					
PICKUP	VOLTS	IDEAL	%ERROR		OK?
	53.460	54.000	-1.00		PASS

<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)					
					OK?
					RAN

<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)					
					OK?
					RAN

<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)					
PICKUP	VOLTS	IDEAL	%ERROR		OK?
	53.442	53.982	-1.00		PASS

<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)					
PICKUP	VOLTS	IDEAL	%ERROR		OK?
	53.442	53.982	-1.00		PASS

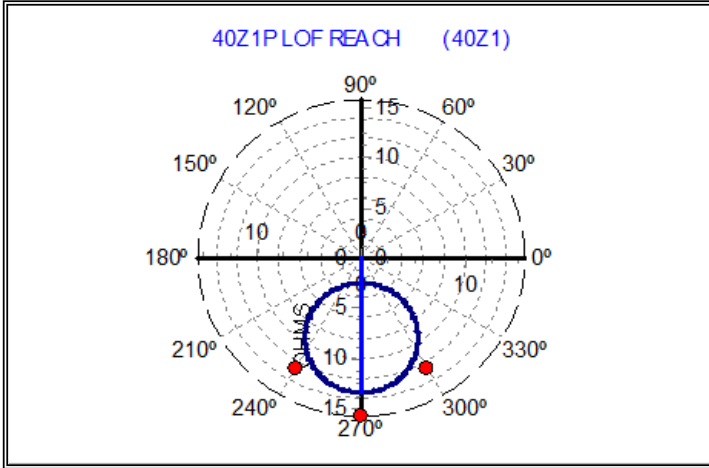
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)					
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?
3PH		0.145	0.145	0.34	PASS

<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	0.174	1201.91	20.032	18.975 TO 21.025		PASS

<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)					
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?
3PH		0.290	0.290	0.00	PASS

<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	0.348	302.12	5.035	4.725 TO 5.275		PASS

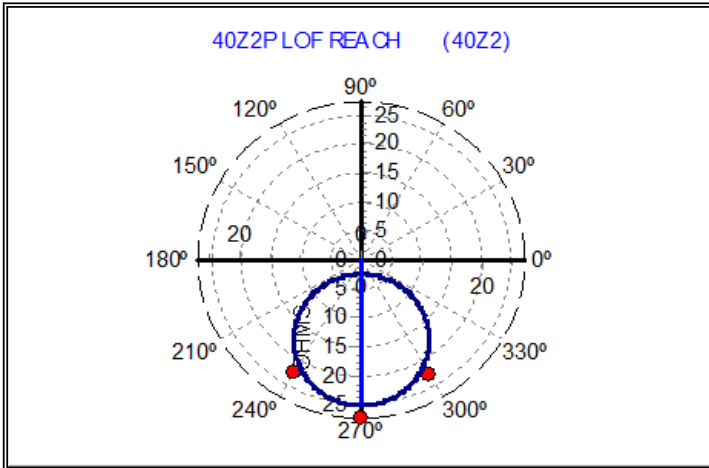
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	2.200	15.744	15.900	-0.98	PASS	
300.00	34.641	2.725	12.713	12.839	-0.98	PASS	
240.00	34.641	2.725	12.713	12.839	-0.98	PASS	



<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	13.856	2.500	2.500	0.00	PASS	

<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)						
						OK? RAN

<b>Relay Test Results for:</b> 40Z2P LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	1.272	27.238	27.500	-0.95	PASS	
300.00	34.641	1.522	22.767	22.990	-0.97	PASS	
240.00	34.641	1.537	22.544	22.990	-1.94	PASS	



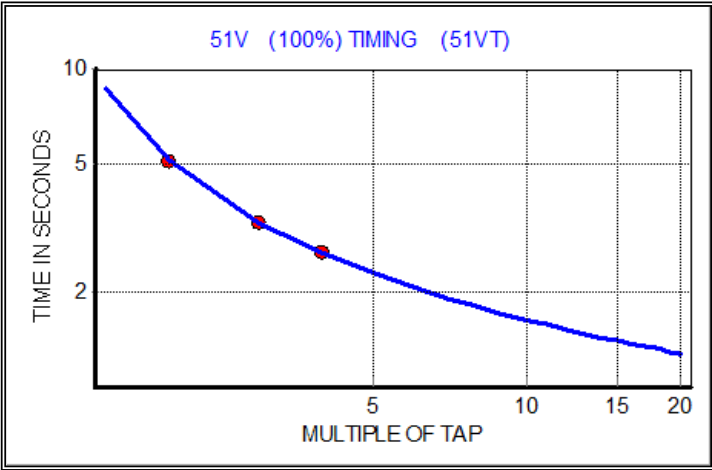
<b>Relay Test Results for:</b> 40XD2 LOF REACH (40Z2)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	34.641	13.856	2.500	2.500	0.00	PASS	

<b>Relay Test Results for:</b> 40Z2D LOF DELAY (40Z2T)						
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?	
27.50	22.92	33.31	0.555	0.425 TO 0.575	PASS	

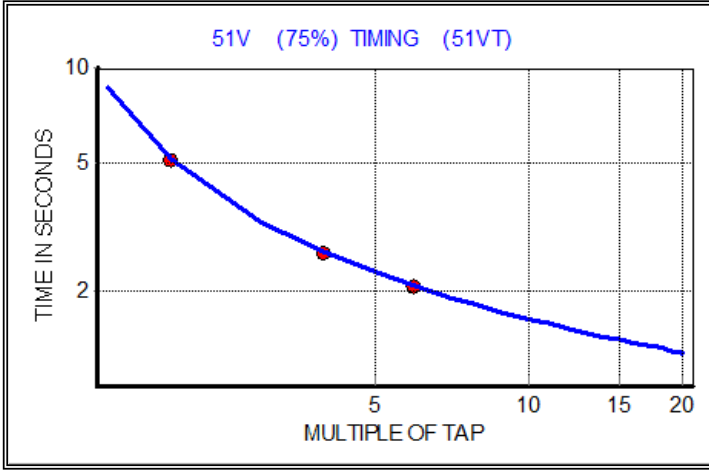
<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		0.703	0.696	0.96	PASS	
<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	0.835	1802.77	30.046	28.450 TO 31.550	PASS	
<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		0.696	0.696	-0.04	PASS	
<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
	8.700	603.17	10.053	9.450 TO 10.550	PASS	
<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
	4.350	2410.75	40.179	37.950 TO 42.050	PASS	
<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
A-N		37.500	37.500	0.00	PASS	
B-N		37.500	37.500	0.00	PASS	
C-N		37.500	37.500	0.00	PASS	
<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
50P1D OC DELAY (50P1T) (PHASE A-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.64	0.023	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE B-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.46	0.024	0.000 TO 0.025	PASS	
50P1D OC DELAY (50P1T) (PHASE C-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	45.000	1.29	0.021	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50G1P OC PICKUP (50G1)						
	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
		3.000	3.000	-0.00	PASS	
<b>Relay Test Results for:</b> 50G1D OC DELAY (50G1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	3.600	1.41	0.024	0.000 TO 0.025	PASS	
<b>Relay Test Results for:</b> 50G2P OC PICKUP (50G2)						
					OK?	
					RAN	
<b>Relay Test Results for:</b> 50G2D OC DELAY (50G2T)						
					OK?	
					RAN	

<b>Relay Test Results for:</b> 51GP OC PICKUP (51G)					OK?
					RAN
<b>Relay Test Results for:</b> 51G OC TIMING (51GT)					OK?
					RAN
<b>Relay Test Results for:</b> 51CP OC PICKUP (51C)					OK?
					RAN
<b>Relay Test Results for:</b> 51C OC TIMING (51CT)					OK?
					RAN
<b>Relay Test Results for:</b> 51VP (100%) PICKUP (51V)					
	PICKUP	CURRENT	IDEAL	%ERROR	OK?
		4.349	4.350	-0.01	PASS
<b>Relay Test Results for:</b> 51VP (75%) PICKUP (51V)					
	PICKUP	CURRENT	IDEAL	%ERROR	OK?
		3.262	3.263	-0.00	PASS

<b>Relay Test Results for:</b> 51V (100%) TIMING (51VT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	8.700	308.15	5.136	5.143	-0.14	PASS
3.00	13.050	196.84	3.281	3.288	-0.22	PASS
4.00	17.400	157.65	2.627	2.630	-0.09	PASS



<b>Relay Test Results for:</b> 51V (75%) TIMING (51VT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	6.525	308.36	5.139	5.143	-0.07	PASS
4.00	13.050	157.46	2.624	2.630	-0.21	PASS
6.00	19.575	123.53	2.059	2.061	-0.11	PASS



<b>Relay Test Results for:</b> 59P1P OV PICKUP (59P1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59P2P OV PICKUP (59P2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59G1P OV PICKUP (59G1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59G2P OV PICKUP (59G2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59Q1P OV PICKUP (59Q)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59V1P OV PICKUP (59V1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59PP1 OV PICKUP (59PP1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59PP2 OV PICKUP (59PP2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

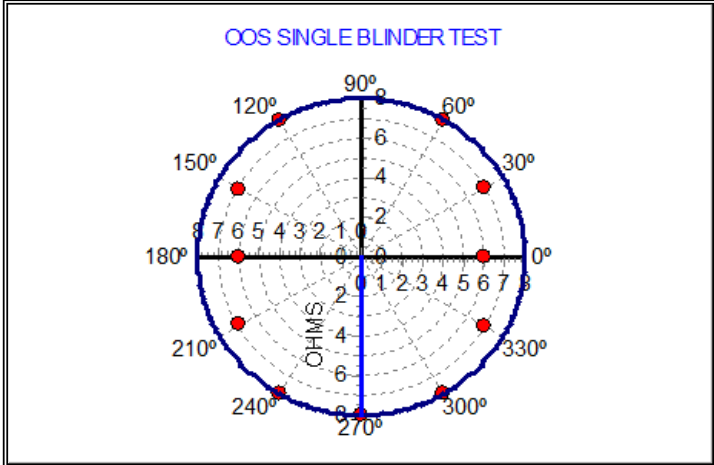
<b>Relay Test Results for:</b> 27B81P FREQ INHIBIT (27B81)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
19.800	20.000	-1.00	PASS			

<b>Relay Test Results for:</b> 81D1P FREQ PICKUP (81D1)						
PICKUP	HZ	IDEAL	RANGE	OK?		
59.090	59.100	59.050 TO 59.150	PASS			

<b>Relay Test Results for:</b> 81D1D FREQ DELAY (81D1T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
58.900	4.43	0.075	0.000 TO 0.093	PASS		

<b><u>Relay Test Results for:</u></b> 81D2P	FREQ PICKUP	(81D2)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D2D	FREQ DELAY	(81D2T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D3P	FREQ PICKUP	(81D3)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D3D	FREQ DELAY	(81D3T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D4P	FREQ PICKUP	(81D4)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D4D	FREQ DELAY	(81D4T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D5P	FREQ PICKUP	(81D5)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D5D	FREQ DELAY	(81D5T)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D6P	FREQ PICKUP	(81D6)	OK? RAN
<b><u>Relay Test Results for:</u></b> 81D6D	FREQ DELAY	(81D6T)	OK? RAN

<b>Relay Test Results for:</b>		OOS SINGLE BLINDER TEST					
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	27.706	2.010	7.958	8.000	-0.52	PASS	
300.00	27.706	2.000	7.998	8.000	-0.02	PASS	
330.00	27.706	2.308	6.929	6.928	0.02	PASS	
360.00	27.706	2.680	5.970	6.000	-0.51	PASS	
30.00	27.706	2.308	6.929	6.928	0.02	PASS	
60.00	27.706	2.000	7.998	8.000	-0.02	PASS	
240.00	27.706	2.000	7.998	8.000	-0.02	PASS	
210.00	27.706	2.320	6.895	6.928	-0.48	PASS	
180.00	27.706	2.680	5.970	6.000	-0.51	PASS	
150.00	27.706	2.320	6.895	6.928	-0.48	PASS	
120.00	27.706	2.000	7.998	8.000	-0.02	PASS	



<b>Relay Test Results for:</b>	OOS TWO BLINDER INNER TEST	OK? RAN
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<b>Relay Test Results for:</b>	OOS TWO BLINDER OUTER TEST	OK? RAN
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<b>Relay Test Results for:</b>	OOS TIMING (OOST)	OK? RAN
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<b>Relay Test Results for:</b>	50N1P NEUT PICKUP (50N1)	OK? RAN
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<b>Relay Test Results for:</b>	RESTORE LOGIC SETTINGS	OK? RAN
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<b>Relay Test Results for:</b>	RESTORE PORT SETTINGS	OK? RAN
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<b>Relay Test Results for:</b>	COMPARE AF TO AL SETTINGS	OK? RAN
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<b>Relay Test Results for:</b>	LOG OUT OF RELAY	OK? RAN
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# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/11/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 3 Group 2	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325071	Firmware: SEL-300G.FST1375012112013AL		
Relay_ID: 0	NERC_Auditabile: 0		
NERC_SubNum: 0	Maint_Interval: 0		
Previous_TestDate: 12/10/2010	Current_TestDate: 12/11/2013		
Next_TestDate: 12/11/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="1"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=2	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$="GENERATOR"	TID\$="TERMINAL"	CTR=8000	
CTRD=8000	CTRN=1	PTR=120.00	
PTRN=1.00	VNOM=115.0	INOM=5.0	
PHROT\$="ABC"	EBUP\$="D"	ELE\$="N"	
E24\$="Y"	E27\$="Y"	E32\$="Y"	
E40\$="Y"	E46\$="Y"	E50\$="Y"	
E50_87\$="Y"	E51\$="Y"	E59\$="Y"	
E64\$="Y"	E78\$="2B"	E81=1	
E81AC=6	E87\$="N"	ESV=6	
ESL=5	EDEM\$="ROL"	Z1R=8.0	
Z10=0.0	MTA1=88	Z1CMP=0	
Z1D=0.00	Z2R=16.0	Z20=1.5	
MTA2=85	Z2CMP=-30	Z2D=2.00	
s21PTC\$="!3PO"	s24D1P=105	s24D1D=1.00	
s24CCS\$="I"	s24IP=105	s24IC=2.0	
s24ITD=0.1	s24CR=10.00	s24TC\$="!60LOP"	
s27P1P=54.0	s27P2P=55.0	s27V1P=58.0	
s27PP1=93.5	s27PP2=93.5	s32P1P=-0.0500	
s32P1D=20.00	s32P2P=-0.1000	s32P2D=5.00	
s32PTC\$="!60LOP"	s40Z1P=13.4	s40XD1=-2.5	
s40Z1D=0.00	s40Z2P=25.0	s40XD2=-2.5	
s40Z2D=0.50	s40ZTC\$="!60LOP"	s46Q1P=8	



s46Q1D=	30.00	s46Q2P=	8	s46Q2K=	10
s46QTC=	1	s50P1P=	1.00	s50P1D=	0.60
s50P2P=	2.00	s50P2D=	0.50	s50N1P=	2.50
s50N1D=	0.10	s50N2P=	3.00	s50N2D=	0.50
s50G1P=	1.00	s50G1D=	0.60	s50G2P=	2.00
s50G2D=	0.50	s50H1P=	1.00	s50H1D=	0.60
s50H2PA=	2.00	s50H2PB\$=	"OFF"	s50H2PC=	3.00
s50H2D=	0.50	s50Q1P=	2.00	s50Q1D=	0.60
s50Q2P=	3.00	s50Q2D=	0.50	s50R1P=	1.00
s50R1D=	0.60	s50R2P=	2.00	s50R2D=	0.50
s51NP=	0.50	s51NC\$=	"U2"	s51NTD=	3.00
s51NRS\$=	"Y"	s51NTC=	1	s51GP=	1.20
s51GC\$=	"U2"	s51GTD=	3.00	s51GRS\$=	"Y"
s51GTC=	1	s3POD=	0.00	s50LP=	0.25
s52A\$=	"IN101"	s59P1P=	74.0	s59P2P=	80.0
s59G1P=	10.0	s59G2P=	60.0	s59QP=	22.0
s59V1P=	60.0	s59PP1=	70.0	s59PP2=	72.0
s64G1P=	5.0	s64G1D=	0.75	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	0.08	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	10.0	s78R2=	6.0	s78D=	0.05
s78TD=	0.00	s78TDURD=	3.00	s50ABC=	0.25
OOSTC=	1	s27B81P=	20.00	s81D1P=	59.10
s81D1D=	0.03	UBND1=	59.5	LBND1=	58.8
TBND1=	3000.00	LBND2=	58.0	TBND2=	540.00
LBND3=	57.5	TBND3=	100.00	LBND4=	57.0
TBND4=	14.00	LBND5=	56.5	TBND5=	2.40
LBND6=	40.0	TBND6=	1.00	s62ACC=	0.16
ONLINE\$=	"!27B81 * !3PO"DMTC=	15	PDEMP=	5.50	
NDEMP=	1.00	GDEMP=	1.00	QDEMP=	2.50
INAD=	0	INADPU=	0.25	INADDO=	0.13
SV1\$=	"27V1 * 40Z2"	SV1PU=	0.25	SV1DO=	0.00
SV2\$=	"!50L * 27P1 * !IN102"	SV2PU=	2.00	SV2DO=	1.00
SV3\$=	"51NT + 50N1T + 51CT + 51VT + 64G1T + 64G2T + INADT + LT1* 32P2T"	SV3PU=			0.00
SV3DO=	0.00				
SV4\$=	"24C2T + 32P1T + 40Z1T + 40Z2T"	SV4PU=	0.00	SV4DO=	0.00
SV5=	0	SV5PU=	0.00	SV5DO=	0.00
SV6=	0	SV6PU=	0.00	SV6DO=	0.00
SET1\$=	"LB1 + RB1"	RST1\$=	"3PO"	SET2\$=	"INADT"
RST2\$=	"TRGTR"	SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"
SET4=	0	RST4=	1	SET5\$=	"SV4"
RST5\$=	"TRGTR"	TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"
ULTR1\$=	"3PO"	TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"
TR3\$=	"SV3 + LT1"	ULTR3\$=	"!TR3"	TR4\$=	"SV3"
ULTR4\$=	"!TR4"	CLEN=	1	CL=	0
ULCL=	1	CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1 + /64G2+ /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND+ /BNDT + /INAD"
OUT101\$=	"TRIP1"	OUT102\$=	"TRIP2"	OUT103\$=	"64G2T"
OUT104\$=	"TRIP4"	OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"
OUT107\$=	"24D1T + 46Q1T + BCW + BND+ BNDT + !(DCLO * DCHI)SCEUSE"	LER=			15
PRE=	4				

Relay Results (continued) for: SEL-300G.FST1375012112013AL

FP_TO=	15	DATE_F\$=	"MDY"	DCLOP\$=	"OFF"
DCHIP\$=	"OFF"	FNOM=	60	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50
IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"
SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	19200
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	0	P2_AUTO\$=	"N"	P2_RTSCSTS\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSCSTS\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	9600
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSCSTS\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

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# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/12/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392		Division: Full Power	
Backup Generator Bldg.			
Substation: Gen 3 Group 2	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325071			
Firmware: SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: 0	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36 MONTHS		
Previous_TestDate: 12/12/2010	Current_TestDate: 12/12/2013		
Next_TestDate: 12/12/2016	TestSet_CalDate: 11/19/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="2"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$="GENERATOR"	TID\$="TERMINAL"	CTR=100	
CTRD=100	CTRN=100	PTR=100.00	
PTRN=100.00	VNOM=115.0	INOM=5.0	
EBUP\$="D"	ELE\$="N"	E24\$="Y"	
E27\$="Y"	E32\$="Y"	E40\$="Y"	
E46\$="Y"	E50\$="Y"	E50_87\$="N"	
E51\$="Y"	E59\$="N"	E64\$="Y"	
E78\$="1B"	E81=1	E81AC=6	
E87\$="G"	ESV=6	ESL=5	
EDEM\$="ROL"	Z1R=8.0	Z1O=0.0	
MTA1=88	Z1CMP=0	Z1D=0.00	
Z2R=16.0	Z2O=0.0	MTA2=85	
Z2CMP=0	Z2D=0.00	s21PTC\$="!3PO"	
s24D1P=105	s24D1D=1.00	s24CCS\$="ID"	
s24IP=105	s24IC=2.0	s24ITD=0.1	
s24D2P2=176	s24D2D2=3.00	s24CR=240.00	
s24TC\$="!60LOP"	s27P1P=54.0	s27P2P\$="OFF"	
s27V1P\$="OFF"	s27PP1=93.5	s27PP2=93.5	
s32P1P=-0.0500	s32P1D=20.00	s32P2P=-0.1000	
s32P2D=5.00	s32PTC\$="!60LOP"	s40Z1P=13.4	
s40XD1=-2.5	s40Z1D=0.00	s40Z2P=25.0	

Relay Results (continued) for: SEL-300G.FST0644112122013AL

s40XD2=	-2.5	s40Z2D=	0.50	s40ZTC\$=	"!60LOP"
s46Q1P=	8	s46Q1D=	30.00	s46Q2P=	8
s46Q2K=	10	s46QTC=	1	s50P1P\$=	"OFF"
s50P2P\$=	"OFF"	s50N1P=	2.50	s50N1D=	0.10
s50N2P\$=	"OFF"	s50G1P\$=	"OFF"	s50G2P\$=	"OFF"
s51NP=	0.50	s51NC\$=	"U2"	s51NTD=	3.00
s51NRS\$=	"Y"	s51NTC=	1	s51GP\$=	"OFF"
s3POD=	0.00	s50LP=	0.25	s52A\$=	"IN101"
s64G1P=	5.0	s64G1D=	0.75	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	0.08	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
TAP1=	5.00	TAPD=	5.00	U87P=	10.0
O87P=	0.30	SLP1=	40	s87B=	0
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"51NT + 50N1T + 51CT +
51VT + 64G1T + 64G2T + INADT + LT1* 32P2T"					
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
+ /64G2+ /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND+ /BNDT + /INAD"				OUT101\$=	"TRIP1"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)SCEUSE"					
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50

IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"
SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSTCT\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSTCT\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSTCT\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

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**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

**Relay Test Results for:** RELAY STATUS CHECK

GENERATOR DATE: 12/12/13 TIME: 05:45:57.009  
 TERMINAL  
 FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607 CID=E6A7

IA	IB	IC	IN	VA	VB	VC	VN	MOF
OS 1	0	-2	-2	-1	3	1	1	-1
IA87	IB87	IC87						
OS -2	0	1						
+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS 5.02	5.01	-5.03	11.94	-12.11	14.94	-15.16		
TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
40.3	OK	OK	OK	OK	OK	OK		
40.3	OK	OK	OK	OK	OK	OK		

**Relay Test Results for:** METER TEST

APPLIED	APPLIED	CURRENT
SEC VOLT	SEC AMP	PH LAG
66.40	2.00	30.00

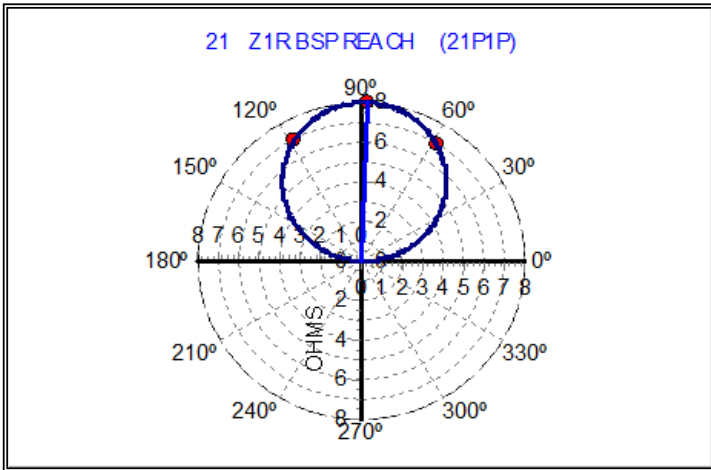
PHASE	CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
	PRI KV	PRI KV		PRI CUR	PRI CUR		
A-N	6.4	6.4	0.0	180.0	180.5	0.3	PASS
B-N	6.6	6.6	0.0	200.0	200.5	0.3	PASS
C-N	6.8	6.8	0.0	220.0	220.6	0.3	PASS

CALCULATED	MEASURED	% ERROR	CALCULATED	MEASURED	% ERROR	OK?
MEGA WATT	MEGA WATT		MEGA VAR	MEGA VAR		
3.5	3.5	0.4	2.0	2.0	0.3	PASS

**Relay Test Results for:** 21 Z1R BSP REACH (21P1P)

Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
88.00	89.634	6.469	8.000	8.000	-0.00	PASS
118.00	89.634	7.470	6.928	6.928	-0.01	PASS
58.00	89.634	7.470	6.928	6.928	-0.01	PASS



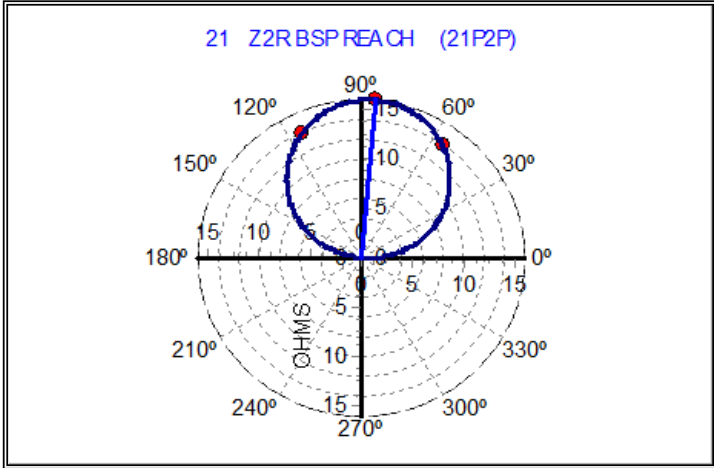
**Relay Test Results for:** 21 Z1O BSP REACH (21P1P)

OK?  
RAN

**Relay Test Results for:** 21 Z1D BSP DELAY (21P1T)

OK?  
RAN

<b>Relay Test Results for:</b> 21 Z2R BSP REACH (21P2P)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
85.00	89.634	3.234	16.000	16.000	-0.00	PASS	
115.00	89.634	3.747	13.812	13.856	-0.32	PASS	
55.00	89.634	3.734	13.857	13.856	0.01	PASS	



<b>Relay Test Results for:</b> 21 Z2O BSP REACH (21P2P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21 Z2D BSP DELAY (21P2T)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1C BSP REACH (21C1P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1CO BSP REACH (21C1P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C 50PP1 PICKUP (50PP1)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z1CD BSP DELAY (21C1T)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z2C BSP REACH (21C2P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z2CO BSP REACH (21C2P)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C 50PP2 PICKUP (50PP2)							
						OK? RAN	

<b>Relay Test Results for:</b> 21C Z2CD BSP DELAY (21C2T)							
						OK? RAN	

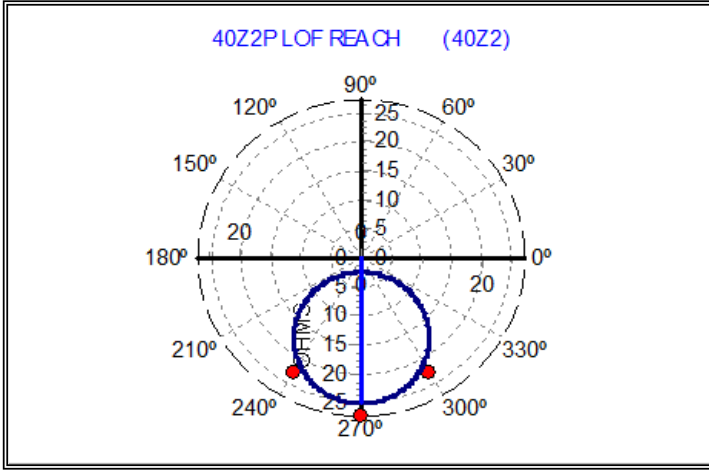
<b>Relay Test Results for:</b> 24D1P V/HZ PICKUP (24D1)							
PICKUP VOLTS		IDEAL		%ERROR		OK?	
121.957		120.750		1.00		PASS	

<b>Relay Test Results for:</b> 24D1D V/HZ DELAY (24D1T)																	
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?											
1.20	144.900	62.71	1.045	0.925 TO 1.075		PASS											
<b>Relay Test Results for:</b> 24D2P1 V/HZ PICKUP (24C2)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 24D2D1 V/HZ DELAY (24C2T)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 24D2D2 V/HZ DELAY (24C2T)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ PICKUP (24C2)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 24IP (I) V/HZ CURVE (24C2T)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 24IP (ID) V/HZ PICKUP (24C2)																	
	PICKUP VOLTS	IDEAL	%ERROR			OK?											
	121.957	120.750	1.00			PASS											
<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)																	
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?											
1.10	132.825	612.81	10.213	10.000	2.13	PASS											
1.20	144.900	154.31	2.572	2.500	2.88	PASS											
1.30	156.975	69.89	1.165	1.111	4.84	PASS											
1.50	181.125	26.76	0.440	0.400	0.00	PASS											
<table border="1"> <caption>Data for 24IP (ID) V/HZ CURVE (24C2T)</caption> <thead> <tr> <th>Multiple of Tap</th> <th>Time (Sec)</th> </tr> </thead> <tbody> <tr><td>1.10</td><td>10.213</td></tr> <tr><td>1.20</td><td>2.572</td></tr> <tr><td>1.30</td><td>1.165</td></tr> <tr><td>1.50</td><td>0.440</td></tr> </tbody> </table>								Multiple of Tap	Time (Sec)	1.10	10.213	1.20	2.572	1.30	1.165	1.50	0.440
Multiple of Tap	Time (Sec)																
1.10	10.213																
1.20	2.572																
1.30	1.165																
1.50	0.440																
<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)																	
	PICKUP VOLTS	IDEAL	%ERROR			OK?											
	53.460	54.000	-1.00			PASS											
<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)																	
						OK?	RAN										
<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)																	
						OK?	RAN										



<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
	53.442	53.982	-1.00	PASS			
<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)							
	PICKUP	VOLTS	IDEAL	%ERROR	OK?		
	53.442	53.982	-1.00	PASS			
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH	0.250	0.250	0.00	PASS			
<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.300	1202.01	20.034	18.975 TO 21.025	PASS		
<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)							
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?		
3PH	0.500	0.500	0.00	PASS			
<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
1.20	0.600	302.02	5.034	4.725 TO 5.275	PASS		
<b>Relay Test Results for:</b> 40Z1P LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	2.109	15.741	15.900	-1.00	PASS	
300.00	33.198	2.612	12.710	12.839	-1.00	PASS	
240.00	33.198	2.612	12.710	12.839	-1.00	PASS	
<b>Relay Test Results for:</b> 40XD1 LOF REACH (40Z1)							
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	33.198	13.280	2.500	2.500	-0.00	PASS	
<b>Relay Test Results for:</b> 40Z1D LOF DELAY (40Z1T)							
						OK?	
						RAN	

<b>Relay Test Results for:</b> 40Z2P LOF REACH (40Z2)						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	33.198	1.220	27.221	27.500	-1.02	PASS
300.00	33.198	1.458	22.761	22.990	-1.00	PASS
240.00	33.198	1.458	22.761	22.990	-1.00	PASS



<b>Relay Test Results for:</b> 40XD2 LOF REACH (40Z2)						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	33.198	13.280	2.500	2.500	-0.00	PASS

<b>Relay Test Results for:</b> 40Z2D LOF DELAY (40Z2T)						
SETTING Z	FAULT Z	TIME(CY)	TIME(SEC)	RANGE	OK?	
27.50	22.92	32.98	0.550	0.425 TO 0.575	PASS	

<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
1.212	1.200	1.00	PASS			

<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?	
1.20	1.440	1802.90	30.048	28.450 TO 31.550	PASS	

<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
1.212	1.200	1.00	PASS			

<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
15.000	603.37	10.056	9.450 TO 10.550	PASS		

<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						
APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE	OK?		
7.500	2406.31	40.105	37.950 TO 42.050	PASS		

<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						
OK?						
RAN						

<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
OK?						
RAN						

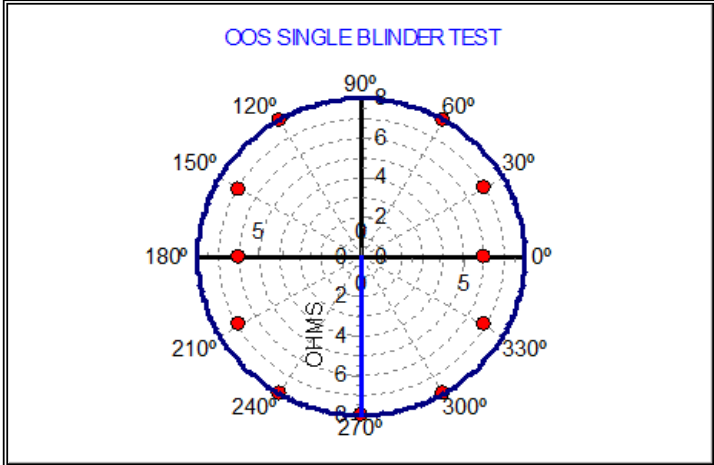
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
OK?						
RAN						

<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
OK?						
RAN						

<b>Relay Test Results for:</b>	50G1P OC PICKUP	(50G1)	OK? RAN
<b>Relay Test Results for:</b>	50G1D OC DELAY	(50G1T)	OK? RAN
<b>Relay Test Results for:</b>	50G2P OC PICKUP	(50G2)	OK? RAN
<b>Relay Test Results for:</b>	50G2D OC DELAY	(50G2T)	OK? RAN
<b>Relay Test Results for:</b>	51GP OC PICKUP	(51G)	OK? RAN
<b>Relay Test Results for:</b>	51G OC TIMING	(51GT)	OK? RAN
<b>Relay Test Results for:</b>	51CP OC PICKUP	(51C)	OK? RAN
<b>Relay Test Results for:</b>	51C OC TIMING	(51CT)	OK? RAN
<b>Relay Test Results for:</b>	51VP (100%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51VP (75%) PICKUP	(51V)	OK? RAN
<b>Relay Test Results for:</b>	51V (100%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	51V (75%) TIMING	(51VT)	OK? RAN
<b>Relay Test Results for:</b>	59P1P OV PICKUP	(59P1)	OK? RAN
<b>Relay Test Results for:</b>	59P2P OV PICKUP	(59P2)	OK? RAN
<b>Relay Test Results for:</b>	59G1P OV PICKUP	(59G1)	OK? RAN
<b>Relay Test Results for:</b>	59G2P OV PICKUP	(59G2)	OK? RAN
<b>Relay Test Results for:</b>	59Q1P OV PICKUP	(59Q)	OK? RAN

<b>Relay Test Results for:</b>	59V1P OV PICKUP	(59V1)							OK? RAN
<b>Relay Test Results for:</b>	59PP1 OV PICKUP	(59PP1)							OK? RAN
<b>Relay Test Results for:</b>	59PP2 OV PICKUP	(59PP2)							OK? RAN
<b>Relay Test Results for:</b>	27B81P FREQ INHIBIT	(27B81)							OK? PASS
	PICKUP VOLTS	IDEAL	%ERROR						
	19.800	20.000	-1.00						
<b>Relay Test Results for:</b>	81D1P FREQ PICKUP	(81D1)							OK? PASS
	PICKUP HZ	IDEAL	RANGE						
	59.090	59.100	59.050 TO 59.150						
<b>Relay Test Results for:</b>	81D1D FREQ DELAY	(81D1T)							OK? PASS
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE					
	58.900	4.49	0.076	0.000 TO 0.093					
<b>Relay Test Results for:</b>	81D2P FREQ PICKUP	(81D2)							OK? RAN
<b>Relay Test Results for:</b>	81D2D FREQ DELAY	(81D2T)							OK? RAN
<b>Relay Test Results for:</b>	81D3P FREQ PICKUP	(81D3)							OK? RAN
<b>Relay Test Results for:</b>	81D3D FREQ DELAY	(81D3T)							OK? RAN
<b>Relay Test Results for:</b>	81D4P FREQ PICKUP	(81D4)							OK? RAN
<b>Relay Test Results for:</b>	81D4D FREQ DELAY	(81D4T)							OK? RAN
<b>Relay Test Results for:</b>	81D5P FREQ PICKUP	(81D5)							OK? RAN
<b>Relay Test Results for:</b>	81D5D FREQ DELAY	(81D5T)							OK? RAN
<b>Relay Test Results for:</b>	81D6P FREQ PICKUP	(81D6)							OK? RAN
<b>Relay Test Results for:</b>	81D6D FREQ DELAY	(81D6T)							OK? RAN

<b>Relay Test Results for:</b> OOS SINGLE BLINDER TEST						
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
270.00	26.552	1.925	7.962	8.000	-0.48	PASS
300.00	26.552	1.916	8.002	8.000	0.02	PASS
330.00	26.552	2.224	6.894	6.928	-0.50	PASS
360.00	26.552	2.555	6.000	6.000	0.01	PASS
30.00	26.552	2.213	6.928	6.928	-0.00	PASS
60.00	26.552	1.916	8.002	8.000	0.02	PASS
240.00	26.552	1.916	8.002	8.000	0.02	PASS
210.00	26.552	2.224	6.894	6.928	-0.50	PASS
180.00	26.552	2.555	6.000	6.000	0.01	PASS
150.00	26.552	2.224	6.894	6.928	-0.50	PASS
120.00	26.552	1.916	8.002	8.000	0.02	PASS



<b>Relay Test Results for:</b> OOS TWO BLINDER INNER TEST	OK? RAN
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<b>Relay Test Results for:</b> OOS TWO BLINDER OUTER TEST	OK? RAN
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<b>Relay Test Results for:</b> OOS TIMING (OOST)	OK? RAN
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<b>Relay Test Results for:</b> 50N1P NEUT PICKUP (50N1)	
PICKUP CURRENT IDEAL %ERROR	OK?
2.500 2.500 -0.00	PASS

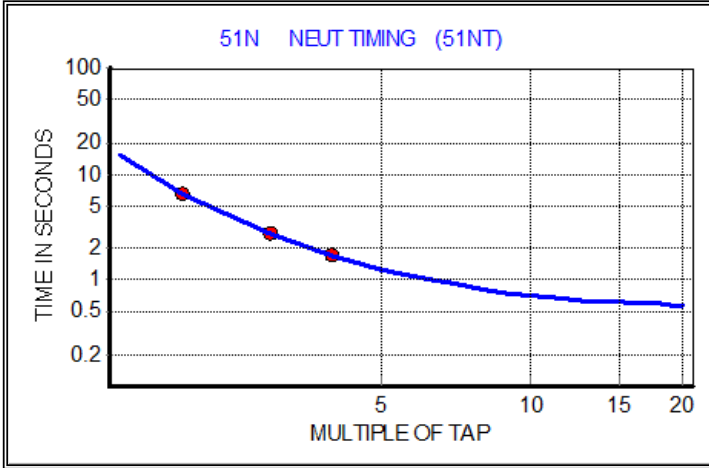
<b>Relay Test Results for:</b> 50N1D NEUT DELAY (50N1T)	
MULTIPLE VALUE TIME(CY) TIME(SEC) RANGE	OK?
1.20 3.000 7.59 0.127 0.070 TO 0.130	PASS

<b>Relay Test Results for:</b> 50N2P NEUT PICKUP (50N2)	OK? RAN
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<b>Relay Test Results for:</b> 50N2D NEUT DELAY (50N2T)	OK? RAN
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<b>Relay Test Results for:</b> 51NP NEUT PICKUP (51N)	
PICKUP CURRENT IDEAL %ERROR	OK?
0.500 0.500 0.00	PASS

<b>Relay Test Results for:</b> 51N NEUT TIMING (51NT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	1.000	392.09	6.535	6.490	0.69	PASS	
3.00	1.500	166.24	2.771	2.771	-0.02	PASS	
4.00	2.000	103.52	1.725	1.730	-0.27	PASS	



<b>Relay Test Results for:</b> 50H1P OC PICKUP (50H1)	OK? RAN
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<b>Relay Test Results for:</b> 50H1D OC DELAY (50H1T)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PA OC PICKUP (50H2A)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PB OC PICKUP (50H2B)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PC OC PICKUP (50H2C)	OK? RAN
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<b>Relay Test Results for:</b> 50H2D OC DELAY (50H2T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1P OC PICKUP (50Q1)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1D OC DELAY (50Q1T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2P OC PICKUP (50Q2)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2D OC DELAY (50Q2T)	OK? RAN
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<b>Relay Test Results for:</b> 50R1P OC PICKUP (50R1)	OK? RAN
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<b>Relay Test Results for:</b>	50R1D	OC DELAY	(50R1T)						OK? RAN
<b>Relay Test Results for:</b>	50R2P	OC PICKUP	(50R2)						OK? RAN
<b>Relay Test Results for:</b>	50R2D	OC DELAY	(50R2T)						OK? RAN
<b>Relay Test Results for:</b>	U87P APH PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87A PICKUP		(87U1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P APH PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.515	1.500	1.00					
<b>Relay Test Results for:</b>	O87P 87A PICKUP		(87R1)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	SLP1 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	14.400	9.60	9.60	9.12 TO 10.08					PASS
<b>Relay Test Results for:</b>	SLP2 APH DIFF TEST		(87R1)						
	RESTRAINT	OPERATE	IDEAL	RANGE					OK?
	CURRENT	CURRENT							
	22.500	13.50	13.50	12.82 TO 14.18					PASS
<b>Relay Test Results for:</b>	U87P BPH PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87B PICKUP		(87U2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.500	50.000	1.00					
<b>Relay Test Results for:</b>	O87P BPH PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	O87P 87B PICKUP		(87R2)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					
<b>Relay Test Results for:</b>	U87P CPH PICKUP		(87U3)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	U87P 87C PICKUP		(87U3)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		50.000	50.000	0.00					
<b>Relay Test Results for:</b>	O87P CPH PICKUP		(87R3)						
	PICKUP	CURRENT	IDEAL	%ERROR					OK? PASS
		1.500	1.500	-0.00					

Relay Results (continued) for: SEL-300G.FST0644112122013AL

<b>Relay Test Results for:</b>	O87P 87C PICKUP	(87R3)			
	PICKUP	CURRENT	IDEAL	%ERROR	OK?
		1.500	1.500	-0.00	PASS
<b>Relay Test Results for:</b>	RESTORE LOGIC SETTINGS				OK?
					RAN
<b>Relay Test Results for:</b>	RESTORE PORT SETTINGS				OK?
					RAN
<b>Relay Test Results for:</b>	COMPARE AF TO AL SETTINGS				OK?
					RAN
<b>Relay Test Results for:</b>	LOG OUT OF RELAY				OK?
					RAN



# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-300G.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 12/11/2013		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: Gen 4 Group 1	Terminal: VA Gainesville, Fla		
Phase_Zone: SEL-300G TOC	Relay_Manf: SEL		
Relay_Type: SEL-300G	Model_Style: 0300G105325XX4XXX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325072			
Firmware:SEL-300G-R325-V105325XX4XXX-Z301302-D20070607			
Relay_ID: Generator #2	NERC_Auditable: 0		
NERC_SubNum: 0	Maint_Interval: 36 MONTHS		
Previous_TestDate: 12/10/2010	Current_TestDate: 12/10/2013		
Next_TestDate: 12/10/2016	TestSet_CalDate: 11/18/2013		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
BAC\$="EDITH"	'BREAKER ACCESS LEVEL TO CHANGE GROUPS		
SET_GROUP\$="1"	'RELAY SET GROUP TO TEST		
CONTACT\$="103"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=0	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=1	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$="GENERATOR"	TID\$="TERMINAL"	CTR=40	
CTRD=40	CTRN=40	PTR=103.90	
PTRN=103.90	VNOM=120.0	INOM=2.9	
EBUP\$="V"	E24\$="Y"	E27\$="Y"	
E32\$="Y"	E40\$="Y"	E46\$="Y"	
E50\$="Y"	E50_87\$="N"	E51\$="Y"	
E59\$="Y"	E64\$="Y"	E78\$="1B"	
E81=1	E81AC=6	E87\$="N"	
ESV=6	ESL=5	EDEM\$="ROL"	
s24D1P=105	s24D1D=1.00	s24CCS\$="ID"	
s24IP=105	s24IC=2.0	s24ITD=0.1	
s24D2P2=176	s24D2D2=3.00	s24CR=240.00	
s24TC\$="!60LOP"	s27P1P=54.0	s27P2P\$="OFF"	
s27V1P\$="OFF"	s27PP1=93.5	s27PP2=93.5	
s32P1P=-0.0500	s32P1D=20.00	s32P2P=-0.1000	
s32P2D=5.00	s32PTC\$="!60LOP"	s40Z1P=13.4	
s40XD1=-2.5	s40Z1D=0.00	s40Z2P=25.0	
s40XD2=-2.5	s40Z2D=0.50	s40ZTC\$="!60LOP"	
s46Q1P=8	s46Q1D=30.00	s46Q2P=8	
s46Q2K=10	s46QTC=1	s50P1P=37.50	
s50P1D=0.00	s50P2P\$="OFF"	s50N1P\$="OFF"	

s50N2P\$=	"OFF"	s50G1P=	3.00	s50G1D=	0.00
s50G2P\$=	"OFF"	s51NP=	1.00	s51NC\$=	"U2"
s51NTD=	5.00	s51NRS\$=	"N"	s51NTC=	1
s51GP\$=	"OFF"	s51VCA=	0	s51VP=	4.35
s51VC\$=	"U1"	s51VTD=	6.70	s51VRS\$=	"N"
s51VTC\$=	"!60LOP"	s3POD=	0.00	s50LP=	0.25
s52A\$=	"IN101"	s59P1P=	135.0	s59P2P\$=	"OFF"
s59G1P=	135.0	s59G2P\$=	"OFF"	s59QP\$=	"OFF"
s59V1P\$=	"OFF"	s59PP1\$=	"OFF"	s59PP2\$=	"OFF"
s64G1P=	5.0	s64G1D=	2.00	s64G2P=	2.5
s64RAT=	1.0	s64G2D=	2.00	s64GTC=	1
s64FOPT\$=	"NONE"	s78FWD=	8.0	s78REV=	8.0
s78R1=	6.0	s78R2=	6.0	s78TD=	0.00
s78TDURD=	3.00	s50ABC=	0.25	OOSTC=	1
s27B81P=	20.00	s81D1P=	59.10	s81D1D=	0.03
UBND1=	59.5	LBND1=	58.8	TBND1=	3000.00
LBND2=	58.0	TBND2=	540.00	LBND3=	57.5
TBND3=	100.00	LBND4=	57.0	TBND4=	14.00
LBND5=	56.5	TBND5=	2.40	LBND6=	40.0
TBND6=	1.00	s62ACC=	0.16	ONLINE\$=	"!27B81 * !3PO"
DMTC=	15	PDEMP=	5.50	NDEMP=	1.00
GDEMP=	1.00	QDEMP=	2.50	INAD\$=	"SV2T * 50L"
INADPU=	0.25	INADDO=	0.13	SV1\$=	"27V1 * 40Z2"
SV1PU=	0.25	SV1DO=	0.00	SV2\$=	"!50L * 27P1 * !IN102"
SV2PU=	2.00	SV2DO=	1.00	SV3\$=	"50P1T + 51VT + 87U +
SV3PU=	0.00	SV3DO=	0.00	SV4\$=	"24C2T + 32P1T + 40Z1T +
40Z2T"					
SV4PU=	0.00	SV4DO=	0.00	SV5=	0
SV5PU=	0.00	SV5DO=	0.00	SV6=	0
SV6PU=	0.00	SV6DO=	0.00	SET1\$=	"LB1 + RB1"
RST1\$=	"3PO"	SET2\$=	"INADT"	RST2\$=	"TRGTR"
SET3\$=	"!(DCLO * DCHI)"	RST3\$=	"TRGTR"	SET4=	0
RST4=	1	SET5\$=	"SV4"	RST5\$=	"TRGTR"
TDURD=	0.16	TR1\$=	"SV3 + SV4 + 46Q2T + 81D1T + 81D2T"	ULTR1\$=	"3PO"
TR2\$=	"SV3 + SV4"	ULTR2\$=	"!TR2"	TR3\$=	"SV3 + LT1"
ULTR3\$=	"!TR3"	TR4\$=	"SV3"	ULTR4\$=	"!TR4"
CLEN=	1	CL=	0	ULCL=	1
CLSD=	0.00	ER\$=	"/24C2 + /32P1 + /46Q2 + /51N + /51C + /51V + /64G1		
			+ /64G2 + /60LOP + /81D1 + /81D2 + \81D1 + \81D2 + /BND + /BNDT + /INAD"	OUT101\$=	"SV3"
OUT102\$=	"TRIP2"	OUT103\$=	"TRIP3"	OUT104\$=	"TRIP4"
OUT105\$=	"CLOSE"	OUT106\$=	"60LOP"	OUT107\$=	"24D1T + 46Q1T + BCW +
BNDA + BNDT + !(DCLO * DCHI)	SCEUSE"				
LER=	15	PRE=	4	FP_TO=	15
DATE_F\$=	"MDY"	DCLOP\$=	"OFF"	DCHIP\$=	"OFF"
FNOM=	60	PHROT\$=	"ABC"	DELTA_Y\$=	"Y"
TGR=	3	SS1=	0	SS2=	0
BKMON\$=	"TRIP"	COSP1=	10000	COSP2=	150
COSP3=	12	KASP1=	1.2	KASP2=	8.0
KASP3=	20.0	IN101D=	0.50	IN102D=	0.50
IN103D=	0.50	IN104D=	0.50	IN105D=	0.50
IN106D=	0.50	NLB1\$=	"GEN SHUTDOWN"	CLB1\$=	"RETURN"

SLB1\$=	" "	PLB1\$=	"TRIP"	NLB2\$=	" "
NLB3\$=	" "	NLB4\$=	" "	NLB5\$=	" "
NLB6\$=	" "	NLB7\$=	" "	NLB8\$=	" "
NLB9\$=	" "	NLB10\$=	" "	NLB11\$=	" "
NLB12\$=	" "	NLB13\$=	" "	NLB14\$=	" "
NLB15\$=	" "	NLB16\$=	" "	FP_I\$=	"Y"
FP_VPP\$=	"Y"	FP_VP\$=	"N"	FP_MW\$=	"Y"
FP_FR\$=	"Y"	FP_87\$=	"N"	DP1\$=	"IN101"
DP1_1\$=	"GEN BKR CLOSED"	DP1_0\$=	"GEN BKR OPEN"	DP2\$=	"IN102"
DP2_1\$=	"FIELD BKR CLOSED"	DP2_0\$=	"FIELD BKR OPEN"	DP3\$=	"SG1"
DP3_1\$=	"GROUP 1 ACTIVE"	DP3_0\$=	"GROUP 2 ACTIVE"	DP4\$=	"SV2T"
DP4_1\$=	"INAD ARMED"	DP4_0\$=	" "	DP5\$=	"LT2"
DP5_1\$=	"INAD TRIP"	DP5_0\$=	" "	DP6\$=	"LT1"
DP6_1\$=	"SHUTDOWN TRIP"	DP6_0\$=	" "	DP7\$=	"LT5"
DP7_1\$=	"AB OP TRIP"	DP7_0\$=	" "	DP8=	0
DP8_1\$=	" "	DP8_0\$=	" "	DP9=	0
DP9_1\$=	" "	DP9_0\$=	" "	DP10=	0
DP10_1\$=	" "	DP10_0\$=	" "	DP11=	0
DP11_1\$=	" "	DP11_0\$=	" "	DP12=	0
DP12_1\$=	" "	DP12_0\$=	" "	DP13=	0
DP13_1\$=	" "	DP13_0\$=	" "	DP14=	0
DP14_1\$=	" "	DP14_0\$=	" "	DP15=	0
DP15_1\$=	" "	DP15_0\$=	" "	DP16=	0
DP16_1\$=	" "	DP16_0\$=	" "	P1_PROTO\$=	"SEL"
P1_SPEED=	2400	P1_BITS=	8	P1_PARITY\$=	"N"
P1_STOP=	1	P1_T_OUT=	15	P1_AUTO\$=	"N"
P1_FASTOP\$=	"N"	P2_PROTO\$=	"SEL"	P2_SPEED=	2400
P2_BITS=	8	P2_PARITY\$=	"N"	P2_STOP=	1
P2_T_OUT=	15	P2_AUTO\$=	"N"	P2_RTSCST\$=	"N"
P2_FASTOP\$=	"N"	P3_PROTO\$=	"SEL"	P3_SPEED=	2400
P3_BITS=	8	P3_PARITY\$=	"N"	P3_STOP=	1
P3_T_OUT=	15	P3_AUTO\$=	"N"	P3_RTSCST\$=	"N"
P3_FASTOP\$=	"N"	PF_PROTO\$=	"SEL"	PF_SPEED=	2400
PF_BITS=	8	PF_PARITY\$=	"N"	PF_STOP=	1
PF_T_OUT=	15	PF_AUTO\$=	"N"	PF_RTSCST\$=	"N"
PF_FASTOP\$=	"N"				

**Relay Test Results for:** LOG IN TO RELAY

OK?  
RAN

**Relay Test Results for:** DOWNLOAD RELAY SETTINGS

OK?  
RAN

**Relay Test Results for:** SET PORT TIMEOUT AND AUTO

OK?  
RAN

**Relay Test Results for:** UPDATE FIRMWARE

FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607      CID=E6A7

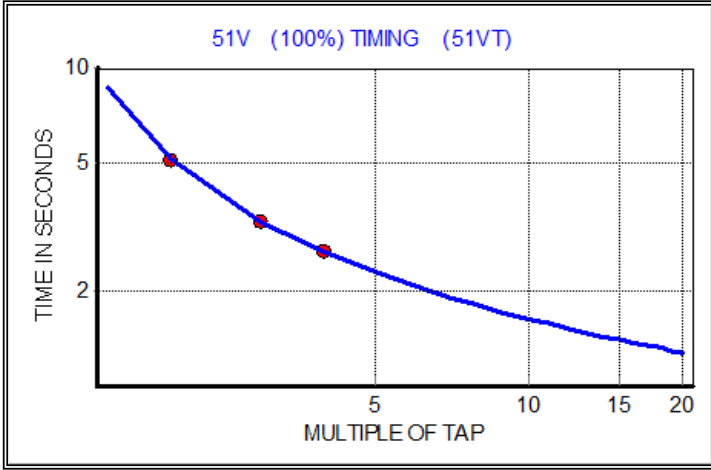
<b>Relay Test Results for:</b> RELAY STATUS CHECK									
GENERATOR		DATE: 12/11/13		TIME: 08:05:08.842					
TERMINAL									
FID=SEL-300G-R325-V105325XX4XXX-Z301302-D20070607						CID=E6A7			
IA	IB	IC	IN	VA	VB	VC	VN	MOF	
OS	0	0	1	1	-1	1	0	2	1
	IA87	IB87	IC87						
OS	-1	1	2						
	+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
PS	5.03	5.04	-4.96	12.05	-11.93	15.01	-15.19		
	TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
	41.1	OK	OK	OK	OK	OK	OK		
	41.1	OK	OK	OK	OK	OK	OK		
<b>Relay Test Results for:</b> 21 Z1R BSP REACH (21P1P)									
									OK? RAN
<b>Relay Test Results for:</b> 21 Z1O BSP REACH (21P1P)									
									OK? RAN
<b>Relay Test Results for:</b> 21 Z1D BSP DELAY (21P1T)									
									OK? RAN
<b>Relay Test Results for:</b> 21 Z2R BSP REACH (21P2P)									
									OK? RAN
<b>Relay Test Results for:</b> 21 Z2O BSP REACH (21P2P)									
									OK? RAN
<b>Relay Test Results for:</b> 21 Z2D BSP DELAY (21P2T)									
									OK? RAN
<b>Relay Test Results for:</b> 21C Z1C BSP REACH (21C1P)									
									OK? RAN
<b>Relay Test Results for:</b> 21C Z1CO BSP REACH (21C1P)									
									OK? RAN
<b>Relay Test Results for:</b> 21C 50PP1 PICKUP (50PP1)									
									OK? RAN
<b>Relay Test Results for:</b> 21C Z1CD BSP DELAY (21C1T)									
									OK? RAN
<b>Relay Test Results for:</b> 21C Z2C BSP REACH (21C2P)									
									OK? RAN
<b>Relay Test Results for:</b> 21C Z2CO BSP REACH (21C2P)									
									OK? RAN
<b>Relay Test Results for:</b> 21C 50PP2 PICKUP (50PP2)									
									OK? RAN

<b>Relay Test Results for:</b> 21C Z2CD BSP DELAY (21C2T)						OK?
						RAN
<b>Relay Test Results for:</b> 24D1P V/HZ PICKUP (24D1)						OK?
	PICKUP	VOLTS	IDEAL	%ERROR		PASS
	126.000		126.000	0.00		
<b>Relay Test Results for:</b> 24D1D V/HZ DELAY (24D1T)						OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		PASS
1.20	151.200	62.59	1.043	0.925 TO 1.075		
<b>Relay Test Results for:</b> 24D2P1 V/HZ PICKUP (24C2)						OK?
						RAN
<b>Relay Test Results for:</b> 24D2D1 V/HZ DELAY (24C2T)						OK?
						RAN
<b>Relay Test Results for:</b> 24D2D2 V/HZ DELAY (24C2T)						OK?
						RAN
<b>Relay Test Results for:</b> 24IP (I) V/HZ PICKUP (24C2)						OK?
						RAN
<b>Relay Test Results for:</b> 24IP (I) V/HZ CURVE (24C2T)						OK?
						RAN
<b>Relay Test Results for:</b> 24IP (ID) V/HZ PICKUP (24C2)						OK?
	PICKUP	VOLTS	IDEAL	%ERROR		PASS
	126.000		126.000	0.00		
<b>Relay Test Results for:</b> 24IP (ID) V/HZ CURVE (24C2T)						OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		PASS
1.10	138.600	576.90	9.615	9.475 TO 10.525		
1.20	151.200	149.55	2.493	2.350 TO 2.650		
1.30	163.800	68.11	1.135	1.031 TO 1.192		
1.50	189.000	26.47	0.441	0.355 TO 0.445		
<b>Relay Test Results for:</b> 27P1P UV PICKUP (27P1)						OK?
	PICKUP	VOLTS	IDEAL	%ERROR		PASS
	53.460		54.000	-1.00		

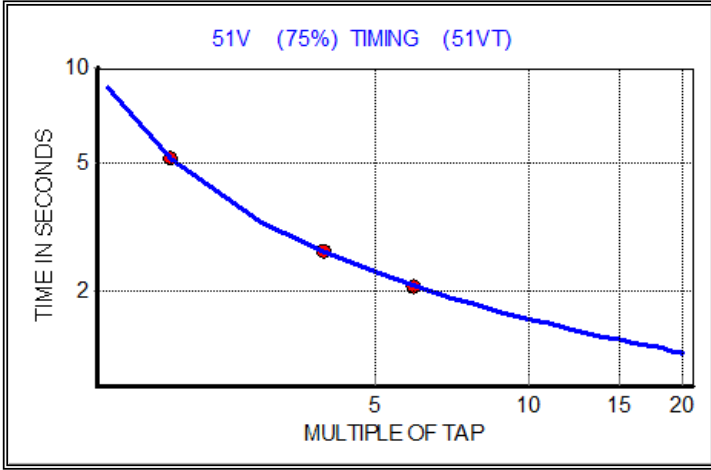
<b>Relay Test Results for:</b> 27P2P UV PICKUP (27P2)						OK? RAN
<b>Relay Test Results for:</b> 27V1P UV PICKUP (27V1)						OK? RAN
<b>Relay Test Results for:</b> 27PP1 UV PICKUP (27PP1)						OK? PASS
	PICKUP	VOLTS	IDEAL	%ERROR		
		53.982	53.982	-0.00		
<b>Relay Test Results for:</b> 27PP2 UV PICKUP (27PP2)						OK? PASS
	PICKUP	VOLTS	IDEAL	%ERROR		
		53.982	53.982	-0.00		
<b>Relay Test Results for:</b> 32P1P PWR PICKUP (32P1)						OK? PASS
PHASE	PICKUP	CURRENT	IDEAL	%ERROR		
3PH		0.145	0.145	0.34		
<b>Relay Test Results for:</b> 32P1D PWR DELAY (32P1T)						OK? PASS
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		
1.20	0.174	1201.94	20.032	18.975 TO 21.025		
<b>Relay Test Results for:</b> 32P2P PWR PICKUP (32P2)						OK? PASS
PHASE	PICKUP	CURRENT	IDEAL	%ERROR		
3PH		0.290	0.290	0.00		
<b>Relay Test Results for:</b> 32P2D PWR DELAY (32P2T)						OK? PASS
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		
1.20	0.348	301.91	5.032	4.725 TO 5.275		
<b>Relay Test Results for:</b> 46Q1P NEG PICKUP (46Q1)						OK? PASS
	PICKUP	CURRENT	IDEAL	%ERROR		
		0.696	0.696	-0.04		
<b>Relay Test Results for:</b> 46Q1D NEG DELAY (46Q1T)						OK? PASS
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		
1.20	0.835	1802.87	30.048	28.450 TO 31.550		
<b>Relay Test Results for:</b> 46Q2P NEG PICKUP (46Q2)						OK? PASS
	PICKUP	CURRENT	IDEAL	%ERROR		
		0.703	0.696	0.96		
<b>Relay Test Results for:</b> 46Q2D 100% INOM (46Q2T)						OK? PASS
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE		
	8.700	602.89	10.048	9.450 TO 10.550		
<b>Relay Test Results for:</b> 46Q2D 50% INOM (46Q2T)						OK? PASS
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE		
	4.350	2409.61	40.160	37.950 TO 42.050		
<b>Relay Test Results for:</b> 50P1P OC PICKUP (50P1)						OK? PASS
PHASE	PICKUP	CURRENT	IDEAL	%ERROR		
A-N		37.500	37.500	0.00		
B-N		37.500	37.500	0.00		
C-N		37.500	37.500	0.00		

<b>Relay Test Results for:</b> 50P1D OC DELAY (50P1T)						
50P1D OC DELAY	(50P1T)	(PHASE A-N)				
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	45.000	1.33	0.022	0.000 TO 0.025		PASS
50P1D OC DELAY (50P1T) (PHASE B-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	45.000	1.33	0.022	0.000 TO 0.025		PASS
50P1D OC DELAY (50P1T) (PHASE C-N)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	45.000	1.33	0.022	0.000 TO 0.025		PASS
<b>Relay Test Results for:</b> 50P2P OC PICKUP (50P2)						
						OK?
						RAN
<b>Relay Test Results for:</b> 50P2D OC DELAY (50P2T)						
						OK?
						RAN
<b>Relay Test Results for:</b> 50G1P OC PICKUP (50G1)						
	PICKUP	CURRENT	IDEAL	%ERROR		OK?
		3.000	3.000	-0.00		PASS
<b>Relay Test Results for:</b> 50G1D OC DELAY (50G1T)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	RANGE		OK?
1.20	3.600	1.43	0.024	0.000 TO 0.025		PASS
<b>Relay Test Results for:</b> 50G2P OC PICKUP (50G2)						
						OK?
						RAN
<b>Relay Test Results for:</b> 50G2D OC DELAY (50G2T)						
						OK?
						RAN
<b>Relay Test Results for:</b> 51GP OC PICKUP (51G)						
						OK?
						RAN
<b>Relay Test Results for:</b> 51G OC TIMING (51GT)						
						OK?
						RAN
<b>Relay Test Results for:</b> 51CP OC PICKUP (51C)						
						OK?
						RAN
<b>Relay Test Results for:</b> 51C OC TIMING (51CT)						
						OK?
						RAN
<b>Relay Test Results for:</b> 51VP (100%) PICKUP (51V)						
	PICKUP	CURRENT	IDEAL	%ERROR		OK?
		4.349	4.350	-0.01		PASS
<b>Relay Test Results for:</b> 51VP (75%) PICKUP (51V)						
	PICKUP	CURRENT	IDEAL	%ERROR		OK?
		3.262	3.263	-0.00		PASS

<b>Relay Test Results for:</b> 51V (100%) TIMING (51VT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	8.700	308.12	5.135	5.143	-0.15	PASS	
3.00	13.050	197.02	3.284	3.288	-0.13	PASS	
4.00	17.400	157.69	2.628	2.630	-0.07	PASS	



<b>Relay Test Results for:</b> 51V (75%) TIMING (51VT)							
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?	
2.00	6.525	308.76	5.146	5.143	0.06	PASS	
4.00	13.050	157.63	2.627	2.630	-0.10	PASS	
6.00	19.575	123.37	2.056	2.061	-0.24	PASS	



<b>Relay Test Results for:</b> 59P1P OV PICKUP (59P1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59P2P OV PICKUP (59P2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		

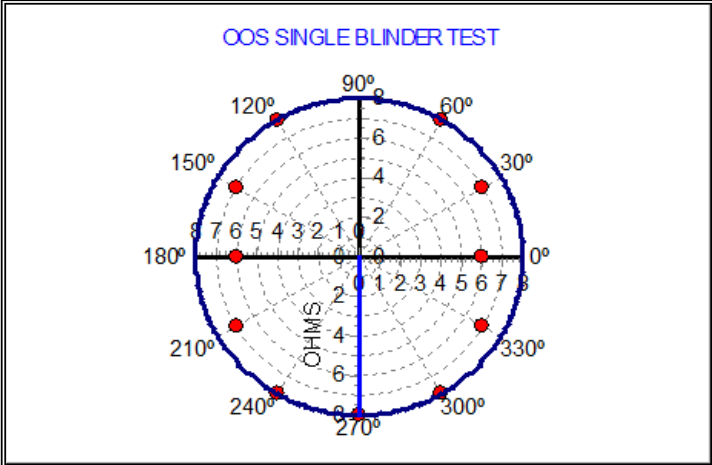
<b>Relay Test Results for:</b> 59G1P OV PICKUP (59G1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	-0.00	PASS			

<b>Relay Test Results for:</b> 59G2P OV PICKUP (59G2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
				RAN		



<b>Relay Test Results for:</b>	59Q1P OV PICKUP	(59Q)								OK? RAN
<b>Relay Test Results for:</b>	59V1P OV PICKUP	(59V1)								OK? RAN
<b>Relay Test Results for:</b>	59PP1 OV PICKUP	(59PP1)								OK? RAN
<b>Relay Test Results for:</b>	59PP2 OV PICKUP	(59PP2)								OK? RAN
<b>Relay Test Results for:</b>	27B81P FREQ INHIBIT	(27B81)								
	PICKUP VOLTS	IDEAL	%ERROR							OK? PASS
	20.000	20.000	0.00							
<b>Relay Test Results for:</b>	81D1P FREQ PICKUP	(81D1)								
	PICKUP HZ	IDEAL	RANGE							OK? PASS
	59.090	59.100	59.050 TO 59.150							
<b>Relay Test Results for:</b>	81D1D FREQ DELAY	(81D1T)								
	APPLIED VALUE	TIME(CY)	TIME(SEC)	RANGE						OK? PASS
	58.900	4.45	0.075	0.000 TO 0.093						
<b>Relay Test Results for:</b>	81D2P FREQ PICKUP	(81D2)								OK? RAN
<b>Relay Test Results for:</b>	81D2D FREQ DELAY	(81D2T)								OK? RAN
<b>Relay Test Results for:</b>	81D3P FREQ PICKUP	(81D3)								OK? RAN
<b>Relay Test Results for:</b>	81D3D FREQ DELAY	(81D3T)								OK? RAN
<b>Relay Test Results for:</b>	81D4P FREQ PICKUP	(81D4)								OK? RAN
<b>Relay Test Results for:</b>	81D4D FREQ DELAY	(81D4T)								OK? RAN
<b>Relay Test Results for:</b>	81D5P FREQ PICKUP	(81D5)								OK? RAN
<b>Relay Test Results for:</b>	81D5D FREQ DELAY	(81D5T)								OK? RAN
<b>Relay Test Results for:</b>	81D6P FREQ PICKUP	(81D6)								OK? RAN
<b>Relay Test Results for:</b>	81D6D FREQ DELAY	(81D6T)								OK? RAN

<b>Relay Test Results for:</b>		OOS SINGLE BLINDER TEST					
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?	
270.00	27.706	2.000	7.998	8.000	-0.02	PASS	
300.00	27.706	2.000	7.998	8.000	-0.02	PASS	
330.00	27.706	2.308	6.929	6.928	0.02	PASS	
360.00	27.706	2.680	5.970	6.000	-0.51	PASS	
30.00	27.706	2.308	6.929	6.928	0.02	PASS	
60.00	27.706	2.000	7.998	8.000	-0.02	PASS	
240.00	27.706	2.000	7.998	8.000	-0.02	PASS	
210.00	27.706	2.308	6.929	6.928	0.02	PASS	
180.00	27.706	2.666	5.999	6.000	-0.01	PASS	
150.00	27.706	2.308	6.929	6.928	0.02	PASS	
120.00	27.706	2.000	7.998	8.000	-0.02	PASS	



<b>Relay Test Results for:</b>	OOS TWO BLINDER INNER TEST	OK? RAN
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<b>Relay Test Results for:</b>	OOS TWO BLINDER OUTER TEST	OK? RAN
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<b>Relay Test Results for:</b>	OOS TIMING (OOST)	OK? RAN
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<b>Relay Test Results for:</b>	50N1P NEUT PICKUP (50N1)	OK? RAN
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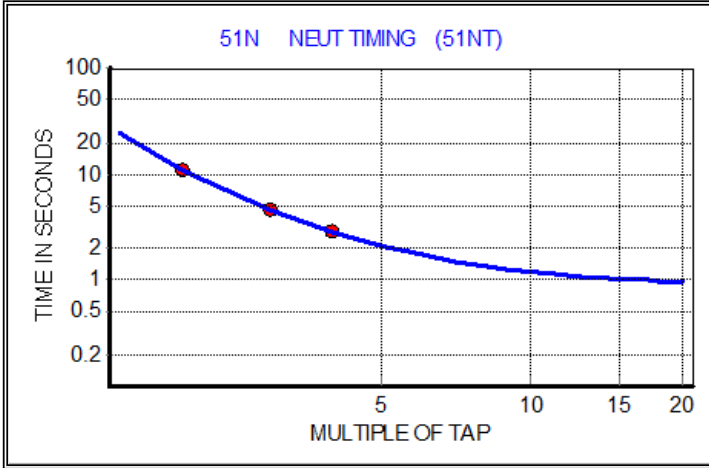
<b>Relay Test Results for:</b>	50N1D NEUT DELAY (50N1T)	OK? RAN
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<b>Relay Test Results for:</b>	50N2P NEUT PICKUP (50N2)	OK? RAN
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<b>Relay Test Results for:</b>	50N2D NEUT DELAY (50N2T)	OK? RAN
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<b>Relay Test Results for:</b>	51NP NEUT PICKUP (51N)	OK? PASS
	PICKUP CURRENT IDEAL %ERROR	
	1.000 1.000 0.00	

<b>Relay Test Results for:</b> 51N NEUT TIMING (51NT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	2.000	646.82	10.780	10.817	-0.34	PASS
3.00	3.000	276.17	4.603	4.619	-0.35	PASS
4.00	4.000	172.97	2.883	2.883	-0.01	PASS



<b>Relay Test Results for:</b> 50H1P OC PICKUP (50H1)	OK? RAN
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<b>Relay Test Results for:</b> 50H1D OC DELAY (50H1T)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PA OC PICKUP (50H2A)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PB OC PICKUP (50H2B)	OK? RAN
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<b>Relay Test Results for:</b> 50H2PC OC PICKUP (50H2C)	OK? RAN
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<b>Relay Test Results for:</b> 50H2D OC DELAY (50H2T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1P OC PICKUP (50Q1)	OK? RAN
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<b>Relay Test Results for:</b> 50Q1D OC DELAY (50Q1T)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2P OC PICKUP (50Q2)	OK? RAN
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<b>Relay Test Results for:</b> 50Q2D OC DELAY (50Q2T)	OK? RAN
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<b>Relay Test Results for:</b> 50R1P OC PICKUP (50R1)	OK? RAN
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<b>Relay Test Results for:</b>	50R1D	OC DELAY	(50R1T)	OK? RAN
<b>Relay Test Results for:</b>	50R2P	OC PICKUP	(50R2)	OK? RAN
<b>Relay Test Results for:</b>	50R2D	OC DELAY	(50R2T)	OK? RAN
<b>Relay Test Results for:</b>	U87P	APH PICKUP	(87U1)	OK? RAN
<b>Relay Test Results for:</b>	U87P	87A PICKUP	(87U1)	OK? RAN
<b>Relay Test Results for:</b>	O87P	APH PICKUP	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	O87P	87A PICKUP	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	SLP1	APH DIFF TEST	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	SLP2	APH DIFF TEST	(87R1)	OK? RAN
<b>Relay Test Results for:</b>	U87P	BPH PICKUP	(87U2)	OK? RAN
<b>Relay Test Results for:</b>	U87P	87B PICKUP	(87U2)	OK? RAN
<b>Relay Test Results for:</b>	O87P	BPH PICKUP	(87R2)	OK? RAN
<b>Relay Test Results for:</b>	O87P	87B PICKUP	(87R2)	OK? RAN
<b>Relay Test Results for:</b>	SLP1	BPH DIFF TEST	(87R2)	OK? RAN
<b>Relay Test Results for:</b>	SLP2	BPH DIFF TEST	(87R2)	OK? RAN
<b>Relay Test Results for:</b>	U87P	CPH PICKUP	(87U3)	OK? RAN
<b>Relay Test Results for:</b>	U87P	87C PICKUP	(87U3)	OK? RAN

Relay Results (continued) for: SEL-300G.FST1877812112013AL

<b><u>Relay Test Results for:</u></b> O87P CPH PICKUP (87R3)	OK? RAN
<b><u>Relay Test Results for:</u></b> O87P 87C PICKUP (87R3)	OK? RAN
<b><u>Relay Test Results for:</u></b> SLP1 CPH DIFF TEST (87R3)	OK? RAN
<b><u>Relay Test Results for:</u></b> SLP2 CPH DIFF TEST (87R3)	OK? RAN
<b><u>Relay Test Results for:</u></b> RESTORE LOGIC SETTINGS	OK? RAN
<b><u>Relay Test Results for:</u></b> RESTORE PORT SETTINGS	OK? RAN
<b><u>Relay Test Results for:</u></b> COMPARE AF TO AL SETTINGS	OK? RAN
<b><u>Relay Test Results for:</u></b> LOG OUT OF RELAY	OK? RAN

# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-351A.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 01/19/2014		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: North Feeder Breaker Terminal:		VA Gainesville, Fla	
Phase_Zone: 3 Phase Relay	Relay_Manf: SEL		
Relay_Type: SEL-351A	Model_Style: SEL-351A.FST2104301192014AL		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325243	Firmware: NA		
Relay_ID: 0	NERC_Auditabile: 0		
NERC_SubNum: 0	Maint_Interval: 0		
Previous_TestDate: 12/19/2010	Current_TestDate: 12/19/2014		
Next_TestDate: 12/19/2016	TestSet_CalDate: 11/18/2013		
Approved_By:			
<b><u>Global Defines:</u></b>			
SET_GROUP\$="1" 'SET GROUP TO TEST			
CONTACT\$="107" 'OUTPUT CONTACT TO MASK			
SEL_AUTO=1 '0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES			
SKIP_TST=1 'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED			
NO_TOE=1 'NO ERROR MESSAGE IF NO OPERATION			
PRINT_RAN_TESTS=0 'PRINT RESULTS FOR ALL TESTS ATTEMPTED			
DIR_TEST_VOLTS=30 'TEST VOLTAGE FOR DIRECTIONAL ELEMENTS			
NORM_VOLTS=67 'NORM VOLTAGE			
NORM_FREQ=60 'NORMAL VOLTAGE FREQUENCY			
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$=	"GENERATOR MAIN"	TID\$=	"TEST SETTING"CTR= 240
CTRN=	240	PTR=	103.90 PTRS= 103.90
VNOM=	69.30	Z1MAG=	2.14 Z1ANG= 68.86
Z0MAG=	6.38	Z0ANG=	72.47 LL= 4.84
E50P=	1	E50N\$=	"N" E50G\$= "N"
E50Q\$=	"N"	E51P=	1 E51N\$= "Y"
E51G\$=	"N"	E51Q\$=	"N" E32\$= "AUTO"
ELOAD\$=	"N"	ESOTF\$=	"N" EVOLT\$= "Y"
E25\$=	"Y"	EFLOC\$=	"N" ELOP\$= "N"
E81\$=	"N"	E79\$=	"N" ESV= 10
EDEM\$=	"THM"	s50P1P=	20.00 s67P1D= 0.00
s50PP1P\$=	"OFF"	s51PP=	2.25 s51PC\$= "U2"
s51PTD=	0.50	s51PRS\$=	"N" s51NP= 1.750
s51NC\$=	"U2"	s51NTD=	0.85 s51NRS\$= "N"
DIR1\$=	"N"	DIR2\$=	"N" DIR3\$= "N"
DIR4\$=	"N"	ORDER\$=	"OFF" s50P32P= 3.00
Z2F=	1.06	Z2R=	1.26 s50QFP= 0.50
s50QRP=	0.25	A2=	0.10 K2= 0.20
s27P1P=	62.00	s27P2P=	55.00 s59P1P= 130.00
s59P2P=	135.00	s59N1P\$=	"OFF" s59N2P\$= "OFF"
s59QP\$=	"OFF"	s59V1P\$=	"OFF" s27SP= 10.00

Relay Results (continued) for: SEL-351A.FST2104301192014AL

s59S1P\$=	"OFF"	s59S2P\$=	"OFF"	s27PP=	55.00
s59PP=	135.00	s25VLO=	62.00	s25VHI=	76.00
s25SF=	0.042	s25ANG1=	15	s25ANG2=	15
SYNCP\$=	"VC"	TCLOSD=	3.00	DMTC=	5
PDEMP=	5.00	NDEMP=	1.500	GDEMP=	1.50
QDEMP=	1.50	TDURD=	9.00	CFD=	60.00
s3POD=	1.50	s50LP=	0.25	SV1PU=	12.00
SV1DO=	2.00	SV2PU=	0.00	SV2DO=	0.00
SV3PU=	120.00	SV3DO=	0.00	SV4PU=	30.00
SV4DO=	0.00	SV5PU=	0.00	SV5DO=	0.00
SV6PU=	0.00	SV6DO=	0.00	SV7PU=	0.00
SV7DO=	0.00	SV8PU=	0.00	SV8DO=	0.00
SV9PU=	0.00	SV9DO=	0.00	SV10PU=	0.00
SV10DO=	0.00	TR\$=	"SV1T + 51PT + 50P1 + 51NT"	TRSOTF=	0
DTT=	0	ULTR\$=	"!(SV1T + 51PT + 50P1 + 51NT)"	s52A\$=	"IN101"
CL\$=	"CC + LB4"	ULCL\$=	"TRIP"	s79RI\$=	"TRIP"
s79RIS\$=	"52A + 79CY"	s79DTL\$=	"OC + !IN102 + LB3"	s79DLS\$=	"79LO"
s79SKP=	0	s79STL\$=	"TRIP"	s79BRS=	0
s79SEQ=	0	s79CLS=	1	SET1=	0
RST1=	0	SET2=	0	RST2=	0
SET3=	0	RST3=	0	SET4=	0
RST4=	0	SET5=	0	RST5=	0
SET6=	0	RST6=	0	SET7=	0
RST7=	0	SET8=	0	RST8=	0
SET9=	0	RST9=	0	SET10=	0
RST10=	0	SET11=	0	RST11=	0
SET12=	0	RST12=	0	SET13=	0
RST13=	0	SET14=	0	RST14=	0
SET15=	0	RST15=	0	SET16=	0
RST16=	0	s67P1TC=	1	s67P2TC=	1
s67P3TC=	1	s67P4TC=	1	s67N1TC=	1
s67N2TC=	1	s67N3TC=	1	s67N4TC=	1
s67G1TC=	1	s67G2TC=	1	s67G3TC=	1
s67G4TC=	1	s67Q1TC=	1	s67Q2TC=	1
s67Q3TC=	1	s67Q4TC=	1	s51ATC=	1
s51BTC=	1	s51CTC=	1	s51PTC=	1
s51NTC=	1	s51GTC=	1	s51QTC=	1
SV1\$=	"50A1 + 50B1 + 50C1"	SV2=	0	SV3\$=	"27A1 + 27B1 + 27C1"
SV4=	0	SV5\$=	"25A1 + !SV3 * 27S"	SV6=	0
SV7=	0	SV8=	0	SV9=	0
SV10=	0	SV11=	0	SV12=	0
SV13=	0	SV14=	0	SV15=	0
SV16=	0	OUT101\$=	"TRIP"	OUT102=	0
OUT103=	0	OUT104\$=	"SV5T * !IN101"	OUT105=	0
OUT106\$=	"SV5"	OUT107\$=	"SV5"	DP1\$=	"IN101"
DP2=	0	DP3=	0	DP4=	0
DP5=	0	DP6=	0	DP7=	0
DP8=	0	DP9=	0	DP10=	0
DP11=	0	DP12=	0	DP13=	0
DP14=	0	DP15=	0	DP16=	0

```

SS1=      1          SS2=      0          SS3=      0
SS4=      0          SS5=      0          SS6=      0
ER$=      "/51P + /51G"  FAULT$=   "51P + 51G"  BSYNCH$=  "52A"
CLMON=    0          BKMON$=   "TRIP"       E32IV=    1
PTCONN$=  "WYE"      VSCONN$=  "VS"          TGR=      0.00
NFREQ=    60         PHROT$=   "ABC"       DATE_F$=  "MDY"
FP_TO=    15         SCROLD=   2          FPNGD$=   "IN"
LER=      15         PRE=      4          DCLOP$=   "OFF"
DCHIP$=   "OFF"     IN101D=   0.50       IN102D=   0.50
IN103D=   0.50     IN104D=   0.50       IN105D=   0.50
IN106D=   0.50     EBMON$=   "Y"          COSP1=    10000
COSP2=    150       COSP3=    12         KASP1=    1.20
KASP2=    8.00     KASP3=    20.00     EPMU$=    "N"
P1_PROTO$= "SEL"    P1_SPEED=  2400     P1_BITS=  8
P1_PARITY$= "N"     P1_STOP=   1       P1_T_OUT= 15
P1_AUTO$=  "N"     P1_FASTOP$= "N"    P2_PROTO$= "SEL"
P2_SPEED=  2400     P2_BITS=  8       P2_PARITY$= "N"
P2_STOP=   1       P2_T_OUT=  0       P2_AUTO$=  "N"
P2_RTSTCT$= "N"    P2_FASTOP$= "N"    P3_PROTO$= "SEL"
P3_SPEED=  2400     P3_BITS=  8       P3_PARITY$= "N"
P3_STOP=   1       P3_T_OUT= 15       P3_AUTO$=  "N"
P3_RTSTCT$= "N"    P3_FASTOP$= "N"    PF_PROTO$= "SEL"
PF_SPEED=  2400     PF_BITS=  8       PF_PARITY$= "N"
PF_STOP=   1       PF_T_OUT= 15       PF_AUTO$=  "N"
PF_RTSTCT$= "N"    PF_FASTOP$= "N"
  
```

**Relay Test Results for:** RELAY STATUS CHECK

N/A

Additional Data:  
STA

GENERATOR MAIN Date: 01/19/14 Time: 11:55:01.464  
TEST SETTING

FID=SEL-351A-R401-V0-Z008006-D20070725 CID=90F4

**SELF TESTS**

W=Warn F=Fail

OS	IA	IB	IC	IN	VA	VB	VC	VS	MOF
	2	1	1	1	-1	2	1	0	2
PS	+5V_PS	+5V_REG	-5V_REG	+12V_PS	-12V_PS	+15V_PS	-15V_PS		
	5.03	5.05	-4.94	11.99	-11.95	15.02	-15.19		
	TEMP	RAM	ROM	A/D	CR_RAM	EEPROM	IO_BRD		
	32.6	OK	OK	OK	OK	OK	OK		

Relay Enabled

=>>

**Relay Test Results for:** 51PP PH PICKUP (51P)

PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?
A-N		2.251	2.250	0.02	PASS
B-N		2.273	2.250	1.02	PASS
C-N		2.228	2.250	-0.98	PASS

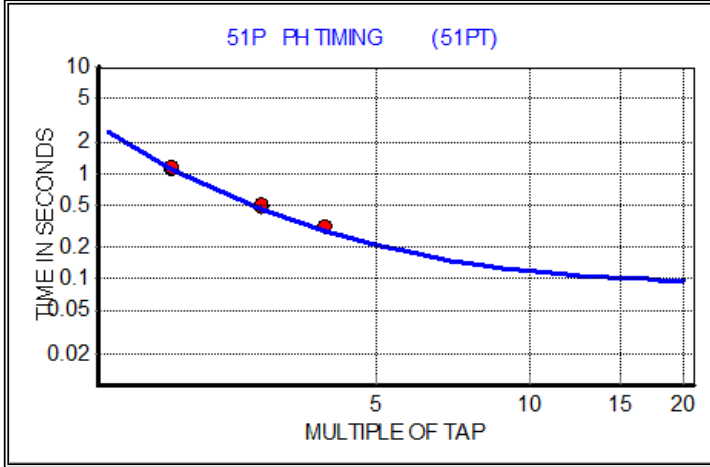


**Relay Test Results for:** 51P PH TIMING (51PT)

51P PH TIMING (51PT) (PHASE A-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	65.65	1.094	1.013	1.150	PASS
3.00	6.750	29.09	0.485	0.418	0.505	PASS
4.00	9.000	18.64	0.311	0.252	0.325	PASS

51P PH TIMING (51PT) (PHASE B-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	66.19	1.103	1.013	1.150	PASS
3.00	6.750	28.99	0.483	0.418	0.505	PASS
4.00	9.000	18.83	0.314	0.252	0.325	PASS

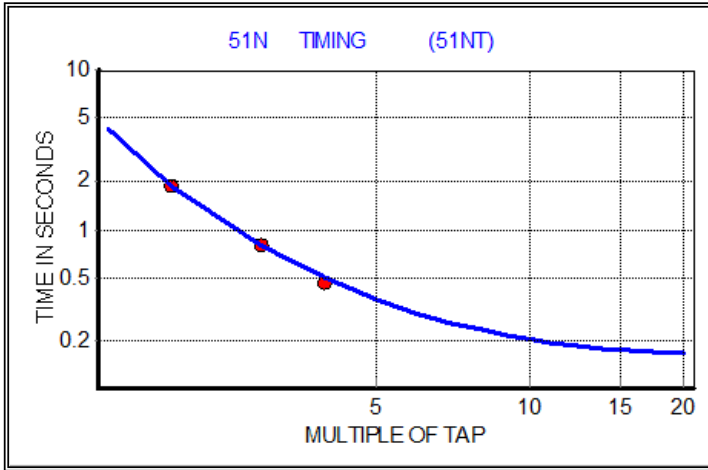
51P PH TIMING (51PT) (PHASE C-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	66.09	1.101	1.013	1.150	PASS
3.00	6.750	29.37	0.489	0.418	0.505	PASS
4.00	9.000	18.37	0.306	0.252	0.325	PASS



**Relay Test Results for:** 51NP PICKUP (51N)

PICKUP CURRENT	IDEAL	%ERROR	OK?
1.786	1.750	2.03	PASS

<b>Relay Test Results for:</b>		51N	TIMING	(51NT)			
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		RANGE		OK?
2.00	3.500	110.97	1.849	1.740	TO	1.937	PASS
3.00	5.250	46.92	0.782	0.729	TO	0.842	PASS
4.00	7.000	27.68	0.461	0.446	TO	0.535	PASS



# RTS Relay Test Results

Powered by:



<b>Lib Routine:</b> SEL-351A.FST_LIB	<b>AF/AL:</b> AL	<b>Pass/Fail:</b> PASS	
<b>Lib Version:</b>	<b>Test Date:</b> 02/02/2014		
<b><u>Relay Data:</u></b>			
Tested_By: Troy Buffington NETA Cert. #90-3-5392			
Division: Full Power Backup Generator Bldg.			
Substation: South Feeder Board	Terminal: VA Gainesville, Fla		
Phase_Zone: 3 Phase Relay	Relay_Manf: SEL		
Relay_Type: SEL-351A	Model_Style: 0351A00523554XX		
IEEE_Device: MF	IL_IB: 0		
Serial_Number: 2007325244	Firmware: NA		
Relay_ID: Main South Board	FeederNERC_Auditabile: 0		
NERC_SubNum: 0	Maint_Interval: 60 Months		
Previous_TestDate: 6/12/2009	Current_TestDate: 2/2/2014		
Next_TestDate: 2/2/2019	TestSet_CalDate: 11/19/2012		
Approved_By: N/A			
<b><u>Global Defines:</u></b>			
SET_GROUP\$="1"	'SET GROUP TO TEST		
CONTACT\$="102"	'OUTPUT CONTACT TO MASK		
SEL_AUTO=1	'0=MANUAL, 1=AUTO MASK, 2=MANUAL W/MESSAGES		
SKIP_TST=1	'DEFEAT DISPLAYED MESSAGES FOR ALL TESTS SKIPPED		
NO_TOE=1	'NO ERROR MESSAGE IF NO OPERATION		
PRINT_RAN_TESTS=0	'PRINT RESULTS FOR ALL TESTS ATTEMPTED		
DIR_TEST_VOLTS=30	'TEST VOLTAGE FOR DIRECTIONAL ELEMENTS		
NORM_VOLTS=67	'NORM VOLTAGE		
NORM_FREQ=60	'NORMAL VOLTAGE FREQUENCY		
<b><u>Routine Notes:</u></b>			
<b><u>Relay Settings Used for Testing:</u></b>			
RID\$= "GENERATOR MAIN"	TID\$= "TEST SETTING"	CTR= 240	
CTRN= 240	PTR= 103.90	PTRS= 103.90	
VNOM= 69.30	Z1MAG= 2.14	Z1ANG= 68.86	
Z0MAG= 6.38	Z0ANG= 72.47	LL= 4.84	
E50P= 1	E50N\$= "N"	E50G\$= "N"	
E50Q\$= "N"	E51P= 1	E51N\$= "Y"	
E51G\$= "N"	E51Q\$= "N"	E32\$= "AUTO"	
ELOAD\$= "N"	ESOTF\$= "N"	EVOLT\$= "Y"	
E25\$= "Y"	EFLOC\$= "N"	ELOP\$= "N"	
E81\$= "N"	E79\$= "N"	ESV= 10	
EDEM\$= "THM"	s50P1P= 20.00	s67P1D= 0.00	
s50PP1P\$= "OFF"	s51PP= 2.25	s51PC\$= "U2"	
s51PTD= 0.50	s51PRS\$= "N"	s51NP= 1.750	
s51NC\$= "U2"	s51NTD= 0.85	s51NRS\$= "N"	
DIR1\$= "N"	DIR2\$= "N"	DIR3\$= "N"	
DIR4\$= "N"	ORDER\$= "OFF"	s50P32P= 3.00	
Z2F= 1.06	Z2R= 1.26	s50QFP= 0.50	
s50QRP= 0.25	A2= 0.10	K2= 0.20	
s27P1P= 62.00	s27P2P= 55.00	s59P1P= 130.00	
s59P2P= 135.00	s59N1P\$= "OFF"	s59N2P\$= "OFF"	

Relay Results (continued) for: SEL-351A.FST1794002022014AL

s59QP\$=	"OFF"	s59V1P\$=	"OFF"	s27SP=	10.00
s59S1P\$=	"OFF"	s59S2P\$=	"OFF"	s27PP=	55.00
s59PP=	135.00	s25VLO=	62.00	s25VHI=	76.00
s25SF=	0.042	s25ANG1=	15	s25ANG2=	15
SYNCP\$=	"VC"	TCLOSD=	3.00	DMTC=	5
PDEMP=	5.00	NDEMP=	1.500	GDEMP=	1.50
QDEMP=	1.50	TDURD=	9.00	CFD=	60.00
s3POD=	1.50	s50LP=	0.25	SV1PU=	12.00
SV1DO=	2.00	SV2PU=	0.00	SV2DO=	0.00
SV3PU=	120.00	SV3DO=	0.00	SV4PU=	30.00
SV4DO=	0.00	SV5PU=	0.00	SV5DO=	0.00
SV6PU=	0.00	SV6DO=	0.00	SV7PU=	0.00
SV7DO=	0.00	SV8PU=	0.00	SV8DO=	0.00
SV9PU=	0.00	SV9DO=	0.00	SV10PU=	0.00
SV10DO=	0.00	TR\$=	"SV1T + 51PT + 50P1 + 51NT"	TRSOTF=	0
DTT=	0	ULTR\$=	"!(SV1T + 51PT + 50P1 + 51NT)"	s52A\$=	"IN101"
CL\$=	"CC + LB4"	ULCL\$=	"TRIP"	s79RI\$=	"TRIP"
s79RIS\$=	"52A + 79CY"	s79DTL\$=	"OC + !IN102 + LB3"	s79DLS\$=	"79LO"
s79SKP=	0	s79STL\$=	"TRIP"	s79BRS=	0
s79SEQ=	0	s79CLS=	1	SET1=	0
RST1=	0	SET2=	0	RST2=	0
SET3=	0	RST3=	0	SET4=	0
RST4=	0	SET5=	0	RST5=	0
SET6=	0	RST6=	0	SET7=	0
RST7=	0	SET8=	0	RST8=	0
SET9=	0	RST9=	0	SET10=	0
RST10=	0	SET11=	0	RST11=	0
SET12=	0	RST12=	0	SET13=	0
RST13=	0	SET14=	0	RST14=	0
SET15=	0	RST15=	0	SET16=	0
RST16=	0	s67P1TC=	1	s67P2TC=	1
s67P3TC=	1	s67P4TC=	1	s67N1TC=	1
s67N2TC=	1	s67N3TC=	1	s67N4TC=	1
s67G1TC=	1	s67G2TC=	1	s67G3TC=	1
s67G4TC=	1	s67Q1TC=	1	s67Q2TC=	1
s67Q3TC=	1	s67Q4TC=	1	s51ATC=	1
s51BTC=	1	s51CTC=	1	s51PTC=	1
s51NTC=	1	s51GTC=	1	s51QTC=	1
SV1\$=	"50A1 + 50B1 + 50C1"	SV2=	0	SV3\$=	"27A1 + 27B1 + 27C1"
SV4=	0	SV5\$=	"25A1 + !SV3 * 27S"	SV6=	0
SV7=	0	SV8=	0	SV9=	0
SV10=	0	SV11=	0	SV12=	0
SV13=	0	SV14=	0	SV15=	0
SV16=	0	OUT101\$=	"TRIP"	OUT102=	0
OUT103=	0	OUT104\$=	"SV5T * !IN101"	OUT105=	0
OUT106\$=	"SV5"	OUT107\$=	"SV5"	DP1\$=	"IN101"
DP2=	0	DP3=	0	DP4=	0
DP5=	0	DP6=	0	DP7=	0
DP8=	0	DP9=	0	DP10=	0
DP11=	0	DP12=	0	DP13=	0



<b>Relay Test Results for:</b> METER TEST							
	APPLIED SEC VOLT	APPLIED SEC AMP	CURRENT PH LAG				
	67.00	2.00	30.00				
PHASE	CALCULATED PRI KV	MEASURED PRI KV	% ERROR	CALCULATED PRI CUR	MEASURED PRI CUR	% ERROR	OK?
A-N	6.8	6.8	0.0	432.0	432.3	0.1	PASS
B-N	7.0	7.0	0.1	480.0	480.6	0.1	PASS
C-N	7.2	7.2	-0.0	528.0	528.4	0.1	PASS
	CALCULATED MEGA WATT	MEASURED MEGA WATT	% ERROR	CALCULATED MEGA VAR	MEASURED MEGA VAR	% ERROR	OK?
	8.7	8.7	0.2	5.0	5.0	-0.2	PASS

<b>Relay Test Results for:</b> 50P1P PICKUP (50P1)						
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
A-N		20.000	20.000	-0.00	PASS	
B-N		20.000	20.000	-0.00	PASS	
C-N		20.000	20.000	-0.00	PASS	

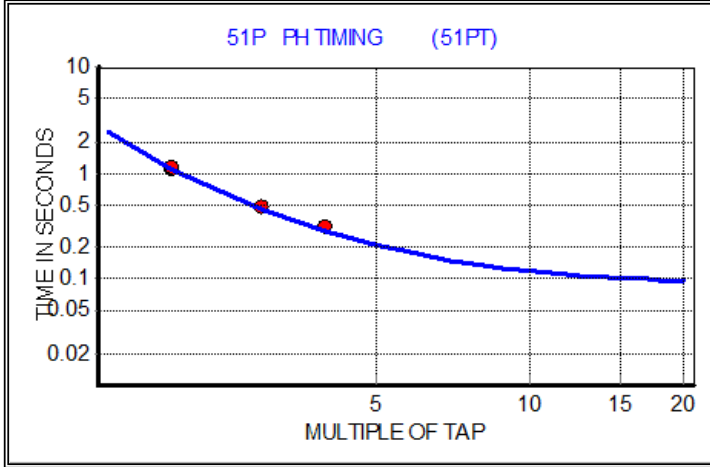
<b>Relay Test Results for:</b> 51PP PH PICKUP (51P)						
PHASE	PICKUP	CURRENT	IDEAL	%ERROR	OK?	
A-N		2.251	2.250	0.02	PASS	
B-N		2.251	2.250	0.02	PASS	
C-N		2.251	2.250	0.02	PASS	

**Relay Test Results for:** 51P PH TIMING (51PT)

51P PH TIMING (51PT) (PHASE A-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	65.39	1.090	1.013	1.150	PASS
3.00	6.750	28.80	0.480	0.418	0.505	PASS
4.00	9.000	18.50	0.308	0.252	0.325	PASS

51P PH TIMING (51PT) (PHASE B-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	66.04	1.101	1.013	1.150	PASS
3.00	6.750	28.87	0.481	0.418	0.505	PASS
4.00	9.000	18.54	0.309	0.252	0.325	PASS

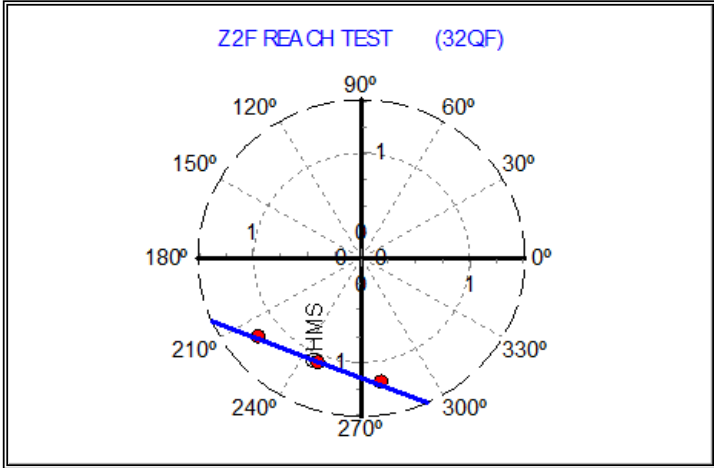
51P PH TIMING (51PT) (PHASE C-N)				RANGE		OK?
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)		TO	
2.00	4.500	65.92	1.099	1.013	1.150	PASS
3.00	6.750	28.80	0.480	0.418	0.505	PASS
4.00	9.000	18.31	0.305	0.252	0.325	PASS



**Relay Test Results for:** 50QFP PICKUP (32QF)

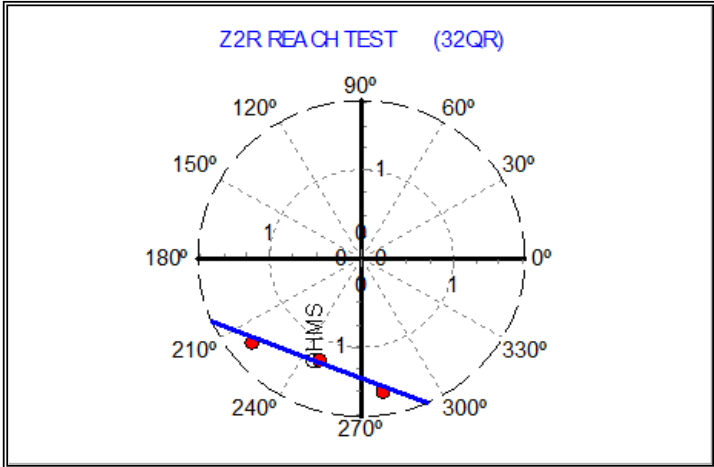
PICKUP	CURRENT	IDEAL	RANGE	OK?
	0.495	0.500	0.450 TO 0.550	PASS

<b>Relay Test Results for:</b>		Z2F REACH TEST	(32QF)			
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
248.86	5.000	4.670	1.071	1.060	1.01	PASS
278.86	5.000	4.167	1.200	1.224	-1.97	PASS
218.86	5.000	4.167	1.200	1.224	-1.97	PASS



<b>Relay Test Results for:</b>		50QRP PICKUP	(32QR)			
PICKUP	CURRENT	IDEAL	RANGE	TO	OK?	
	0.245	0.250	0.225 TO 0.275		PASS	

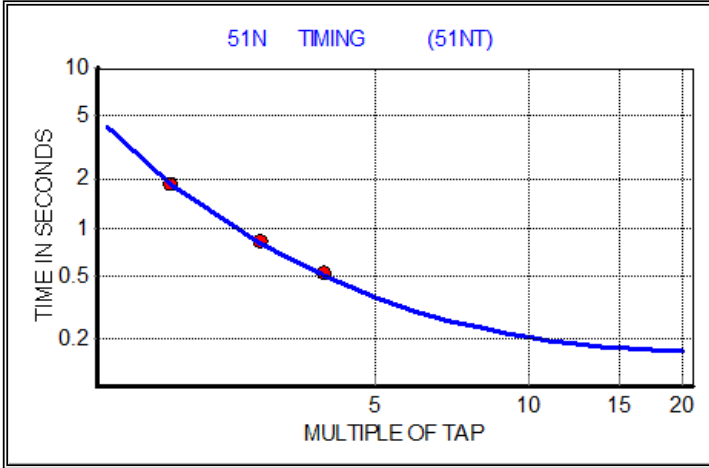
<b>Relay Test Results for:</b>		Z2R REACH TEST	(32QR)			
Z ANGLE	VOLTAGE	CURRENT	IMPEDANCE	IDEAL	%ERROR	OK?
248.86	5.000	4.008	1.248	1.260	-1.00	PASS
278.86	5.000	3.265	1.531	1.455	5.25	PASS
218.86	5.000	3.300	1.515	1.455	4.16	PASS



<b>Relay Test Results for:</b>		51NP PICKUP	(51N)			
PICKUP	CURRENT	IDEAL	%ERROR	OK?		
	1.750	1.750	0.03	PASS		



<b>Relay Test Results for:</b> 51N TIMING (51NT)						
MULTIPLE	VALUE	TIME(CY)	TIME(SEC)	IDEAL	%ERROR	OK?
2.00	3.500	111.01	1.850	1.839	0.62	PASS
3.00	5.250	47.92	0.799	0.785	1.72	PASS
4.00	7.000	30.32	0.505	0.490	3.11	PASS



<b>Relay Test Results for:</b> 27P1P UV PICKUP (27A1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
62.000	62.000	62.000	0.00	PASS		

<b>Relay Test Results for:</b> 27P1P 3PH PICKUP (3P27)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
62.000	62.000	62.000	0.00	PASS		

<b>Relay Test Results for:</b> 27P2P UV PICKUP (27A2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
55.000	55.000	55.000	0.00	PASS		

<b>Relay Test Results for:</b> 27PP UV PICKUP (27AB)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
55.000	55.000	55.000	-0.00	PASS		

<b>Relay Test Results for:</b> 59P1P OV PICKUP (59A1)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
130.000	130.000	130.000	0.00	PASS		

<b>Relay Test Results for:</b> 59P1P OV 3PH PU (3P59)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
130.000	130.000	130.000	0.00	PASS		

<b>Relay Test Results for:</b> 59P2P OV PICKUP (59A2)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
135.000	135.000	135.000	-0.00	PASS		

<b>Relay Test Results for:</b> 59PP OV PICKUP (59AB)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
134.999	135.000	135.000	-0.00	PASS		

<b>Relay Test Results for:</b> 25VLO VP THRESHOLD (59VP)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
62.000	62.000	62.000	-0.00	PASS		

<b>Relay Test Results for:</b> 25VHI VP THRESHOLD (59VP)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
76.000	76.000	76.000	-0.00	PASS		

<b>Relay Test Results for:</b> 27SP UV VS PICKUP (27S)						
PICKUP	VOLTS	IDEAL	%ERROR	OK?		
10.000	10.000	10.000	0.00	PASS		

<b>Relay Test Results for:</b> 25VLO VS THRESHOLD (59VS)				
PICKUP VOLTS	IDEAL	%ERROR	OK?	
62.000	62.000	-0.00	PASS	
<b>Relay Test Results for:</b> 25VHI VS THRESHOLD (59VS)				
PICKUP VOLTS	IDEAL	%ERROR	OK?	
76.000	76.000	-0.00	PASS	
<b>Relay Test Results for:</b> 25ANG1 SYNC ANGLE (25A1)				
LAGGING ANGLE	IDEAL	RANGE	OK?	
14.00	15.00	11.00 TO 19.00	PASS	
LEADING ANGLE	IDEAL	RANGE	OK?	
346.00	345.00	341.00 TO 349.00	PASS	
<b>Relay Test Results for:</b> 25ANG2 SYNC ANGLE (25A2)				
LAGGING ANGLE	IDEAL	RANGE	OK?	
14.00	15.00	11.00 TO 19.00	PASS	
LEADING ANGLE	IDEAL	RANGE	OK?	
346.00	345.00	341.00 TO 349.00	PASS	
<b>Relay Test Results for:</b> 25SF SLIP FREQUENCY (SF)				
DROPOUT HZ	IDEAL	RANGE	OK?	
59.950	59.958	59.908 TO 60.008	PASS	

Customer 8003205 ELECTRICAL TESTING INC.  
Sub-Name VAULT

City ROME, GA  
Unit No.

Location  
Other 07-324

**NAMEPLATE DATA**

Manufacturer	WESTINGHOUSE	Equipment Type	TRANSFORMER
Manufacture Date		Transformer Class	
Serial No.	81JC413258	Impedance %	0.00
KVA Rating	750	Phase/Cycle	
High Voltage	13,095	Liquid Type	OIL
Low Voltage	480	Gallons	325
Weight		Other Access	

**ADDITIONAL EQUIPMENT**

Radiators		Conservator Tank
Fans		LTC Compartment
Water Cooled		Bushing Location
Oil Pumps		Breather
Top FPV (inch)	0.00	Hose Length (feet)
Bottom FPV (inch)	0.00	Service Online
InsulationType		Power Available

**VISUAL INSPECTION**

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
02/22/08	NORMAL		38			
01/10/14		35	45			

**FIELD SERVICE**

DATE	SERVICE

**Additional Information**

Reason Not Tested

**LIQUID SCREEN TEST DATA**

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
02/22/08		0.030 AC	41.6 AC	44 AC			1.00 AC	0.880 AC	CLEAR AC	NONE AC
01/10/14		0.030 AC	41.0 AC	54 AC			1.00 AC	0.880 AC	CLEAR AC	NONE AC

**INHIBITOR CONTENT**

DATE	PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

**LIQUID POWER FACTOR**

DATE	25 C	100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: \* After a result indicates that the test or service was performed by an outside source.

Customer 8003205 ELECTRICAL TESTING INC.

S/N 81JC413258

Sub-Name VAULT

Mfg. WESTINGHOUSE

Location

Unit No.

Gallons 325  
KVA 750

High Volt. 13,095  
Low Volt. 480

**KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM**

DATE	AVG. TEMP	PPM	PCT. SATURATION	AC	MOISTURE BY DRY WEIGHT PCT.
02/22/08	28	8	10.5	AC	1.16
01/10/14	40	2	1.2	AC	0.11

**RECOMMENDATION** RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

**FURAN ANALYSIS EXPRESSED IN PPB**

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
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**GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM**

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
02/22/08	26	10,257	79,543	22	1,073	5,300	6	23	ND	1,150	96,250
01/10/14	26	8,062	72,883	32	1,423	8,591	8	26	2	1,517	91,053

**RECOMMENDATION** RETEST 6 MONTHS

K-THE SMALL AMOUNT OF ACETYLENE, EVEN WITHOUT ELEVATED LEVELS OF OTHER COMBUSTIBLE GASES, INDICATES A POSSIBLE ARCING/SPARKING CONDITION OR OTHER SEVERE ELECTRICAL STRESS. POSSIBLE CAUSES INCLUDE ABNORMALITIES RELATED TO DETERIORATED TAP CHANGER CONTACTS, INTERNAL CONNECTIONS, OR THE CORE ASSEMBLY.

**ICP METALS-IN-OIL EXPRESSED IN PPM**

DATE	ALUMINUM	IRON	COPPER
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**PCB CONTENT EXPRESSED IN PPM**

DATE	1242	1254	1260	OTHER	TOTAL
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**NOTE:** \* After a result indicates that the test or service was performed by an outside source.

Customer 8003205 ELECTRICAL TESTING INC.  
 Sub-Name GAINSVILLE,FL.

City ROME, GA  
 Unit No.

Location  
 Other

**NAMEPLATE DATA**

Manufacturer SQUARE D  
 Manufacture Date 12/01/1997  
 Serial No. 960316-B1  
 KVA Rating 1,500  
 High Voltage 12,470  
 Low Voltage 480 Y  
 Weight  
 Equipment Type TRANSFORMER  
 Transformer Class  
 Impedance % 0.00  
 Phase/Cycle  
 Liquid Type OIL  
 Gallons 310  
 Other Access BOLTED TOP

**ADDITIONAL EQUIPMENT**

Radiators  
 Fans  
 Water Cooled  
 Oil Pumps  
 Top FPV (inch) 0.00  
 Bottom FPV (inch) 0.00  
 InsulationType  
 Conservator Tank  
 LTC Compartment  
 Bushing Location  
 Breather  
 Hose Length (feet)  
 Service Online  
 Power Available

**VISUAL INSPECTION**

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
03/01/08	NORMAL		50			
01/10/14		40	54			

**FIELD SERVICE**

DATE SERVICE

**Additional Information**

Reason Not Tested

**LIQUID SCREEN TEST DATA**

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
03/01/08		0.020 AC	40.5 AC	44 AC			0.75 AC	0.880 AC	CLEAR AC	NONE AC
01/10/14		0.020 AC	41.7 AC	45 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC

**INHIBITOR CONTENT**

DATE PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

**LIQUID POWER FACTOR**

DATE 25 C 100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: \* After a result indicates that the test or service was performed by an outside source.

**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSVILLE,FL.  
**Location**

**S/N** 960316-B1  
**Mfg.** SQUARE D  
**Unit No.**

**Gallons** 310  
**KVA** 1,500

**High Volt.** 12,470  
**Low Volt.** 480

**KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM**

DATE	AVG. TEMP	PPM	PCT. SATURATION	MOISTURE BY DRY WEIGHT PCT.
03/01/08	40	3	2.1 AC	0.18
01/10/14	45	4	2.8 AC	0.21

**RECOMMENDATION** RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

**FURAN ANALYSIS EXPRESSED IN PPB**

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
------	------	------	------	------	------	-------

**GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM**

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
03/01/08	62	7,122	86,652	17	870	4,247	4	26	ND	979	99,000
01/10/14	48	10,020	79,830	20	1,044	5,260	5	36	ND	1,153	96,263

**RECOMMENDATION** RETEST 1 YEAR

B-THE ANALYSIS OF THIS SAMPLE SHOWS NO SIGNIFICANT INCREASE IN THE COMBUSTIBLE GAS VOLUME. THIS INDICATES NORMAL OPERATION.

**ICP METALS-IN-OIL EXPRESSED IN PPM**

DATE	ALUMINUM	IRON	COPPER
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**PCB CONTENT EXPRESSED IN PPM**

DATE	1242	1254	1260	OTHER	TOTAL
------	------	------	------	-------	-------

**NOTE:** \* After a result indicates that the test or service was performed by an outside source.

Customer 8003205 ELECTRICAL TESTING INC.  
 Sub-Name GAINSVILLE,FL.

City ROME, GA  
 Unit No.

Location  
 Other

**NAMEPLATE DATA**

Manufacturer SQUARE D  
 Manufacture Date 12/01/1997  
 Serial No. 960316-A2  
 KVA Rating 1,500  
 High Voltage 12,470  
 Low Voltage 480 Y  
 Weight  
 Equipment Type TRANSFORMER  
 Transformer Class  
 Impedance % 0.00  
 Phase/Cycle  
 Liquid Type OIL  
 Gallons 310  
 Other Access BOLTED TOP

**ADDITIONAL EQUIPMENT**

Radiators  
 Fans  
 Water Cooled  
 Oil Pumps  
 Top FPV (inch) 0.00  
 Bottom FPV (inch) 0.00  
 InsulationType  
 Conservator Tank  
 LTC Compartment  
 Bushing Location  
 Breather  
 Hose Length (feet)  
 Service Online  
 Power Available

**VISUAL INSPECTION**

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
03/01/08	NORMAL		48			
01/10/14		41	50			

**FIELD SERVICE**

DATE	SERVICE

**Additional Information**

Reason Not Tested

**LIQUID SCREEN TEST DATA**

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
03/01/08		0.010 AC	41.5 AC	46 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
01/10/14		0.020 AC	41.1 AC	50 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC

**INHIBITOR CONTENT**

DATE PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

**LIQUID POWER FACTOR**

DATE 25 C 100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: \* After a result indicates that the test or service was performed by an outside source.

**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSVILLE,FL.  
**Location**

**S/N** 960316-A2  
**Mfg.** SQUARE D  
**Unit No.**

**Gallons** 310  
**KVA** 1,500

**High Volt.** 12,470  
**Low Volt.** 480

**KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM**

DATE	AVG. TEMP	PPM	PCT. SATURATION	AC	MOISTURE BY DRY WEIGHT PCT.
03/01/08	38	5	4.0	AC	0.37
01/10/14	46	1	0.7	AC	0.05

**RECOMMENDATION** RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

**FURAN ANALYSIS EXPRESSED IN PPB**

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
------	------	------	------	------	------	-------

**GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM**

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
03/01/08	40	4,709	81,080	15	758	4,126	4	19	ND	836	90,751
01/10/14	25	9,137	80,854	20	1,062	5,413	6	24	ND	1,137	96,541

**RECOMMENDATION** RETEST 6 MONTHS

C-ELEVATED LEVELS OF CARBON MONOXIDE AND/OR CARBON DIOXIDE INDICATE THE CELLULOSIC INSULATION MAY HAVE BEEN OVERHEATED OR IS DETERIORATING. POSSIBLE CAUSES INCLUDE OVERLOADING THE UNIT FOR EXTENDED PERIODS OF TIME, INEFFECTIVE COOLERS, AND OXIDATION. IF APPLICABLE, FURAN RESULTS SHOULD BE CONSULTED TO AID DIAGNOSIS.

**ICP METALS-IN-OIL EXPRESSED IN PPM**

DATE	ALUMINUM	IRON	COPPER
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**PCB CONTENT EXPRESSED IN PPM**

DATE	1242	1254	1260	OTHER	TOTAL
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**NOTE:** \* After a result indicates that the test or service was performed by an outside source.



**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSEVILLE VA CENTER

**City** ROME, GA  
**Unit No.**

**Location**  
**Other**

**NAMEPLATE DATA**

**Manufacturer** SQUARE D  
**Equipment Type** TRANSFORMER  
**Manufacture Date** 12/01/1997  
**Transformer Class**  
**Serial No.** 960316-A1  
**Impedance %** 0.00  
**KVA Rating** 1,500  
**Phase/Cycle**  
**High Voltage** 12,470  
**Liquid Type** OIL  
**Low Voltage** 480  
**Gallons** 310  
**Weight**  
**Other Access** BOLTED TOP

**ADDITIONAL EQUIPMENT**

**Radiators**  
**Fans**  
**Water Cooled**  
**Oil Pumps**  
**Top FPV (inch)** 0.00  
**Bottom FPV (inch)** 0.00  
**InsulationType**  
**Conservator Tank**  
**LTC Compartment**  
**Bushing Location**  
**Breather**  
**Hose Length (feet)**  
**Service Online**  
**Power Available**

**VISUAL INSPECTION**

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
04/16/08	NORMAL		40			
01/10/14		48	81			

**FIELD SERVICE**

DATE	SERVICE

**Additional Information**

Reason Not Tested

**LIQUID SCREEN TEST DATA**

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
04/16/08		0.020 AC	40.1 AC	43 AC			0.75 AC	0.890 AC	CLEAR AC	NONE AC
01/10/14		0.020 AC	39.5 AC	54 AC			1.50 AC	0.890 AC	CLEAR AC	NONE AC

**INHIBITOR CONTENT**

DATE	PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

**LIQUID POWER FACTOR**

DATE	25 C	100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: \* After a result indicates that the test or service was performed by an outside source.

**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSEVILLE VA CENTER  
**Location**

**S/N** 960316-A1  
**Mfg.** SQUARE D  
**Unit No.**

**Gallons** 310  
**KVA** 1,500  
**High Volt.** 12,470  
**Low Volt.** 480

**KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM**

DATE	AVG. TEMP	PPM	PCT. SATURATION	MOISTURE BY DRY WEIGHT PCT.
04/16/08	30	14	16.3 QU	1.76
01/10/14	53	2	1.0 AC	0.07

**RECOMMENDATION** RETEST 1 YEAR

The moisture content has decreased since our last analysis. If service has not been performed, this may be due to temperature and/or operational changes. Continued normal monitoring is indicated.

**FURAN ANALYSIS EXPRESSED IN PPB**

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
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**GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM**

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
04/16/08	43	9,549	83,023	12	922	5,421	3	26	ND	1,006	98,999
01/10/14	36	9,962	82,308	26	1,343	8,004	6	50	ND	1,461	101,735

**RECOMMENDATION** RETEST 6 MONTHS

C-ELEVATED LEVELS OF CARBON MONOXIDE AND/OR CARBON DIOXIDE INDICATE THE CELLULOSIC INSULATION MAY HAVE BEEN OVERHEATED OR IS DETERIORATING. POSSIBLE CAUSES INCLUDE OVERLOADING THE UNIT FOR EXTENDED PERIODS OF TIME, INEFFECTIVE COOLERS, AND OXIDATION. IF APPLICABLE, FURAN RESULTS SHOULD BE CONSULTED TO AID DIAGNOSIS.

**ICP METALS-IN-OIL EXPRESSED IN PPM**

DATE	ALUMINUM	IRON	COPPER
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**PCB CONTENT EXPRESSED IN PPM**

DATE	1242	1254	1260	OTHER	TOTAL
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**NOTE:** \* After a result indicates that the test or service was performed by an outside source.

**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSVILLE VA CENTER

**City** ROME, GA  
**Unit No.**

**Location**  
**Other**

**NAMEPLATE DATA**

**Manufacturer** SQUARE D  
**Equipment Type** TRANSFORMER  
**Manufacture Date** 12/01/1997  
**Transformer Class**  
**Serial No.** 960316-B2  
**Impedance %** 0.00  
**KVA Rating** 1,500  
**Phase/Cycle**  
**High Voltage**  
**Liquid Type** OIL  
**Low Voltage**  
**Gallons** 310  
**Weight**  
**Other Access** BOLTED TOP

**ADDITIONAL EQUIPMENT**

**Radiators**  
**Fans**  
**Water Cooled**  
**Oil Pumps**  
**Top FPV (inch)** 0.00  
**Bottom FPV (inch)** 0.00  
**InsulationType**  
**Conservator Tank**  
**LTC Compartment**  
**Bushing Location**  
**Breather**  
**Hose Length (feet)**  
**Service Online**  
**Power Available**

**VISUAL INSPECTION**

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
04/16/08	NORMAL		38			
01/10/14		40	80			

**FIELD SERVICE**

DATE	SERVICE

**Additional Information**

Reason Not Tested

**LIQUID SCREEN TEST DATA**

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
04/16/08		0.020 AC	39.7 AC	36 AC			1.00 AC	0.890 AC	CLEAR AC	NONE AC
01/10/14		0.020 AC	39.9 AC	51 AC			1.50 AC	0.890 AC	CLEAR AC	NONE AC

**INHIBITOR CONTENT**

DATE PCT. BY WEIGHT

NOTE - TESTING FOR INHIBITOR CONTENT IS USEFUL, SINCE INHIBITOR SLOWS THE AGING RATE OF THE INSULATION SYSTEM.

**LIQUID POWER FACTOR**

DATE 25 C 100 C

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: \* After a result indicates that the test or service was performed by an outside source.

**Customer** 8003205 ELECTRICAL TESTING INC.  
**Sub-Name** GAINSVILLE VA CENTER  
**Location**

**S/N** 960316-B2  
**Mfg.** SQUARE D  
**Unit No.**

**Gallons** 310  
**KVA** 1,500

**High Volt.**  
**Low Volt.**

**KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM**

DATE	AVG. TEMP	PPM	PCT. SATURATION	AC	MOISTURE BY DRY WEIGHT PCT.
04/16/08	28	6	7.2	AC	0.80
01/10/14	45	1	0.7	AC	0.05

**RECOMMENDATION** RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

**FURAN ANALYSIS EXPRESSED IN PPB**

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
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**GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM**

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
04/16/08	26	2,494	66,602	14	850	4,246	3	14	ND	907	74,249
01/10/14	12	10,208	75,865	28	919	6,591	7	34	ND	1,000	93,664

**RECOMMENDATION** RETEST 1 YEAR

B-THE ANALYSIS OF THIS SAMPLE SHOWS NO SIGNIFICANT INCREASE IN THE COMBUSTIBLE GAS VOLUME. THIS INDICATES NORMAL OPERATION.

**ICP METALS-IN-OIL EXPRESSED IN PPM**

DATE	ALUMINUM	IRON	COPPER
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**PCB CONTENT EXPRESSED IN PPM**

DATE	1242	1254	1260	OTHER	TOTAL
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**NOTE:** \* After a result indicates that the test or service was performed by an outside source.