

MAY 12 1997
Sta. 16

58

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

621328

2. To: (Receiving Organization) PUREX DEACTIVATION PROJECT		3. From: (Originating Organization) PUREX ELECTRICAL ENGINEERING		4. Related EDT No.: 621327							
5. Proj./Prog./Dept./Div.: PUREX		6. Design Authority/ Design Agent/Cog. Engr.: DE NELSON		7. Purchase Order No.: N/A							
8. Originator Remarks: ATR REPORT OF FINAL CHECKOUT OF NEW PUREX SUBSTATION AND MINISUBSTATION.				9. Equip./Component No.: N/A							
				10. System/Bldg./Facility: 252AB&AC/202A							
11. Receiver Remarks:		11A. Design Baseline Document? ☒ Yes ☐ No		12. Major Assm. Dwg. No.: N/A							
				13. Permit/Permit Application No.: N/A							
				14. Required Response Date: 5/10/97							
15. DATA TRANSMITTED											
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition			
1	HNF-SD-CP-ATR-089		0	PUREX NEW SUBSTATION ATR	N/A	2	1	1			
16. KEY											
Approval Designator (F)		Reason for Transmittal (G)			Disposition (H) & (I)						
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval 2. Release 3. Information			4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)			1. Approved 2. Approved w/comment 3. Disapproved w/comment			
							4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged				
17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority	N/A								
		Design Agent	N/A								
2	1	Cog. Engr. DE NELSON	<i>David E. Nelson</i>	5/9/97	N/A						
2	1	Cog. Mgr. WA PEIFFER	<i>W. A. Peiffer</i>	5/9/97	N/A						
		QA	N/A								
		Safety	N/A								
		Env.	N/A								
18. <i>David E. Nelson</i> 5/1/97 Signature of EDT Originator		19. <i>David E. Nelson</i> 5/1/97 Authorized Representative for Receiving Organization		20. <i>W. A. Peiffer</i> 5/1/97 Design Authority Cognizant Manager		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					

PUREX NEW SUBSTATION ATR

DAVID E. NELSON

B&W HANFORD CO., Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 621328

UC: 2050

Org Code: 17560

Charge Code: KP4BA

B&R Code: EW7003000

Total Pages: 328 ~~329~~

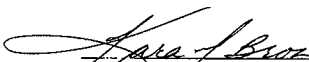
Key Words: SUBSTATION, ATR, MINISUBSTATION

Abstract: THIS DOCUMENT IS THE ACCEPTANCE TEST REPORT (ATR) FOR THE NEW PUREX MAIN AND MINISUBSTATIONS. IT COVERS THE FACTORY AND VENDOR ACCEPTANCE AND COMMISSIONING TEST REPORTS.

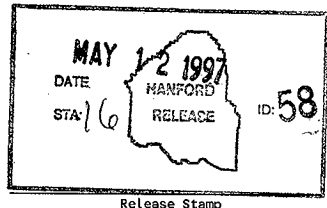
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Release Approval

5/12/97
Date



Release Stamp

Approved for Public Release

PUREX NEW SUBSTATION
ATR

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SECTION 1

MAIN 5 KV SUBSTATION BUILDING FACTORY TEST RESULT

BUILDING TESTING

- A. MECHANICAL OPERATION
- B. CONTROL WIRING CONTINUITY
- C. CONTROL WIRING INSULATION (DIELECTRIC)
- D. SEQUENCED PER SCHEMATICS

BUILDING VERIFICATION

- A. EQUIPMENT/DEVICES VERIFICATION
- B. STRUCTURAL FIT, ALIGNMENT, OPERATION OF MOVING PARTS
- C. INSPECTION OF BUS CONNECTIONS
- D. WIRING CORRECT, NEATNESS, PROPER TERMINATIONS
- E. FINISH, LABELS, TRIM



PROTECT CONTROLS, INC.

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RELEASE FOR THE INTENDED USE

JOB NAME

ULTIMATE USER: PUREX CORPORATION

PCI SHOP

ORDER #: 6508

PURCHASE ORDER

TO PCI: HSW 26522

PCI CUSTOMER: Cutler-Hammer/Westinghouse

DATE: 08-14-96

THE ABOVE DESCRIBED BUILDING OR ENCLOSURE IS IN COMPLIANCE
WITH THE SPECIFICATION REQUIREMENTS OF THE PURCHASE ORDER AND IS
RELEASED FOR THE PURPOSE OF INTENDED USE.

BUILDING INSPECTED:

☒ YES

☐ NO

BUILDING RELEASED BY:

R. Nelson (PCI)

Accepted & Witnessed by:

David E. Nelson

WHC Electrical Project Engineer

8/14/96



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CERTIFIED PRODUCTION TEST REPORT

S.O. NO. 6508

CLIENT: Cutler-Hammer/Westinghouse

CUST. ORDER NO: HSW 26522

EQUIPMENT DESCRIPTION: MAIN 5KV SUBSTATION BUILDING

DRAWINGS: D-6508-100 thru -2100

D-6508-LIFT 1 & LIFT 2

<u>Building Test Report:</u> page 1 thru	PASSED	DOES NOT APPLY
BUILDING TESTING:		
MECHANICAL OPERATION	YES	
CONTROL WIRING CONTINUITY	YES	
CONTROL WIRING INSULATION (DIELECTRIC)	YES	
SEQUENCED PER SCHEMATICS	YES	
BUILDING VERIFICATION:		
EQUIPMENT/DEVICES VERIFICATION	YES	
STRUCTURAL FIT, ALIGNMENT, OPERATION OF MOVING PARTS	YES	
INSPECTION OF BUS CONNECTIONS	YES	
WIRING CORRECT, NEATNESS, PROPER TERMINATIONS	YES	
FINISH, LABELS, TRIM	YES	


QUALITY CONTROL MANAGER
ROLAND KEIZER

August 15, 1996

DATE

ITEM/DESCRIPTION

ACTION TAKEN

BOTH CHARGERS ARE CONNECTED TO THE AC AND DC DISTRIBUTION PANELS. BATTERY CHARGER #1 CONNECTED TO CKT.#9/11, 240V-2P-20A OF MAIN LTG. DIST. PANEL (MLDP). ALL "LED'S" INDICATION AND ALARMS

ITEM/DESCRIPTION	ACTION TAKEN
17. BATTERIES, NICKEL CADMIUM, ALCAD #HP60, 1.2V, 58AH 20. INVERTER, TOPAZ #6115-04, IKVA, INPUT-125VDC, OUTPUT -120VAC	FUNCTION NORMAL. BATTERY CHARGER #2 CONNECTED TO CKT. #13/15, 240V-2P-20A OF MLDP. INDICATING "LED'S" FUNCTION NORMAL ALARM "LED'S" MALFUNCTION NOT CONNECTED SEALED & PACKED IN ORIGINAL FACTORY CRATES. QUANTITY CRATES 3 WITH 32 BATTERIES EACH. THE BYPASS SWITCH INPUT CONNECTED TO CKT #10, 120V-1P-20A OF MLDP. DC INPUT CONNECTED TO CKT #5/7, 125VDC-2P-20A OF DC PANEL AC OUTPUT 120VAC CONNECTED TO COMPUTER RECEPTACLES ALL FUNCTIONS CHECKED, OK..

AIR-CONDITIONER UNITS (2)

ITEM/DESCRIPTION	ACTION TAKEN
12. TWO (2) CARRIER #50TJ012 AIRCONDITIONERS, 10 TONS COOLING/16.5KW HEATING, 460/3/60., 46.5 MCA, COMPLETE WITH CONTROL PANELS AND 3 POLE-60A DISCONNECT SWITCH	460VOLT-3PH-60HZ POWER SUPPLIED FROM THE MCC FRAME 1R, UNIT 2D AND FRAME 1L, UNIT 11D CONTROL PANEL (2): THE "AUTO"/"OFF" SYSTEM SELECTOR SWITCH FOR EACH UNIT TURNED TO THE "AUTO" POSITION AIRCONDITIONER STARTED IMMEDIATELY AND MAINTAINED THE SET TEMP. SETTING IN THE BUILDING. THE UNITS ARE RUNNING INDEPENDENTLY OF EACH OTHER. A 3 POLE-60A DISC. SWITCH MOUNTED NEXT TO EACH A/C UNIT FOR MAINTENANCE. A HIGH-TEMP. ALARM SWITCH AND THE SHUTDOWN RELAY LOCATED IN THE FIRE PANEL WILL SHUT-OFF THE AIRCONDITIONER UNIT RAN FOR 10 DAYS

SECTION 2

MAIN 5 KV SUBSTATION BUILDING FIRE SYSTEM TEST RESULT SYSTEM TEST & ACCEPTANCE

- A. HAND HELD EXTINGUISHERS ON SITE
- B. FIRE SYSTEM FUNCTIONS ARE SUPERVISED
- C. DETECTORS FUNCTION PER DESIGN
- D. ALARMS AND INDICATORS FUNCTION PER DESIGN
- E. AC POWER & DC BACK-UP POWER FUNCTION PER DESIGN
- F. TROUBLE INDICATIONS FUNCTION PER DESIGN
- G. MANUAL STATIONS FUNCTION PER DESIGN

Wilson Fire Equipment & Service Company, Inc.

7070 Empire Central Drive
Houston, TX 77040-3214
(713) 896-4747 • FAX (713) 896-4778

TEST AND ACCEPTANCE REPORT

DATE: 8-12-96
JOB NAME: PROTECT CONTROLS - PUREX JOB NO. 2137 (#6508)
LOCATION: _____
CONTACT: GARY LABLANC
TELEPHONE: 691-5803 PAGER: _____
SYSTEM AND EQUIPMENT TYPE KIDDE - CO² SYSTEM
TECHNICIAN: TERRY WITTORP
ADDITIONAL INFO: _____

CHECK LIST

DATE

- | | |
|--|----------------|
| 1. System check out procedures completed | <u>8-12-96</u> |
| 2. Graphic Annunciator checked out (If Applicable) | <u>N/A</u> |
| 3. As-built Electrical Drawings done | <u>8-9-96</u> |
| 4. Sequence of Events written | <u>8-12-96</u> |
| 5. Shutdowns tested: A.C. | <u>Yes</u> |
| Dampers | <u>N/A</u> |
| E.P.O. | <u>N/A</u> |
| 6. Final inspection with Fire Marshal | <u>N/A</u> |

Accepted by Owners Rep.: Steve R. Blaser

Wilson Fire Equipment & Service Company, Inc.

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Houston, TX 77040-3214
(713) 896-4747 • FAX (713) 896-4778

SYSTEM CHECK OUT

- | | | | |
|--|---|--|---|
| 1. Has the space changed in accordance with the original design? | Yes ☐ | No ☒ | N/A ☐ |
| 2. Are all hand-held fire extinguishers on site per code requirements? (If Applicable) | Yes ☒ | No ☐ | N/A ☐ |
| 3. Are there enough hand-held fire extinguishers on site per code requirements? (If Applicable) | Yes ☒ | No ☐ | N/A ☐ |
| 4. Check all functions that are supervised. For example, remove detector from ceiling; result should be trouble condition. | Yes ☒ | No ☐ | N/A ☐ |
| 5. Each detector reports the alarm condition: | | | |
| • All appropriate alarm bells, horns, strobes, or speakers. | Yes ☒ | No ☐ | N/A ☐ |
| • LED on the detector | Yes ☒ | No ☐ | N/A ☐ |
| • Graphic Annunciator indicator (If Applicable) | Yes ☐ | No ☐ | N/A ☒ |
| • Control Panel zone alarm | Yes ☒ | No ☐ | N/A ☐ |
| • All appropriate alarm interlock functions | Yes ☒ | No ☐ | N/A ☐ |
| 6. All Control and Graphic Annunciator light indicators and audibles work properly. | Yes ☒ | No ☐ | N/A ☐ |
| 7. AC power to Fire Alarm System works. | Yes ☒ | No ☐ | N/A ☐ |
| 8. DC back-up power to Fire Alarm System works upon loss of AC power. | Yes ☒ | No ☐ | N/A ☐ |
| 9. "Trouble" on each detector and each supervised circuit reports properly. | Yes ☒ | No ☐ | N/A ☐ |
| 10. "Trouble Silence" works, leaving only visual indicator. Correction of "trouble" restores audible prior to reset. | Yes ☒ | No ☐ | N/A ☐ |
| 11. Alarm bells, horns, strobes, or speakers sound with proper zones. | Yes ☒ | No ☐ | N/A ☐ |
| 12. Manual Stations actuate proper alarm audibles and visuals; and <u>all</u> appropriate interlock functions | Yes ☒ | No ☐ | N/A ☐ |
| 13. Audibles must be heard clearly throughout the protected areas. | Yes ☒ | No ☐ | N/A ☐ |
| 14. Do Manual Stations comply with ADA? | Yes ☒ | No ☐ | N/A ☐ |
| 15. Do all Strobes comply with ADA? | Yes ☒ | No ☐ | N/A ☐ |

Wilson Fire Equipment & Service Company, Inc.

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GAS DETECTION SYSTEMS

- | | | | |
|--|------------------------------|-----------------------------|---|
| 1. Calibrate gas sensors? | Yes ☐ | No ☐ | N/A ☒ |
| 2. Set Low LEL _____ % | Yes ☐ | No ☐ | N/A ☒ |
| 3. Set High LEL _____ % | Yes ☐ | No ☐ | N/A ☒ |
| 4. Appropriate audibles and/or visuals are activated with Low LEL Alarm ? | Yes ☐ | No ☐ | N/A ☒ |
| 5. Appropriate audibles and/or visuals are activated with High LEL Alarm ? | Yes ☐ | No ☐ | N/A ☒ |
| 6. All appropriate interlock functions (shutdowns, remotes)
report on : | | | |
| Low LEL | Yes ☐ | No ☐ | N/A ☒ |
| High LEL | Yes ☐ | No ☐ | N/A ☒ |
| 7. Trouble Relay and LED works properly on any system trouble. | Yes ☐ | No ☐ | N/A ☒ |
| 8. Are all system wires and functions supervised ? | Yes ☐ | No ☐ | N/A ☒ |

NOTES / DEVIATIONS:

There is no gas for this project

SECTION 3

MINI-SUBSTATION CONTROL BUILDING FACTORY TEST RESULT

BUILDING TESTING

- A. MECHANICAL OPERATION
- B. CONTROL WIRING CONTINUITY
- C. CONTROL WIRING INSULATION (DIELECTRIC)
- D. SEQUENCED PER SCHEMATICS

BUILDING VERIFICATION

- A. EQUIPMENT/DEVICES VERIFICATION
- B. STRUCTURAL FIT, ALIGNMENT, OPERATION OF MOVING PARTS
- C. INSPECTION OF BUS CONNECTIONS
- D. WIRING CORRECT, NEATNESS, PROPER TERMINATIONS
- E. FINISH, LABELS, TRIM



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RELEASE FOR THE INTENDED USE

JOB NAME

ULTIMATE USER: PUREX CORPORATION

PCI SHOP

ORDER #: 6509

PURCHASE ORDER

TO PCI: HSW 26522

PCI CUSTOMER: Cutler-Hammer/Westinghouse

DATE: 08-12-96

THE ABOVE DESCRIBED BUILDING OR ENCLOSURE IS IN COMPLIANCE WITH THE SPECIFICATION REQUIREMENTS OF THE PURCHASE ORDER AND IS RELEASED FOR THE PURPOSE OF INTENDED USE.

BUILDING INSPECTED:

☒ YES

☐ NO

BUILDING RELEASED BY:

[Signature] (PCI)

Accepted & Witnessed by:

David E. Nelson

WHC Electrical Project Engineer

8/14/96

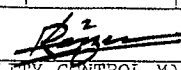
**PROTECT CONTROLS, INC.**

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Phone (713) 691-5183 • FAX. (713) 691-0159

HNF-SD-CP-ATR-089, REV. 0Page 14**CERTIFIED PRODUCTION TEST REPORT**S.O. NO. 6509CLIENT: Cutler-Hammer/Westinghouse CUST. ORDER NO: HSW 26522EQUIPMENT DESCRIPTION: MINI-SUBSTATION CONTROL BUILDINGDRAWINGS: D-6509-100 thru -800

BUILDING TEST REPORT: PAGE 1 THRU 3

	PASSED	DOES NOT APPLY
BUILDING TESTING:		
MECHANICAL OPERATION	YES	
CONTROL WIRING CONTINUITY	YES	
CONTROL WIRING INSULATION (DIELECTRIC)	YES	
SEQUENCED PER SCHEMATICS	YES	
BUILDING VERIFICATION:		
EQUIPMENT/DEVICES VERIFICATION	YES	
STRUCTURAL FIT, ALIGNMENT, OPERATION OF MOVING PARTS	YES	
INSPECTION OF BUS CONNECTIONS	YES	
WIRING CORRECT, NEATNESS, PROPER TERMINATIONS	YES	
FINISH, LABELS, TRIM	YES	


QUALITY CONTROL MANAGER
ROLAND KEIZER

August 15, 1996

DATE

SUBSTATION INTERIOR/EXTERIOR LIGHTS & RECEPTACLES

ITEM/DESCRIPTION

ACTION TAKEN

480VOLT - 3PH- 60HZ., POWER WAS APPLIED (BACK FED) THRU
THE 100A SPARE FEEDER BREAKER (LOAD SIDE) IN FRAME 6,
UNIT 6M

PROPER VOLTAGE SHOWN ON VOLTMETER
THRU VOLTMETER SWITCH, PHASE TO
PHASE: A-B, B-C & A-C, 480VOLT.

MINI-POWER CENTER CONSISTING OF:

480VOLT POWER SUPPLIED FROM MCC
FRAME 5, UNIT 5E

MAIN, 20A-2P

XPMR, 5KVA, 480-240/120V-IPH-60HZ

LTG, PNL., 12CKT-IP/20A W/A 225A MAIN

LTG. PANEL

EA. CIRCUIT FUNCTIONALLY CHECKED

CKT #1 INTERIOR LTS
2 EXT. RECEPT'S
3 INT. RECEPT'S
4 WLI SPACE HTR.
5 EXTERIOR LTS
6/8 750 KVA TRANSF. CONTROL
7 EMER./EXIT LTS
9, 10, 11 & 12 SPARES

OK
OK
OK
OK
OK
OK
OK
OK

AIR CONDITIONER UNITS (1)

ITEM/DESCRIPTION

ACTION TAKEN

1. POWER WAS SUPPLIED TO THE AIR CONDITIONER FROM MCC FRAME 4, UNIT 4M 480VOLT-3PH-15A-60HZ.
2. UNIT HAS A THERMOSTAT THAT CONTROLS THE A/C

SEE RESULT #2

THERMOSTAT WAS MOVED TO THE "ON" POSITION AND TEMP. CONTROL MOVED TO 65 DEG. UNIT CAME ON AND PRODUCED COLD AIR.
UNIT RAN FOR 3 DAYS.

SECTION 4A

MAIN SUBSTATION 5 KV SWITCHGEAR FACTORY TEST RESULT

- A. FABRICATION & LAYOUT
- B. CORRECT DEVICES INSTALLED
- C. LABELS
- D. WIRING & TERMINATIONS
- E. PAINTING AND CLEANLINESS



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET GREENWOOD PLANT CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 1

I HAVE CHECKED

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT)

U 191
L 493

I HAVE CHECKED

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS

809

I HAVE CHECKED

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS

U 493
L 591#9848*

I HAVE CHECKED

FRONT MODULE SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

648
648
648

I HAVE CHECKED

LOW VOLTAGE PANELS AND FIXED PANELS:

1. CORRECT PANEL
2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)
4. WIRING (TERMINAL, WIRE MARKERS, & CRIMPS)
5. CROSS UNIT WIRING

395
395
395
490
1642/166

I HAVE CHECKED

FRONT MODULE HOOKUP:

1. WIRING TERMINAL, WIRE SIZE, WIRE HINGE, WIRE MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED, AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

648

INTERNALS

UPPER 793
LOWER 591#



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

1200AMP ☒ 2000AMP ☐ 3000AMP ☐
5KV ☒ 15KV ☐ 27KV ☐SHOP ORDER: 7715UNIT NUMBER: 1

I HAVE CHECKED: (A-STATION)

599 { MID MODULE ASSY.
MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)
RUN DUMMY BREAKER
CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 4

137 TIE BOLT SHIPPING GROUPS
102 AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
117 BREAKER COMPARTMENT (UPPER) (LOWER)
112 KEY INTERLOCKS (AUX. & BREAKER COMP.)
117 WIRING: (FRONT TO MID MODULE)
11A OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

600 MAIN BUS COMPARTMENT
600 UPPER COMPARTMENT
600 LOWER COMPARTMENT
600 INTERNAL & EXTERNAL DIMENSIONS
600 GEAR RELEASED TO TEST
ELECTRICAL TEST COMPLETE

FINAL PAINT
PREPARATION FOR SHIPMENT

I HAVE CHECKED:

465 PAINTER OF BATCH
465 CLEAN PAINT OVERSPRAY
465 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
N/A RODENT PROOF
N/A DUST PROOF
N/A TAPE ARRESTORS
N/A GREASE STABS (AUX. DRAWERS)

465 CLEAN OUT UNITS
465 TOUCH UP PAINT
465 WRAP PANS-SECURE SHUTTER & BARRIER
4651 INSTALL REAR COVERS
G-51 INSTRUCTION BOOKS INSTALLED
G-51 DETAIL ITEMS CHECKED
G-51 "AS BUILT" DRAWINGS IN DETAIL BOX
N/A CALIF. CODE
G-51 CSA/U.L. LABEL INSTALLED
G-51 ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY WATDATE 7/23/96



Cutler-Hammer

Greenwood, S.C.

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QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 2

I HAVE CHECKED

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT) }

U 191
L 493

I HAVE CHECKED

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS }

504

I HAVE CHECKED

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS }

U 411
L 672-848

I HAVE CHECKED

FRONT MODULE
SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

643
643
643

I HAVE CHECKED

LOW VOLTAGE PANELS
AND FIXED PANELS:

1. CORRECT PANEL
2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)
4. WIRING (TERMINAL, WIRE MARKERS,
& CRIMPS)
5. CROSS UNIT WIRING

395
395
395
490
164/166

I HAVE CHECKED

FRONT MODULE
HOOKUP:

1. WIRING TERMINAL, WIRE
SIZE, WIRE HINGE, WIRE
MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED,
AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

643

INTERNALS

UPPER 411
LOWER 672



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☒ 2000AMP ☐ 3000AMP ☐
 5KV ☒ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 2

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
 MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)
 RUN DUMMY BREAKER
 CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 4

265 TIE BOLT SHIPPING GROUPS
N/A AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
765 BREAKER COMPARTMENT (UPPER) (LOWER)
N/A KEY INTERLOCKS (AUX. & BREAKER COMP.)
765 WIRING: (FRONT TO MID MODULE)
N/A OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

629-176 MAIN BUS COMPARTMENT
629-176 UPPER COMPARTMENT
629-176 LOWER COMPARTMENT
N/A INTERNAL & EXTERNAL DIMENSIONS
629-176 BEAR RELEASED TO TEST

_____ ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

465 PAINTER OF BATCH
465 CLEAN PAINT OVERSPRAY
465 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
N/A RODENT PROOF
N/A DUST PROOF
N/A TAPE ARRESTORS
N/A GREASE STABS (AUX. DRAWERS)

465 CLEAN OUT UNITS
465 TOUCH UP PAINT
465 WRAP PANS-SECURE SHUTTER & BARRIER
465 G-51 INSTALL REAR COVERS
N/A INSTRUCTION BOOKS INSTALLED
N/A DETAIL ITEMS CHECKED
N/A "AS BUILT" DRAWINGS IN DETAIL BOX
N/A CALIF. CODE
N/A CSA/U.L. LABEL INSTALLED
N/A ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY _____

DATE 7/23/96

**Cutler-Hammer**

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLESHOP ORDER: 7715
UNIT NUMBER: 3

I HAVE CHECKED

LAYOUT PANELS:

1. CORRECT PANEL
-
2. DEVICES (LEVEL & CORRECT) }

U 191
L 493

I HAVE CHECKED

FRONT MODULE:

1. MODULE ASSEMBLY
-
2. TERMINAL BLOCKS
-
3. LABEL T. BLOCKS }

809

I HAVE CHECKED

WIRING OF PANELS:

1. WIRE SIZE
-
2. TERMINALS
-
3. WIRE MARKERS }

U 813 1218
L NA

I HAVE CHECKED

FRONT MODULE
SHIPPING GROUPS:

1. HINGE PANELS
-
2. TIE BOLT SHIPPING GROUP
-
3. SHORTAGES

684
684
684

I HAVE CHECKED

LOW VOLTAGE PANELS
AND FIXED PANELS:

1. CORRECT PANEL
-
2. DEVICE (LEVEL & CORRECT)
-
3. NAME PLATE (LEVEL & CORRECT)

395395395

4. WIRING (TERMINAL, WIRE MARKERS,
-
- & CRIMPS)
-
5. CROSS UNIT WIRING

490
164-166

I HAVE CHECKED

FRONT MODULE
HOOKUP:

1. WIRING TERMINAL, WIRE
-
- SIZE, WIRE HINGE, WIRE
-
- MARKERS & CRIMPS
-
2. T.B. (MARKING STRIPS)
-
3. SHORTAGE (ID, WIRED,
-
- AND VERIFIED)
-
4. JUMPERS
-
5. PANDUIT & COVERS
-
6. LOOSE CONNECTIONS
-
7. CLEAN OUT UNIT

684INTERNALS 813
UPPER NA
LOWER NA



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☐ 2000AMP ☐ 3000AMP ☐
 5KV ☒ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 3

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
 MAIN CONTACT ASSY. (GLASS POLYESTER/PORCELAIN-EPOXY)
 RUN DUMMY BREAKER
 CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 4

177 TIE BOLT SHIPPING GROUPS
 AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
77 BREAKER COMPARTMENT (UPPER) (LOWER)
23 KEY INTERLOCKS (AUX. & BREAKER COMP.)
121 WIRING: (FRONT TO MID MODULE)
 OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

629-176 MAIN BUS COMPARTMENT
629-176 UPPER COMPARTMENT
629-176 LOWER COMPARTMENT
176 INTERNAL & EXTERNAL DIMENSIONS
629-176 GEAR RELEASED TO TEST

_____ ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

465 PAINTER OF BATCH
465 CLEAN PAINT OVERSPRAY
465 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
177 RODENT PROOF
177 DUST PROOF
177 TAPE ARRESTORS
177 GREASE STABS (AUX. DRAWERS)

465 CLEAN OUT UNITS
465 TOUCH UP PAINT
465 WRAP PANS-SECURE SHUTTER & BARRIER
G-51 INSTALL REAR COVERS
177 INSTRUCTION BOOKS INSTALLED
177 DETAIL ITEMS CHECKED
177 "AS BUILT" DRAWINGS IN DETAIL BOX
177 CALIF. CODE
177 CSA/U.L. LABEL INSTALLED
177 ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY _____

DATE 7/23/96

G-57



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET GREENWOOD PLANT CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 4

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT) }

I HAVE CHECKED

U 191
L 193

I HAVE CHECKED

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS

809

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS

I HAVE CHECKED

U 644
L N/A

I HAVE CHECKED

FRONT MODULE SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

68V
68V
88V

LOW VOLTAGE PANELS AND FIXED PANELS:

1. CORRECT PANEL
2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)
4. WIRING (TERMINAL, WIRE MARKERS, & CRIMPS)
5. CROSS UNIT WIRING

I HAVE CHECKED

395
395
395
490
1644 1646

I HAVE CHECKED

FRONT MODULE HOOKUP:

1. WIRING TERMINAL, WIRE SIZE, WIRE HINGE, WIRE MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED, AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

68V

INTERNALS

UPPER 644
LOWER 644



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☒ 2000AMP ☐ 3000AMP ☐
 5KV ☒ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 4

I HAVE CHECKED: (A-STATION)

599

MID MODULE ASSY.

MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)

RUN DUMMY BREAKER

CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 4

600 TIE BOLT SHIPPING GROUPS
N/A AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
600 BREAKER COMPARTMENT (UPPER) (LOWER)
N/A KEY INTERLOCKS (AUX. & BREAKER COMP.)
600 WIRING: (FRONT TO MID MODULE)
N/A OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

600 MAIN BUS COMPARTMENT
600 UPPER COMPARTMENT
~~600~~ LOWER COMPARTMENT
600 INTERNAL & EXTERNAL DIMENSIONS
600 GEAR RELEASED TO TEST

____ ELECTRICAL TEST COMPLETE

 FINAL PAINT
 PREPARATION FOR SHIPMENT

I HAVE CHECKED:

465 PAINTER OF BATCH
465 CLEAN PAINT OVERSPRAY
465 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
~~465~~ RODENT PROOF
N/A DUST PROOF
N/A TAPE ARRESTORS
N/A GREASE STABS (AUX. DRAWERS)

465 CLEAN OUT UNITS
465 TOUCH UP PAINT
465 WRAP PANS-SECURE SHUTTER & BARRIER
~~465~~ INSTALL REAR COVERS
N/A INSTRUCTION BOOKS INSTALLED
N/A DETAIL ITEMS CHECKED
N/A "AS BUILT" DRAWINGS IN DETAIL BOX
N/A CALIF. CODE
N/A CSA/U.L. LABEL INSTALLED
N/A ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY 1188DATE 7/23/96
 W
 G-57



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLESHOP ORDER: 7715
UNIT NUMBER: 5

I HAVE CHECKED

LAYOUT PANELS:

- 1. CORRECT PANEL
- 2. DEVICES (LEVEL & CORRECT) }

U 191
L 493

FRONT MODULE:

- 1. MODULE ASSEMBLY
- 2. TERMINAL BLOCKS
- 3. LABEL T. BLOCKS }

I HAVE CHECKED

809

I HAVE CHECKED

WIRING OF PANELS:

- 1. WIRE SIZE
- 2. TERMINALS
- 3. WIRE MARKERS }

U 727-208
L N/AFRONT MODULE
SHIPPING GROUPS:

- 1. HINGE PANELS
- 2. TIE BOLT SHIPPING GROUP
- 3. SHORTAGES

I HAVE CHECKED

684
688
688

I HAVE CHECKED

LOW VOLTAGE PANELS
AND FIXED PANELS:

- 1. CORRECT PANEL
- 2. DEVICE (LEVEL & CORRECT)
- 3. NAME PLATE (LEVEL & CORRECT)
- 4. WIRING (TERMINAL, WIRE MARKERS,
& CRIMPS)
- 5. CROSS UNIT WIRING

395
395
395
490
164-164FRONT MODULE
HOOKUP:

- 1. WIRING TERMINAL, WIRE
SIZE, WIRE HINGE, WIRE
MARKERS & CRIMPS
- 2. T.B. (MARKING STRIPS)
- 3. SHORTAGE (ID, WIRED,
AND VERIFIED)
- 4. JUMPERS
- 5. PANDUIT & COVERS
- 6. LOOSE CONNECTIONS
- 7. CLEAN OUT UNIT

I HAVE CHECKED

684

INTERNALS

UPPER 727
LOWER 727



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

1200AMP ☒ 2000AMP ☐ 3000AMP ☐
5KV ☒ 15KV ☐ 27KV ☐SHOP ORDER: 7715UNIT NUMBER: 5

I HAVE CHECKED: (A-STATION)

599

MID MODULE ASSY.

MAIN CONTACT ASSY. (GLASS POLYESTER PORCELAIN-EPOXY)

RUN DUMMY BREAKER

CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 4265

TIE BOLT SHIPPING GROUPS

265

AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)

265

BREAKER COMPARTMENT (UPPER) (LOWER)

265

KEY INTERLOCKS (AUX. & BREAKER COMP.)

265

WIRING: (FRONT TO MID MODULE)

265

OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

629-176

MAIN BUS COMPARTMENT

629-176

UPPER COMPARTMENT

629-176

LOWER COMPARTMENT

NA

INTERNAL & EXTERNAL DIMENSIONS

629-176

GEAR RELEASED TO TEST

ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

461

PAINTER OF BATCH

461

CLEAN PAINT OVERSPRAY

461

N.P.'S-DECALS-WARNING LABELS-MIMIC BUS

NA

RODENT PROOF

NA

DUST PROOF

NA

TAPE ARRESTORS

639

GREASE STABS (AUX. DRAWERS)

461

CLEAN OUT UNITS

461

TOUCH UP PAINT

461

WRAP PANS-SECURE SHUTTER & BARRIER

461

INSTALL REAR COVERS

NA

INSTRUCTION BOOKS INSTALLED

NA

DETAIL ITEMS CHECKED

NA

"AS BUILT" DRAWINGS IN DETAIL BOX

NA

CALIF. CODE

NA

CSA/U.L. LABEL INSTALLED

NA

ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY NADATE 7/23/96

**Cutler-Hammer**

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 6

I HAVE CHECKED

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT)

U N/A
L 11/14/83

I HAVE CHECKED

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS

809

I HAVE CHECKED

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS

U N/A
L 682

I HAVE CHECKEDFRONT MODULE
SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

850
850
850

I HAVE CHECKEDLOW VOLTAGE PANELS
AND FIXED PANELS:

1. CORRECT PANEL

2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)

4. WIRING (TERMINAL, WIRE MARKERS,
& CRIMPS)
5. CROSS UNIT WIRING

395
395
395
490
10-11/100

I HAVE CHECKEDFRONT MODULE
HOOKUP:

1. WIRING TERMINAL, WIRE
SIZE, WIRE HINGE, WIRE
MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED,
AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

850

INTERIALS

UPPER N/A
LOWER 682



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☐ 2000AMP ☐ 3000AMP ☐
 5KV ☒ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 6

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
 MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)
 RUN DUMMY BREAKER
 CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 6

308/ TIE BOLT SHIPPING GROUPS
308/ AUX. COMPARTMENT (PT CPT-FUSE) (U1-U2, L1-L2) (L.A.-CAP.)
308/ BREAKER COMPARTMENT (UPPER) (LOWER)
NA KEY INTERLOCKS (AUX. & BREAKER COMP.)
308/ WIRING: (FRONT TO MID MODULE)
NA OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

308/ MAIN BUS COMPARTMENT
308/ UPPER COMPARTMENT
308/ LOWER COMPARTMENT
308/ INTERNAL & EXTERNAL DIMENSIONS
308/ GEAR RELEASED TO TEST
308/ ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

NA PAINTER OF BATCH
NA CLEAN PAINT OVERSPRAY
639 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
NA RODENT PROOF
NA DUST PROOF
NA TAPE ARRESTORS
639 GREASE STABS (AUX. DRAWERS)

639 CLEAN OUT UNITS
639 TOUCH UP PAINT
639 WRAP PANS-SECURE SHUTTER & BARRIER
G-51 INSTALL REAR COVERS
NA INSTRUCTION BOOKS INSTALLED
NA DETAIL ITEMS CHECKED
NA "AS BUILT" DRAWINGS IN DETAIL BOX
NA CALIF. CODE
NA CSA/U.L. LABEL INSTALLED
NA ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY MDDATE 7/23/96
 WP
 G-57



Cutler-Hammer

Greenwood, S.C.

HNF-SD-CP-ATR-089, REV. 0

Page 30

QUALITY CHECK SHEET GREENWOOD PLANT CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 7

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT)

I HAVE CHECKED

U 191
L 191

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS

I HAVE CHECKED

131

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS

I HAVE CHECKED

U 8/11/11
L 11/11/11

FRONT MODULE SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

I HAVE CHECKED

526
526
526

LOW VOLTAGE PANELS AND FIXED PANELS:

1. CORRECT PANEL
2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)
4. WIRING (TERMINAL, WIRE MARKERS, & CRIMPS)
5. CROSS UNIT WIRING

I HAVE CHECKED

395
395
395
N/A
126/100

FRONT MODULE HOOKUP:

1. WIRING TERMINAL, WIRE SIZE, WIRE HINGE, WIRE MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED, AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

I HAVE CHECKED

526

INTERNALS

UPPER 22411
LOWER 22411



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

1200AMP ☐ 2000AMP ☐ 3000AMP ☐
5KV ☒ 15KV ☐ 27KV ☐SHOP ORDER: 7715UNIT NUMBER: 7

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
MAIN CONTACT ASSY. (GLASS-POLYESTER-PORCELAIN-EPOXY)
RUN DUMMY BREAKER
CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 6

265 TIE BOLT SHIPPING GROUPS
265 AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
NA BREAKER COMPARTMENT (UPPER) (LOWER)
NA KEY INTERLOCKS (AUX. & BREAKER COMP.)
265 WIRING: (FRONT TO MID MODULE)
NA OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

308 MAIN BUS COMPARTMENT
308 UPPER COMPARTMENT
308 LOWER COMPARTMENT
308 INTERNAL & EXTERNAL DIMENSIONS
308 GEAR RELEASED TO TEST
W
100 ELECTRICAL TEST COMPLETE

FINAL PAINT
PREPARATION FOR SHIPMENT

I HAVE CHECKED:

NA PAINTER OF BATCH
NA CLEAN PAINT OVERSPRAY
639 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
NA RODENT PROOF
NA DUST PROOF
NA TAPE ARRESTORS
639 GREASE STABS (AUX. DRAWERS)

639 CLEAN OUT UNITS
639 TOUCH UP PAINT
639 WRAP PANS-SECURE SHUTTER & BARRIER
G-51 INSTALL REAR COVERS
NA INSTRUCTION BOOKS INSTALLED
NA DETAIL ITEMS CHECKED
NA "AS BUILT" DRAWINGS IN DETAIL BOX
NA CALIF. CODE
NA CSA/U.L. LABEL INSTALLED
NA ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY [Signature]DATE 7/23/96



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLESHOP ORDER: 7715
UNIT NUMBER: 8

LAYOUT PANELS:

- 1. CORRECT PANEL
- 2. DEVICES (LEVEL & CORRECT) }

I HAVE CHECKED

U 191
L 191

I HAVE CHECKED

FRONT MODULE:

- 1. MODULE ASSEMBLY }
- 2. TERMINAL BLOCKS }
- 3. LABEL T. BLOCKS }

191

WIRING OF PANELS:

- 1. WIRE SIZE
- 2. TERMINALS
- 3. WIRE MARKERS }

I HAVE CHECKED

U 813/828
L 191

I HAVE CHECKED

FRONT MODULE
SHIPPING GROUPS:

- 1. HINGE PANELS
- 2. TIE BOLT SHIPPING GROUP
- 3. SHORTAGES

191
191
191LOW VOLTAGE PANELS
AND FIXED PANELS:

- 1. CORRECT PANEL
- 2. DEVICE (LEVEL & CORRECT)
- 3. NAME PLATE (LEVEL & CORRECT)
- 4. WIRING (TERMINAL, WIRE MARKERS, & CRIMPS)
- 5. CROSS UNIT WIRING

I HAVE CHECKED

395
395
395
490
15 1/16

I HAVE CHECKED

FRONT MODULE
HOOKUP:

- 1. WIRING TERMINAL, WIRE SIZE, WIRE HINGE, WIRE MARKERS & CRIMPS }
- 2. T.B. (MARKING STRIPS) }
- 3. SHORTAGE (ID, WIRED, AND VERIFIED) }
- 4. JUMPERS
- 5. PANDUIT & COVERS
- 6. LOOSE CONNECTIONS
- 7. CLEAN OUT UNIT

191

INTERNALS

UPPER 808
LOWER 1A



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT

MV ASSEMBLY

1200AMP ☒ 2000AMP ☒ 3000AMP ☐
5KV ☒ 15KV ☐ 27KV ☐SHOP ORDER: 7715UNIT NUMBER: 8

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)
RUN DUMMY BREAKER
CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 6

308 TIE BOLT SHIPPING GROUPS
308 AUX. COMPARTMENT (CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
308 BREAKER COMPARTMENT (UPPER) (LOWER)
NA KEY INTERLOCKS (AUX. & BREAKER COMP.)
308 WIRING: (FRONT TO MID MODULE)
NA OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

308 MAIN BUS COMPARTMENT
308 UPPER COMPARTMENT
308 LOWER COMPARTMENT
308 INTERNAL & EXTERNAL DIMENSIONS
308 GEAR RELEASED TO TEST
W 6-100 ELECTRICAL TEST COMPLETE

FINAL PAINT
PREPARATION FOR SHIPMENT

I HAVE CHECKED:

NA PAINTER OF BATCH
NA CLEAN PAINT OVERSPRAY
639 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
NA RODENT PROOF
NA DUST PROOF
NA TAPE ARRESTORS
639 GREASE STABS (AUX. DRAWERS)

639 CLEAN OUT UNITS
639 TOUCH UP PAINT
639 WRAP PANS-SECURE SHUTTER & BARRIER
G-51 INSTALL REAR COVERS
NA INSTRUCTION BOOKS INSTALLED
NA DETAIL ITEMS CHECKED
NA "AS BUILT" DRAWINGS IN DETAIL BOX
NA CALIF. CODE
NA CSA/U.L. LABEL INSTALLED
NA ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY W 6-51DATE 7/23/96



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLESHOP ORDER: 7715
UNIT NUMBER: 9

I HAVE CHECKED

LAYOUT PANELS:

- 1. CORRECT PANEL
- 2. DEVICES (LEVEL & CORRECT) }

U 493
L 191

I HAVE CHECKED

FRONT MODULE:

- 1. MODULE ASSEMBLY
- 2. TERMINAL BLOCKS
- 3. LABEL T. BLOCKS }

504

I HAVE CHECKED

WIRING OF PANELS:

- 1. WIRE SIZE
- 2. TERMINALS
- 3. WIRE MARKERS }

U 146
L 411-682

I HAVE CHECKED

FRONT MODULE
SHIPPING GROUPS:

- 1. HINGE PANELS
- 2. TIE BOLT SHIPPING GROUP
- 3. SHORTAGES

526/643
526/643
526/643

I HAVE CHECKED

LOW VOLTAGE PANELS
AND FIXED PANELS:

- 1. CORRECT PANEL
- 2. DEVICE (LEVEL & CORRECT)
- 3. NAME PLATE (LEVEL & CORRECT)
- 4. WIRING (TERMINAL, WIRE MARKERS, & CRIMPS)
- 5. CROSS UNIT WIRING

395
395
395
490
164 + 166

I HAVE CHECKED

FRONT MODULE
HOOKUP:

- 1. WIRING TERMINAL, WIRE SIZE, WIRE HINGE, WIRE MARKERS & CRIMPS
- 2. T.B. (MARKING STRIPS)
- 3. SHORTAGE (ID, WIRED, AND VERIFIED)
- 4. JUMPERS
- 5. PANDUIT & COVERS
- 6. LOOSE CONNECTIONS
- 7. CLEAN OUT UNIT

526/643

INTERNALS

UPPER 146
LOWER 411

**Cutler-Hammer**

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☐ 2000AMP ☐ 3000AMP ☐
 5KV ☐ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 9**I HAVE CHECKED: (A-STATION)**599

MID MODULE ASSY.

MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)

RUN DUMMY BREAKER

CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)TEAM # 6308

TIE BOLT SHIPPING GROUPS

NA

AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)

308

BREAKER COMPARTMENT (UPPER) (LOWER)

NA

KEY INTERLOCKS (AUX. & BREAKER COMP.)

308

WIRING: (FRONT TO MID MODULE)

NA

OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)308

MAIN BUS COMPARTMENT

308

UPPER COMPARTMENT

308

LOWER COMPARTMENT

308

INTERNAL & EXTERNAL DIMENSIONS

308

GEAR RELEASED TO TEST

308

ELECTRICAL TEST COMPLETE

FINAL PAINT**PREPARATION FOR SHIPMENT****I HAVE CHECKED:**NA

PAINTER OF BATCH

NA

CLEAN PAINT OVERSPRAY

639

N.P.'S-DECALS-WARNING LABELS-MIMIC BUS

NA

RODENT PROOF

NA

DUST PROOF

NA

TAPE ARRESTORS

NA

GREASE STABS (AUX. DRAWERS)

639

CLEAN OUT UNITS

639

TOUCH UP PAINT

639

WRAP PANS-SECURE SHUTTER & BARRIER

639

INSTALL REAR COVERS

NA

INSTRUCTION BOOKS INSTALLED

NA

DETAIL ITEMS CHECKED

NA

"AS BUILT" DRAWINGS IN DETAIL BOX

NA

CALIF. CODE

NA

CSA/U.L. LABEL INSTALLED

NA

ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY 7/23/96

DATE

W
G-57



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLE

SHOP ORDER: 7715
UNIT NUMBER: 10

LAYOUT PANELS:

1. CORRECT PANEL
2. DEVICES (LEVEL & CORRECT) }

I HAVE CHECKED

U 191
L 497

FRONT MODULE:

1. MODULE ASSEMBLY
2. TERMINAL BLOCKS
3. LABEL T. BLOCKS }

I HAVE CHECKED

809

WIRING OF PANELS:

1. WIRE SIZE
2. TERMINALS
3. WIRE MARKERS }

I HAVE CHECKED

U 192
L 813-328

FRONT MODULE
SHIPPING GROUPS:

1. HINGE PANELS
2. TIE BOLT SHIPPING GROUP
3. SHORTAGES

I HAVE CHECKED

688
688
688

LOW VOLTAGE PANELS
AND FIXED PANELS:

1. CORRECT PANEL
2. DEVICE (LEVEL & CORRECT)
3. NAME PLATE (LEVEL & CORRECT)
4. WIRING (TERMINAL, WIRE MARKERS,
& CRIMPS)
5. CROSS UNIT WIRING

I HAVE CHECKED

395
395
395
490
1614/162

FRONT MODULE
HOOKUP:

1. WIRING TERMINAL, WIRE
SIZE, WIRE HINGE, WIRE
MARKERS & CRIMPS
2. T.B. (MARKING STRIPS)
3. SHORTAGE (ID, WIRED,
AND VERIFIED)
4. JUMPERS
5. PANDUIT & COVERS
6. LOOSE CONNECTIONS
7. CLEAN OUT UNIT

I HAVE CHECKED

-688

INTERNALS

UPPER 192
LOWER 813-328



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

 1200AMP ☒ 2000AMP ☐ 3000AMP ☐
 5KV ☒ 15KV ☐ 27KV ☐
SHOP ORDER: 7715UNIT NUMBER: 10

I HAVE CHECKED: (A-STATION)

579 MID MODULE ASSY.
 MAIN CONTACT ASSY (GLASS-POLYESTER-PORCELAIN-EPOXY)
 RUN DUMMY BREAKER
 CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 6

308/ TIE BOLT SHIPPING GROUPS
NA AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
308/ BREAKER COMPARTMENT (UPPER) (LOWER)
NA KEY INTERLOCKS (AUX. & BREAKER COMP.)
308/ WIRING: (FRONT TO MID MODULE)
NA OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

308/ MAIN BUS COMPARTMENT
308/ UPPER COMPARTMENT
308/ LOWER COMPARTMENT
308/ INTERNAL & EXTERNAL DIMENSIONS
308 GEAR RELEASED TO TEST

G-100 ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

NA PAINTER OF BATCH
NA CLEAN PAINT OVERSPRAY
639 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
NA RODENT PROOF
NA DUST PROOF
NA TAPE ARRESTORS
NA GREASE STABS (AUX. DRAWERS)

639 CLEAN OUT UNITS
639 TOUCH UP PAINT
639 WRAP PANS-SECURE SHUTTER & BARRIER
G-51 INSTALL REAR COVERS
NA INSTRUCTION BOOKS INSTALLED
NA DETAIL ITEMS CHECKED
NA "AS BUILT" DRAWINGS IN DETAIL BOX
NA CALIF. CODE
NA CSA/U.I. LABEL INSTALLED
NA ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY [Signature]DATE: 7/23/96



Cutler-Hammer

HNF-SD-CP-ATR-089, REV. 0

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Greenwood, S.C.

QUALITY CHECK SHEET
GREENWOOD PLANT
CONTROL CUBICLE

SHOP ORDER: 7715

UNIT NUMBER: 11

I HAVE CHECKED

LAYOUT PANELS:

1. CORRECT PANEL

2. DEVICES (LEVEL & CORRECT) }

U 493
L 493

FRONT MODULE:

1. MODULE ASSEMBLY

2. TERMINAL BLOCKS

3. LABEL T. BLOCKS

I HAVE CHECKED

504

I HAVE CHECKED

WIRING OF PANELS:

1. WIRE SIZE

2. TERMINALS

3. WIRE MARKERS }

U 644
L 146-206

FRONT MODULE

SHIPPING GROUPS:

1. HINGE PANELS

2. TIE BOLT SHIPPING GROUP

3. SHORTAGES

I HAVE CHECKED

643

643

643

I HAVE CHECKED

LOW VOLTAGE PANELS
AND FIXED PANELS:

1. CORRECT PANEL

2. DEVICE (LEVEL & CORRECT)

3. NAME PLATE (LEVEL & CORRECT)

4. WIRING (TERMINAL, WIRE MARKERS,
& CRIMPS)

5. CROSS UNIT WIRING

395

395

395

490

164 + 166

FRONT MODULE

HOOKUP:

1. WIRING TERMINAL, WIRE
SIZE, WIRE HINGE, WIRE
MARKERS & CRIMPS

2. T.B. (MARKING STRIPS)

3. SHORTAGE (ID, WIRED,
AND VERIFIED)

4. JUMPERS

5. PANDUIT & COVERS

6. LOOSE CONNECTIONS

7. CLEAN OUT UNIT

I HAVE CHECKED

643

INTERNALS

UPPER

LOWER

644

206



Cutler-Hammer

Greenwood, S.C.

QUALITY CHECK SHEET

GREENWOOD PLANT

MV ASSEMBLY

1200AMP ☐ 2000AMP ☐ 3000AMP ☐
5KV ☒ 15KV ☐ 27KV ☐SHOP ORDER: 7715UNIT NUMBER: 11

I HAVE CHECKED: (A-STATION)

599 MID MODULE ASSY.
MAIN CONTACT ASSY. (GLASS POLYESTER-PORCELAIN-EPOXY)
RUN DUMMY BREAKER
CT'S RATIO AND STYLE NUMBER

I HAVE CHECKED: (MID MODULE FRONT)

TEAM # 6

N/A TIE BOLT SHIPPING GROUPS
N/A AUX. COMPARTMENT (PT-CPT-FUSE) (U1-U2-L1-L2) (L.A.-CAP.)
639 BREAKER COMPARTMENT (UPPER) (LOWER)
N/A KEY INTERLOCKS (AUX. & BREAKER COMP.)
639 WIRING: (FRONT TO MID MODULE)
N/A OUTDOOR ASSEMBLY COMPLETE

I HAVE CHECKED: (REAR MODULE)

16 MAIN BUS COMPARTMENT
181 UPPER COMPARTMENT
181 LOWER COMPARTMENT
181 INTERNAL & EXTERNAL DIMENSIONS
181 GEAR RELEASED TO TEST
____ ELECTRICAL TEST COMPLETE

FINAL PAINT

PREPARATION FOR SHIPMENT

I HAVE CHECKED:

N/A PAINTER OF BATCH
N/A CLEAN PAINT OVERSPRAY
639 N.P.'S-DECALS-WARNING LABELS-MIMIC BUS
N/A RODENT PROOF
N/A DUST PROOF
N/A TAPE ARRESTORS
N/A GREASE STABS (AUX. DRAWERS)

639 CLEAN OUT UNITS
639 TOUCH UP PAINT
639 WRAP PANS-SECURE SHUTTER & BARRIER
639 INSTALL REAR COVERS
N/A INSTRUCTION BOOKS INSTALLED
N/A DETAIL ITEMS CHECKED
N/A "AS BUILT" DRAWINGS IN DETAIL BOX
N/A CALIF. CODE
N/A CSA/U.L. LABEL INSTALLED
N/A ALL C/N COMPLETE

ASSEMBLY RELEASED FOR SHIPMENT

APPROVED BY [Signature]DATE 7/23/96

SECTION 4B

MAIN SUBSTATION 5 KV VACUUM BREAKER FACTORY TEST RESULT

- A. NAMEPLATE & COMPONENT VERIFICATION
- B. MECHANICAL OPERATION AND TOLERANCES
- C. ELECTRICAL OPERATION AND TOLERANCES
- D. WIRING & TERMINATIONS
- E. LUBRICATION AND CLEANLINESS
- F. RESISTANCE OF CONTACTS
- G. DIELECTRIC TESTS OF WIRING & VACUUM BOTTLES

THANK YOU FOR CHOOSING CUTLER-HAMMER
WE TAKE GREAT PRIDE IN THE
QUALITY OF THE CIRCUIT BREAKER
WE HAVE BUILT FOR YOU

FOR SERVICE OF THIS PRODUCTS,
PLEASE CONTACT YOUR LOCAL
CUTLER-HAMMER SALES REPRESENTATIVE

CERTIFIED
PRODUCTION TEST REPORT
DO NOT DISCARD
GIVE TO MAINTENANCE SUPERVISOR



CUTLER-HAMMER

WESTINGHOUSE PRODUCTS

EATON

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>SD VCPW 350</u> - <u>1900</u> Amp.	Serial No. <u>96076451</u>
<u>6616040811</u>	V. I. Serial No's.
Style No.	Pole 1 <u>9602617341</u>
<u>20240307010000000000</u>	Pole 2 <u>2605641269</u>
Order No.	Pole 3 <u>2603634693</u>

No. TEST DESCRIPTION

✓ = OKAY

- | | | | |
|---|--------------|-----|----|
| 1. Nameplate / Component Verification | <u>99957</u> | ✓ | 1 |
| 2. Initial operations counter reading | | ✓ | 2 |
| 3. Control wiring continuity | | ✓ | 3 |
| 4. Control wiring insulation 1800V 1 sec., motor 900V 1 min. | | ✓ | 4 |
| 5. W-vac only, control wiring insulation and motor 2,000V 1 min. | | N/A | 5 |
| 6. Slow manual charge | | ✓ | 6 |
| 7. Holding pawl stop adjustment | | ✓ | 7 |
| 8. Latch check switch function | | ✓ | 8 |
| 9. Auxiliary switch assembly and operation | | ✓ | 9 |
| 10. Operation at Min., Max, & Rated control voltage | | ✓ | 10 |
| 11. Shunt Trip #2 Min., Max., & Rated control voltage | | N/A | 11 |
| 12. Anti-pump and electric trip-free | | ✓ | 12 |
| 13. Closing spring charging time < 7 seconds | | ✓ | 13 |
| 14. Position switch function | | ✓ | 14 |
| 15. Shunt trip sneak | | ✓ | 15 |
| 16. Manual trip release; Manual close release | | ✓ | 16 |
| 17. Spring anti-discharge interlock | | ✓ | 17 |
| 18. UV trip operation | | N/A | 18 |
| 19. Contact wipe | | ✓ | 19 |
| 20. Contact resistance - micro-Ohms @ 100 Amperes dc | | ✓ | 20 |
| Pole # 1 <u>11</u> Pole # 2 <u>11</u> Pole # 3 <u>11</u> | | | |
| Time parameters - milliseconds | | | |
| 21. Closing: Pole # 1 <u>48.9</u> Pole # 2 <u>49.3</u> Pole # 3 <u>48.8</u> | | ✓ | 21 |
| 22. Opening ST1: Pole # 1 <u>34.8</u> Pole # 2 <u>34.5</u> Pole # 3 <u>35.0</u> | | ✓ | 22 |
| Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____ | | N/A | 22 |
| 23. Low frequency withstand 19/27/38/60 KV 1 minute | | ✓ | 23 |
| 24. Vacuum integrity withstand 27/38/60 KV 1 minute | | ✓ | 24 |

No. INSPECTION DESCRIPTION

✓ = OKAY

- | | | |
|--|--------------|----|
| 26 Primary disconnect contact alignment | ✓ | 26 |
| 27 Position interlocks function | ✓ | 27 |
| 28 Mechanism interlocks function | ✓ | 28 |
| 29 Ground contact engagement | ✓ | 29 |
| 30 Floor tripper operation | ✓ | 30 |
| 31 Coding plate verification | ✓ | 31 |
| 32 Correct barriers, properly installed | ✓ | 32 |
| 33 Correct front panel | ✓ | 33 |
| 34 Correct escutcheon plate | ✓ | 34 |
| 35 Correct primary disconnect contacts | ✓ | 35 |
| 36 CLOSED/OPEN and CHARGED/Discharged indicators | ✓ | 36 |
| 37 PUSH TO OPEN and PUSH TO CLOSE labels | ✓ | 37 |
| 38 Hardware correct, tight and none missing | ✓ | 38 |
| 39 Breaker marked for ✓ Test and ✓ Jig complete | ✓ | 39 |
| 40 Lubricated per Drawing 8297A57 Sheet 1 and 2 | ✓ | 40 |
| 41 Final * operations counter reading | | 41 |
| 42 General appearance and cleanliness | <u>00018</u> | 42 |
| 43 All tests and inspections marked OK or N/A | ✓ | 43 |

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester [Signature] Date 7/11/96 Inspector [Signature] Date 7/12/96

NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>50 VEPW 350</u> - <u>1200</u> Amp.	Serial No. <u>96076452</u>
<u>11110040211</u>	V. I. Serial No's.
Style No.	Pole 1 <u>9602623493</u>
<u>0229030701100000000000</u>	Pole 2 <u>9602630866</u>
Option No.	Pole 3 <u>9603634147</u>

No. TEST DESCRIPTION	✓ = OKAY
1. Nameplate / Component Verification	✓ 1
2. Initial operations counter reading <u>99452</u>	✓ 2
3. Control wiring continuity	✓ 3
4. Control wiring insulation 1800V 1 sec., motor 900V 1 min.	✓ 4
5. W-vac only, control wiring insulation and motor 2,000V 1 min.	N/A 5
6. Slow manual charge	✓ 6
7. Holding pawl stop adjustment	✓ 7
8. Latch check switch function	✓ 8
9. Auxiliary switch assembly and operation	✓ 9
10. Operation at Min., Max, & Rated control voltage	✓ 10
11. Shunt Trip #2 Min., Max., & Rated control voltage	N/A 11
12. Anti-pump and electric trip-free	✓ 12
13. Closing spring charging time < 7 seconds	✓ 13
14. Position switch function	✓ 14
15. Shunt trip sneak	✓ 15
16. Manual trip release; Manual close release	✓ 16
17. Spring anti-discharge interlock	✓ 17
18. UV trip operation	N/A 18
19. Contact wipe	✓ 19
20. Contact resistance - micro-Ohms @ 100 Amperes dc Pole # 1 <u>10</u> Pole # 2 <u>11</u> Pole # 3 <u>11</u>	✓ 20
Time parameters - milliseconds	
21. Closing: Pole # 1 <u>46.1</u> Pole # 2 <u>49.4</u> Pole # 3 <u>49.4</u>	✓ 21
22. Opening ST1: Pole # 1 <u>34.2</u> Pole # 2 <u>34.0</u> Pole # 3 <u>34.5</u>	✓ 22
Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____	N/A 22
23. Low frequency withstand 19/27/38/60 KV 1 minute	✓ 23
24. Vacuum integrity withstand 19/27/38/60 KV 1 minute	✓ 24

No. INSPECTION DESCRIPTION	✓ = OKAY
26 Primary disconnect contact alignment	✓ 26
27 Position interlocks function	✓ 27
28 Mechanism interlocks function	✓ 28
29 Ground contact engagement	✓ 29
30 Floor tripper operation	✓ 30
31 Coding plate verification	✓ 31
32 Correct barriers, properly installed	✓ 32
33 Correct front panel	✓ 33
34 Correct escutcheon plate	✓ 34
35 Correct primary disconnect contacts	✓ 35
36 CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37 PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38 Hardware correct, tight and none missing	✓ 38
39 Breaker marked for <u>✓</u> Test and <u>✓</u> Jig complete	✓ 39
40 Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41 Final * operations counter reading <u>00023</u>	✓ 41
42 General appearance and cleanliness	✓ 42
43 All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester <u>[Signature]</u>	Date <u>7/1/96</u>	Inspector <u>[Signature]</u>	Date <u>7/2/96</u>
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*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>50 (6P4) 350</u> - <u>1000</u> Amp.	Serial No. <u>96076453</u>
<u>6676340011</u>	V. I. Serial No's.
Style No.	Pole 1 <u>9603634738</u>
<u>20240307010000000000</u>	Pole 2 <u>9603634219</u>
Option No.	Pole 3 <u>9603628842</u>

No. TEST DESCRIPTION**✓ = OKAY**

- | | | | |
|---|--------------|-------------------------------------|----|
| 1. Nameplate / Component Verification | <u>99254</u> | ☒ | 1 |
| 2. Initial operations counter reading | | ☒ | 2 |
| 3. Control wiring continuity | | ☒ | 3 |
| 4. Control wiring insulation 1800V 1 sec., motor 900V 1 min. | | ☒ | 4 |
| 5. W-vac only, control wiring insulation and motor 2,000V 1 min. | | <u>N/A</u> | 5 |
| 6. Slow manual charge | | ☒ | 6 |
| 7. Holding pawl stop adjustment | | ☒ | 7 |
| 8. Latch check switch function | | ☒ | 8 |
| 9. Auxiliary switch assembly and operation | | ☒ | 9 |
| 10. Operation at Min., Max., & Rated control voltage | | ☒ | 10 |
| 11. Shunt Trip #2 Min., Max., & Rated control voltage | | <u>N/A</u> | 11 |
| 12. Anti-pump and electric trip-free | | ☒ | 12 |
| 13. Closing spring charging time < 7 seconds | | ☒ | 13 |
| 14. Position switch function | | ☒ | 14 |
| 15. Shunt trip sneak | | ☒ | 15 |
| 16. Manual trip release; Manual close release | | ☒ | 16 |
| 17. Spring anti-discharge interlock | | ☒ | 17 |
| 18. UV trip operation | | <u>N/A</u> | 18 |
| 19. Contact wipe | | ☒ | 19 |
| 20. Contact resistance - micro-Ohms @ 100 Amperes dc | | ☒ | |
| Pole # 1 <u>11</u> Pole # 2 <u>11</u> Pole # 3 <u>11</u> | | ☒ | 20 |
| Time parameters - milliseconds | | ☒ | |
| 21. Closing: Pole # 1 <u>423</u> Pole # 2 <u>496</u> Pole # 3 <u>491</u> | | ☒ | 21 |
| 22. Opening ST1: Pole # 1 <u>341</u> Pole # 2 <u>2338</u> Pole # 3 <u>342</u> | | ☒ | 22 |
| Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____ | | <u>N/A</u> | 22 |
| 23. Low frequency withstand 19/27(38)60 KV 1 minute | | ☒ | 23 |
| 24. Vacuum integrity withstand 27(38)60 KV 1 minute | | ☒ | 24 |

No. INSPECTION DESCRIPTION**✓ = OKAY**

- | | | |
|--|-------------------------------------|----|
| 26. Primary disconnect contact alignment | ☒ | 26 |
| 27. Position interlocks function | ☒ | 27 |
| 28. Mechanism interlocks function | ☒ | 28 |
| 29. Ground contact engagement | ☒ | 29 |
| 30. Floor tripper operation | ☒ | 30 |
| 31. Coding plate verification | ☒ | 31 |
| 32. Correct barriers, properly installed | ☒ | 32 |
| 33. Correct front panel | ☒ | 33 |
| 34. Correct escutcheon plate | ☒ | 34 |
| 35. Correct primary disconnect contacts | ☒ | 35 |
| 36. CLOSED/OPEN and CHARGED/Discharged indicators | ☒ | 36 |
| 37. PUSH TO OPEN and PUSH TO CLOSE labels | ☒ | 37 |
| 38. Hardware correct, tight and none missing | ☒ | 38 |
| 39. Breaker marked for ☒ Test and ☒ Jig complete | ☒ | 39 |
| 40. Lubricated per Drawing <u>8297A5Z</u> Sheet 1 and 2 | ☒ | 40 |
| 41. Final * operations counter reading | | 41 |
| 42. General appearance and cleanliness | <u>00013</u> | 42 |
| 43. All tests and inspections marked OK or N/A | ☒ | 43 |

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester

Date

Inspector

Date

NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type	<u>50VCPW 350</u>	-	<u>1200</u>	Amp.	Serial No. <u>96076454</u>
Style No.	<u>2216C40G11</u>	V. I. Serial No's.			
Option No.	<u>22290307010000000000</u>	Pole 1 <u>9605G44390</u>			
		Pole 2 <u>9603G34736</u>			
		Pole 3 <u>9603G30867</u>			

No.	TEST DESCRIPTION	✓ = OKAY
1.	Nameplate / Component Verification	✓ 1
2.	Initial operations counter reading <u>99951</u>	✓ 2
3.	Control wiring continuity	✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.	✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	N/A 5
6.	Slow manual charge	✓ 6
7.	Holding pawl stop adjustment	✓ 7
8.	Latch check switch function	✓ 8
9.	Auxiliary switch assembly and operation	✓ 9
10.	Operation at Min., Max., & Rated control voltage	✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	N/A 11
12.	Anti-pump and electric trip-free	✓ 12
13.	Closing spring charging time < 7 seconds	✓ 13
14.	Position switch function	✓ 14
15.	Shunt trip sneak	✓ 15
16.	Manual trip release; Manual close release	✓ 16
17.	Spring anti-discharge interlock	✓ 17
18.	UV trip operation	N/A 18
19.	Contact wipe	✓ 19
20.	Contact resistance - micro-Ohms @ 100 Amperes dc Pole # 1 <u>10</u> Pole # 2 <u>10</u> Pole # 3 <u>10</u>	✓ 20
	Time parameters - milliseconds	
21.	Closing: Pole # 1 <u>48.9</u> Pole # 2 <u>48.6</u> Pole # 3 <u>49.1</u>	✓ 21
22.	Opening ST1: Pole # 1 <u>34.7</u> Pole # 2 <u>34.1</u> Pole # 3 <u>34.5</u>	✓ 22
	Opening ST2: Pole # 1 Pole # 2 Pole # 3	N/A 22
23.	Low frequency withstand 19/27/60 KV 1 minute	✓ 23
24.	Vacuum integrity withstand 27/60 KV 1 minute	✓ 24

No.	INSPECTION DESCRIPTION	✓ = OKAY
26.	Primary disconnect contact alignment	✓ 26
27.	Position interlocks function	✓ 27
28.	Mechanism interlocks function	✓ 28
29.	Ground contact engagement	✓ 29
30.	Floor tripper operation	✓ 30
31.	Coding plate verification	✓ 31
32.	Correct barriers, properly installed	✓ 32
33.	Correct front panel	✓ 33
34.	Correct escutcheon plate	✓ 34
35.	Correct primary disconnect contacts	✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38.	Hardware correct, tight and none missing	✓ 38
39.	Breaker marked for ✓ Test and ✓ Jig complete	✓ 39
40.	Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41.	Final * operations counter reading	✓ 41
42.	General appearance and cleanliness <u>00022</u>	✓ 42
43.	All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester Paul Poliquin Date 7/2/96 Inspector William L. L... Date 7/2/96

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type SD UCDW 350 - 1200 Amp. Serial No. 76076455
Style No. 616040A11 V. I. Serial No's.
20240307010000000000 Pole 1 19605642481
Pole 2 29603629136
Option No. Pole 3 37603632427

No. TEST DESCRIPTION ✓ = OKAY

1. Nameplate / Component Verification ✓ 1
2. Initial operations counter reading 99953 ✓ 2
3. Control wiring continuity ✓ 3
4. Control wiring insulation 1800V 1 sec., motor 900V 1 min. ✓ 4
5. W-vac only, control wiring insulation and motor 2,000V 1 min. N/A 5
6. Slow manual charge ✓ 6
7. Holding pawl stop adjustment ✓ 7
8. Latch check switch function ✓ 8
9. Auxiliary switch assembly and operation ✓ 9
10. Operation at Min., Max., & Rated control voltage ✓ 10
11. Shunt Trip #2 Min., Max., & Rated control voltage N/A 11
12. Anti-pump and electric trip-free ✓ 12
13. Closing spring charging time < 7 seconds ✓ 13
14. Position switch function ✓ 14
15. Shunt trip sneak ✓ 15
16. Manual trip release; Manual close release ✓ 16
17. Spring anti-discharge interlock ✓ 17
18. UV trip operation N/A 18
19. Contact wipe ✓ 19
20. Contact resistance - micro-Ohms@ 100 Amperes dc
Pole # 1 11 Pole # 2 11 Pole # 3 10 ✓ 20
- Time parameters - milliseconds
21. Closing: Pole # 1 495 Pole # 2 492 Pole # 3 500 ✓ 21
22. Opening ST1: Pole # 1 341 Pole # 2 338 Pole # 3 341 ✓ 22
- Opening ST2: Pole # 1 Pole # 2 Pole # 3 N/A 22
23. Low frequency withstand 19/27/33/60 KV 1 minute ✓ 23
24. Vacuum integrity withstand 27/33/60 KV 1 minute ✓ 24

No. INSPECTION DESCRIPTION ✓ = OKAY

- 26 Primary disconnect contact alignment ✓ 26
- 27 Position interlocks function ✓ 27
- 28 Mechanism interlocks function ✓ 28
- 29 Ground contact engagement ✓ 29
- 30 Floor tripper operation ✓ 30
- 31 Coding plate verification ✓ 31
- 32 Correct barriers, properly installed ✓ 32
- 33 Correct front panel ✓ 33
- 34 Correct escutcheon plate ✓ 34
- 35 Correct primary disconnect contacts ✓ 35
- 36 CLOSED/OPEN and CHARGED/Discharged indicators ✓ 36
- 37 PUSH TO OPEN and PUSH TO CLOSE labels ✓ 37
- 38 Hardware correct, tight and none missing ✓ 38
- 39 Breaker marked for ✓ Test and ✓ Jig complete ✓ 39
- 40 Lubricated per Drawing 8297A57 Sheet 1 and 2 ✓ 40
- 41 Final * operations counter reading 00023 ✓ 41
- 42 General appearance and cleanliness ✓ 42
- 43 All tests and inspections marked OK or N/A ✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester [Signature] Date 7/2/96 Inspector [Signature] Date 7/2/96

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>50CPW 350</u> - <u>1200</u> Amp.		Serial No. <u>96076484</u>
<u>6611200011</u>		V. I. Serial No's.
Style No.		Pole 1 <u>9604635091</u>
<u>0202403070100000000000</u>		Pole 2 <u>9604636356</u>
Option No.		Pole 3 <u>9604638019</u>

No. TEST DESCRIPTION	✓ = OKAY
1. Nameplate / Component Verification	✓ 1
2. Initial operations counter reading <u>99959</u>	✓ 2
3. Control wiring continuity	✓ 3
4. Control wiring insulation 1800V 1 sec., motor 900V 1 min.	✓ 4
5. W-vac only, control wiring insulation and motor 2,000V 1 min.	N/A 5
6. Slow manual charge	✓ 6
7. Holding pawl stop adjustment	✓ 7
8. Latch check switch function	✓ 8
9. Auxiliary switch assembly and operation	✓ 9
10. Operation at Min., Max., & Rated control voltage	✓ 10
11. Shunt Trip #2 Min., Max., & Rated control voltage	N/A 11
12. Anti-pump and electric trip-free	✓ 12
13. Closing spring charging time < 7 seconds	✓ 13
14. Position switch function	✓ 14
15. Shunt trip sneak	✓ 15
16. Manual trip release; Manual close release	✓ 16
17. Spring anti-discharge interlock	✓ 17
18. UV trip operation	N/A 18
19. Contact wipe	✓ 19
20. Contact resistance - micro-Ohms @ 100 Amperes dc	
Pole # 1 <u>11</u> Pole # 2 <u>11</u> Pole # 3 <u>11</u>	✓ 20
Time parameters - milliseconds	
21. Closing: Pole # 1 <u>50.5</u> Pole # 2 <u>50.5</u> Pole # 3 <u>49.6</u>	✓ 21
22. Opening ST1: Pole # 1 <u>34.7</u> Pole # 2 <u>23.8</u> Pole # 3 <u>34.6</u>	✓ 22
Opening ST2: Pole # 1 Pole # 2 Pole # 3	N/A 22
23. Low frequency withstand 19/27/60 KV 1 minute	✓ 23
24. Vacuum integrity withstand 27/60 KV 1 minute	✓ 24

No. INSPECTION DESCRIPTION	✓ = OKAY
26 Primary disconnect contact alignment	✓ 26
27 Position interlocks function	✓ 27
28 Mechanism interlocks function	✓ 28
29 Ground contact engagement	✓ 29
30 Floor tripper operation	✓ 30
31 Coding plate verification	✓ 31
32 Correct barriers, properly installed	✓ 32
33 Correct front panel	✓ 33
34 Correct escutcheon plate	✓ 34
35 Correct primary disconnect contacts	✓ 35
36 CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37 PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38 Hardware correct, tight and none missing	✓ 38
39 Breaker marked for ✓ Test and ✓ Jig complete	✓ 39
40 Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41 Final * operations counter reading	✓ 41
42 General appearance and cleanliness <u>00033</u>	✓ 42
43 All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester Paul Freigang Date 7/10/96 Inspector William Thomas Date 7/10/96

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>50VCPW 350</u> - <u>1200</u> Amp.	Serial No. <u>96076485</u>
<u>144100400111</u>	V. I. Serial No.'s.
Style No.	Pole 1 <u>2603634146</u>
<u>20240307010000000000</u>	Pole 2 <u>2604536361</u>
Option No.	Pole 3 <u>2602923897</u>

No. TEST DESCRIPTION		J = OKAY
1. Nameplate / Component Verification	<u>99955</u>	☒ 1
2. Initial operations counter reading		☒ 2
3. Control wiring continuity		☒ 3
4. Control wiring insulation 1800V 1 sec., motor 900V 1 min.		☒ 4
5. W-vac only, control wiring insulation and motor 2,000V 1 min.		☒ 5
6. Slow manual charge		☒ 6
7. Holding pawl stop adjustment		☒ 7
8. Latch check switch function		☒ 8
9. Auxiliary switch assembly and operation		☒ 9
10. Operation at Min., Max., & Rated control voltage		☒ 10
11. Shunt Trip #2 Min., Max., & Rated control voltage		☒ 11
12. Anti-pump and electric trip-free		☒ 12
13. Closing spring charging time < 7 seconds		☒ 13
14. Position switch function		☒ 14
15. Shunt trip sneak		☒ 15
16. Manual trip release; Manual close release		☒ 16
17. Spring anti-discharge interlock		☒ 17
18. UV trip operation		☒ 18
19. Contact wipe		☒ 19
20. Contact resistance - micro-Ohms @ 100 Amperes dc		☒ 20
Pole # 1 <u>11</u> Pole # 2 <u>12</u> Pole # 3 <u>12</u>		
Time parameters - milliseconds		
21. Closing: Pole # 1 <u>48.2</u> Pole # 2 <u>48.9</u> Pole # 3 <u>49.4</u>		☒ 21
22. Opening ST1: Pole # 1 <u>33.4</u> Pole # 2 <u>23.6</u> Pole # 3 <u>32.9</u>		☒ 22
Opening ST2: Pole # 1 <u> </u> Pole # 2 <u> </u> Pole # 3 <u> </u>		☒ 22
23. Low frequency withstand 19/27/60 KV 1 minute		☒ 23
24. Vacuum integrity withstand 27/60/60 KV 1 minute		☒ 24

No. INSPECTION DESCRIPTION		J = OKAY
26 Primary disconnect contact alignment		☒ 26
27 Position interlocks function		☒ 27
28 Mechanism interlocks function		☒ 28
29 Ground contact engagement		☒ 29
30 Floor tripper operation		☒ 30
31 Coding plate verification		☒ 31
32 Correct barriers, properly installed		☒ 32
33 Correct front panel		☒ 33
34 Correct escutcheon plate		☒ 34
35 Correct primary disconnect contacts		☒ 35
36 CLOSED/OPEN and CHARGED/Discharged indicators		☒ 36
37 PUSH TO OPEN and PUSH TO CLOSE labels		☒ 37
38 Hardware correct, tight and none missing		☒ 38
39 Breaker marked for ☒ Test and ☒ Jig complete		☒ 39
40 Lubricated per Drawing <u>8297A57</u> Sheet 1 and 2		☒ 40
41 Final * operations counter reading		☒ 41
42 General appearance and cleanliness	<u>00026</u>	☒ 42
43 All tests and inspections marked OK or N/A		☒ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester Randy R. [Signature] Date 7/10/96 Inspector [Signature] Date 7/10/96

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type	50 VCPW 750	--	1200	Amp.	Serial No.	26076486	
					V. I. Serial No's.		
						Style No.	
2607648611						Pole 1	2604634698
20290307010000000000						Pole 2	2604634008
Option No.						Pole 3	2602934144

No.	TEST DESCRIPTION	I = OKAY
1.	Nameplate / Component Verification	✓ 1
2.	Initial operations counter reading	99952 ✓ 2
3.	Control wiring continuity	✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.	✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	N/A 5
6.	Slow manual charge	✓ 6
7.	Holding pawl stop adjustment	✓ 7
8.	Latch check switch function	✓ 8
9.	Auxiliary switch assembly and operation	✓ 9
10.	Operation at Min., Max., & Rated control voltage	✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	N/A 11
12.	Anti-pump and electric trip-free	✓ 12
13.	Closing spring charging time < 7 seconds	✓ 13
14.	Position switch function	✓ 14
15.	Shunt trip sneak	✓ 15
16.	Manual trip release; Manual close release	✓ 16
17.	Spring anti-discharge interlock	✓ 17
18.	UV trip operation	N/A 18
19.	Contact wipe	✓ 19
20.	Contact resistance - micro-Ohms@ 100 Amperes dc	
	Pole # 1 11 Pole # 2 11 Pole # 3 10	✓ 20
	Time parameters - milliseconds	
21.	Closing: Pole # 1 50.6 Pole # 2 50.2 Pole # 3 50.2	✓ 21
22.	Opening ST1: Pole # 1 34.9 Pole # 2 34.1 Pole # 3 34.1	✓ 22
	Opening ST2: Pole # 1 Pole # 2 Pole # 3	N/A 22
23.	Low frequency withstand 19/27/38/60 KV 1 minute	✓ 23
24.	Vacuum integrity withstand 27/38/60 KV 1 minute	✓ 24

No.	INSPECTION DESCRIPTION	I = OKAY
26.	Primary disconnect contact alignment	✓ 26
27.	Position interlocks function	✓ 27
28.	Mechanism interlocks function	✓ 28
29.	Ground contact engagement	✓ 29
30.	Floor tripper operation	✓ 30
31.	Coding plate verification	✓ 31
32.	Correct barriers, properly installed	✓ 32
33.	Correct front panel	✓ 33
34.	Correct escutcheon plate	✓ 34
35.	Correct primary disconnect contacts	✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38.	Hardware correct, tight and none missing	✓ 38
39.	Breaker marked for ✓ Test and ✓ Jig complete	✓ 39
40.	Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41.	Final * operations counter reading	✓ 41
42.	General appearance and cleanliness	90013 ✓ 42
43.	All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester	7/10/96	Inspector	7/10/96
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*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type 50MCPW 350 - 1220 Amp. Serial No. 96076489
0016040211 V. I. Serial No's.
 Style No. Pole 1 9604623496
002401307010000000000000 Pole 2 9604623622
 Option No. Pole 3 9603534422

No.	TEST DESCRIPTION		✓ = OKAY
1.	Nameplate / Component Verification	<u>99952</u>	✓ 1
2.	Initial operations counter reading		✓ 2
3.	Control wiring continuity		✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.		✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	<u>u/a</u>	✓ 5
6.	Slow manual charge		✓ 6
7.	Holding pawl stop adjustment		✓ 7
8.	Latch check switch function		✓ 8
9.	Auxiliary switch assembly and operation		✓ 9
10.	Operation at Min., Max. & Rated control voltage		✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	<u>u/a</u>	✓ 11
12.	Anti-pump and electric trip-free		✓ 12
13.	Closing spring charging time < 7 seconds		✓ 13
14.	Position switch function		✓ 14
15.	Shunt trip sneak		✓ 15
16.	Manual trip release; Manual close release		✓ 16
17.	Spring anti-discharge interlock		✓ 17
18.	UV trip operation	<u>u/a</u>	✓ 18
19.	Contact wipe		✓ 19
20.	Contact resistance - micro-Ohms@ 100 Amperes dc		
	Pole # 1 <u>12</u> Pole # 2 <u>13</u> Pole # 3 <u>12</u>		✓ 20
	Time parameters - milliseconds		
21.	Closing: Pole # 1 <u>51.2</u> Pole # 2 <u>51.8</u> Pole # 3 <u>51.9</u>		✓ 21
22.	Opening ST1: Pole # 1 <u>34.1</u> Pole # 2 <u>33.3</u> Pole # 3 <u>34.4</u>		✓ 22
	Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____		<u>u/a</u> 22
23.	Low frequency withstand 19/27/38/60 KV 1 minute		✓ 23
24.	Vacuum integrity withstand 27/38/60 KV 1 minute		✓ 24

No.	INSPECTION DESCRIPTION		✓ = OKAY
26.	Primary disconnect contact alignment		✓ 26
27.	Position interlocks function		✓ 27
28.	Mechanism interlocks function		✓ 28
29.	Ground contact engagement		✓ 29
30.	Floor tripper operation		✓ 30
31.	Coding plate verification		✓ 31
32.	Correct barriers, properly installed		✓ 32
33.	Correct front panel		✓ 33
34.	Correct escutcheon plate		✓ 34
35.	Correct primary disconnect contacts		✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators		✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels		✓ 37
38.	Hardware correct, tight and none missing		✓ 38
39.	Breaker marked for <u>✓</u> Test and <u>✓</u> Jig complete		✓ 39
40.	Lubricated per Drawing <u>8297A57</u> Sheet 1 and 2		✓ 40
41.	Final * operations counter reading		✓ 41
42.	General appearance and cleanliness	<u>00024</u>	✓ 42
43.	All tests and inspections marked OK or N/A		✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA
 Tester David Rodriguez Date 7/11/96 Inspector William R. Brown Date 7/11/96

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type	50VCPW 350	-	1200	Amp.	Serial No.	96076545
	6611640611				V. I. Serial No's.	
Style No.	20240307010000000000				Pole 1	9604G35288
Option No.					Pole 2	9605G42484
					Pole 3	9604G34735

No.	TEST DESCRIPTION	✓ = OKAY
1.	Nameplate / Component Verification	✓ 1
2.	Initial operations counter reading	99946 ✓ 2
3.	Control wiring continuity	✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.	✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	N/A ✓ 5
6.	Slow manual charge	✓ 6
7.	Holding pawl stop adjustment	✓ 7
8.	Latch check switch function	✓ 8
9.	Auxiliary switch assembly and operation	✓ 9
10.	Operation at Min., Max., & Rated control voltage	✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	N/A ✓ 11
12.	Anti-pump and electric trip-free	✓ 12
13.	Closing spring charging time < 7 seconds	✓ 13
14.	Position switch function	✓ 14
15.	Shunt trip sneak	✓ 15
16.	Manual trip release; Manual close release	✓ 16
17.	Spring anti-discharge interlock	✓ 17
18.	UV trip operation	N/A ✓ 18
19.	Contact wipe	✓ 19
20.	Contact resistance - micro-Ohms @ 100 Amperes dc	
	Pole # 1 12 Pole # 2 13 Pole # 3 12	✓ 20
	Time parameters - milliseconds	
21.	Closing: Pole # 1 49.5 Pole # 2 49.6 Pole # 3 50.6	✓ 21
22.	Opening ST1: Pole # 1 34.5 Pole # 2 33.7 Pole # 3 34.3	✓ 22
	Opening ST2: Pole # 1 Pole # 2 Pole # 3	N/A ✓ 22
23.	Low frequency withstand 19/27/63/60 KV 1 minute	✓ 23
24.	Vacuum integrity withstand 27/63/60 KV 1 minute	✓ 24

No.	INSPECTION DESCRIPTION	✓ = OKAY
26.	Primary disconnect contact alignment	✓ 26
27.	Position interlocks function	✓ 27
28.	Mechanism interlocks function	✓ 28
29.	Ground contact engagement	✓ 29
30.	Floor tripper operation	✓ 30
31.	Coding plate verification	✓ 31
32.	Correct barriers, properly installed	✓ 32
33.	Correct front panel	✓ 33
34.	Correct escutcheon plate	✓ 34
35.	Correct primary disconnect contacts	✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38.	Hardware correct, tight and none missing	✓ 38
39.	Breaker marked for ✓ Test and ✓ Jig complete	✓ 39
40.	Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41.	Final * operations counter reading	✓ 41
42.	General appearance and cleanliness	00012 ✓ 42
43.	All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester

Date

Inspector

Date

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type	<u>50 VCPW 350</u>	-	<u>1200</u>	Amp.	Serial No.	<u>96076546</u>
	<u>0616040011</u>				V. I. Serial No's.	
Style No.					Pole 1	<u>9604G36367</u>
<u>06140302010000000000</u>					Pole 2	<u>9604G34888</u>
Option No.					Pole 3	<u>9604G34885</u>

No.	TEST DESCRIPTION		✓ = OKAY
1.	Nameplate / Component Verification	<u>99950</u>	✓ 1
2.	Initial operations counter reading		✓ 2
3.	Control wiring continuity		✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.		✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	<u>N/A</u>	✓ 5
6.	Slow manual charge		✓ 6
7.	Holding pawl stop adjustment		✓ 7
8.	Latch check switch function		✓ 8
9.	Auxiliary switch assembly and operation		✓ 9
10.	Operation at Min., Max, & Rated control voltage		✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	<u>N/A</u>	✓ 11
12.	Anti-pump and electric trip-free		✓ 12
13.	Closing spring charging time < 7 seconds		✓ 13
14.	Position switch function		✓ 14
15.	Shunt trip sneak		✓ 15
16.	Manual trip release; Manual close release		✓ 16
17.	Spring anti-discharge interlock		✓ 17
18.	UV trip operation	<u>N/A</u>	✓ 18
19.	Contact wipe		✓ 19
20.	Contact resistance - micro-Ohms @ 100 Amperes dc		
	Pole # 1 <u>10</u> Pole # 2 <u>10</u> Pole # 3 <u>11</u>		✓ 20
	Time parameters - milliseconds		
21.	Closing: Pole # 1 <u>49.2</u> Pole # 2 <u>49.8</u> Pole # 3 <u>49.2</u>		✓ 21
22.	Opening ST1: Pole # 1 <u>33.4</u> Pole # 2 <u>32.6</u> Pole # 3 <u>33.3</u>		✓ 22
	Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____	<u>N/A</u>	✓ 22
23.	Low frequency withstand 19/27/39/60 KV 1 minute		✓ 23
24.	Vacuum integrity withstand 27/39/60 KV 1 minute		✓ 24
No.	INSPECTION DESCRIPTION		✓ = OKAY
26.	Primary disconnect contact alignment		✓ 26
27.	Position interlocks function		✓ 27
28.	Mechanism interlocks function		✓ 28
29.	Ground contact engagement		✓ 29
30.	Floor tripper operation		✓ 30
31.	Coding plate verification		✓ 31
32.	Correct barriers, properly installed		✓ 32
33.	Correct front panel		✓ 33
34.	Correct escutcheon plate		✓ 34
35.	Correct primary disconnect contacts		✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators		✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels		✓ 37
38.	Hardware correct, tight and none missing		✓ 38
39.	Breaker marked for <u>✓</u> Test and <u>✓</u> Jig complete		✓ 39
40.	Lubricated per Drawing 8297A57 Sheet 1 and 2		✓ 40
41.	Final * operations counter reading		✓ 41
42.	General appearance and cleanliness	<u>00016</u>	✓ 42
43.	All tests and inspections marked OK or N/A		✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester

Date

Inspector

Date

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 min. hand inspection.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type <u>50 VCBW 350</u> -- <u>1200</u> Amp.	Serial No. <u>96076547</u>
<u>61616C40611</u>	V. I. Serial No's.
Style No.	Pole 1 <u>9604G34654</u>
<u>2024032701000000000000</u>	Pole 2 <u>9604G36010</u>
Option No.	Pole 3 <u>9604G36354</u>

No.	TEST DESCRIPTION		I = OKAY
1.	Nameplate / Component Verification	<u>9994R</u>	✓ 1
2.	Initial operations counter reading		✓ 2
3.	Control wiring continuity		✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.		✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	<u>N/A</u>	5
6.	Slow manual charge		✓ 6
7.	Holding pawl stop adjustment		✓ 7
8.	Latch check switch function		✓ 8
9.	Auxiliary switch assembly and operation		✓ 9
10.	Operation at Min., Max., & Rated control voltage		✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	<u>N/A</u>	11
12.	Anti-pump and electric trip-free		✓ 12
13.	Closing spring charging time < 7 seconds		✓ 13
14.	Position switch function		✓ 14
15.	Shunt trip sneak		✓ 15
16.	Manual trip release; Manual close release		✓ 16
17.	Spring anti-discharge interlock		✓ 17
18.	UV trip operation	<u>N/A</u>	18
19.	Contact wipe		✓ 19
20.	Contact resistance - micro-Ohms@ 100 Amperes dc Pole # 1 <u>10</u> Pole # 2 <u>10</u> Pole # 3 <u>11</u>		✓ 20
	Time parameters - milliseconds		
21.	Closing: Pole # 1 <u>49.9</u> Pole # 2 <u>50.3</u> Pole # 3 <u>49.8</u>		✓ 21
22.	Opening ST1: Pole # 1 <u>34.2</u> Pole # 2 <u>33.8</u> Pole # 3 <u>34.3</u>		✓ 22
	Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____	<u>N/A</u>	22
23.	Low frequency withstand 19/27/38/60 KV 1 minute		✓ 23
24.	Vacuum integrity withstand 27/38/60 KV 1 minute		✓ 24

No.	INSPECTION DESCRIPTION		I = OKAY
26.	Primary disconnect contact alignment		✓ 26
27.	Position interlocks function		✓ 27
28.	Mechanism interlocks function		✓ 28
29.	Ground contact engagement		✓ 29
30.	Floor tripper operation		✓ 30
31.	Coding plate verification		✓ 31
32.	Correct barriers, properly installed		✓ 32
33.	Correct front panel		✓ 33
34.	Correct escutcheon plate		✓ 34
35.	Correct primary disconnect contacts		✓ 35
36.	CLOSED/OPEN and CHARGED/Discharged indicators		✓ 36
37.	PUSH TO OPEN and PUSH TO CLOSE labels		✓ 37
38.	Hardware correct, tight and none missing		✓ 38
39.	Breaker marked for ✓ Test and ✓ Jig complete		✓ 39
40.	Lubricated per Drawing 8297A57 Sheet 1 and 2		✓ 40
41.	Final * operations counter reading		✓ 41
42.	General appearance and cleanliness	<u>00028</u>	✓ 42
43.	All tests and inspections marked OK or N/A		✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester

Date

Inspector

Date

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

Type	<u>SOVCPW 350</u>	-	<u>1800</u>	Amp.	Serial No.	<u>96076548</u>
	<u>6616C40611</u>				V. I. Serial No's.	
Style No.					Pole 1	<u>9604634733</u>
	<u>00010307010000000000</u>				Pole 2	<u>9604636359</u>
Option No.					Pole 3	<u>9604636364</u>

No. TEST DESCRIPTION

✓ = OKAY

- | | | | |
|--|--------------|-----|----|
| 1. Nameplate / Component Verification | <u>99954</u> | ✓ | 1 |
| 2. Initial operations counter reading | | ✓ | 2 |
| 3. Control wiring continuity | | ✓ | 3 |
| 4. Control wiring insulation 1800V 1 sec., motor 900V 1 min. | | ✓ | 4 |
| 5. W-vac only, control wiring insulation and motor 2,000V 1 min. | | N/A | 5 |
| 6. Slow manual charge | | N/A | 6 |
| 7. Holding pawl stop adjustment | | ✓ | 7 |
| 8. Latch check switch function | | ✓ | 8 |
| 9. Auxiliary switch assembly and operation | | ✓ | 9 |
| 10. Operation at Min., Max, & Rated control voltage | | ✓ | 10 |
| 11. Shunt Trip #2 Min., Max., & Rated control voltage | | N/A | 11 |
| 12. Anti-pump and electric trip-free | | ✓ | 12 |
| 13. Closing spring charging time < 7 seconds | | ✓ | 13 |
| 14. Position switch function | | ✓ | 14 |
| 15. Shunt trip sneak | | ✓ | 15 |
| 16. Manual trip release; Manual close release | | ✓ | 16 |
| 17. Spring anti-discharge interlock | | ✓ | 17 |
| 18. UV trip operation | | N/A | 18 |
| 19. Contact wipe | | ✓ | 19 |
| 20. Contact resistance - micro-Ohms @ 100 Amperes dc | | ✓ | |
| Pole # 1 <u>11</u> Pole # 2 <u>11</u> Pole # 3 <u>11</u> | | ✓ | 20 |
| Time parameters - milliseconds | | ✓ | |
| 21. Closing: Pole # 1 <u>SO. 2</u> Pole # 2 <u>SO. 2</u> Pole # 3 <u>SO. 1</u> | | ✓ | 21 |
| 22. Opening ST1: Pole # 1 <u>368</u> Pole # 2 <u>2362</u> Pole # 3 <u>365</u> | | ✓ | 22 |
| Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____ | | N/A | 22 |
| 23. Low frequency withstand 19/27 <u>68</u> 60 KV 1 minute | | ✓ | 23 |
| 24. Vacuum integrity withstand 27 <u>35</u> 60 KV 1 minute | | ✓ | 24 |

No. INSPECTION DESCRIPTION

✓ = OKAY

- | | | | |
|--|--------------|----|----|
| 26. Primary disconnect contact alignment | ✓ | 26 | |
| 27. Position interlocks function | ✓ | 27 | |
| 28. Mechanism interlocks function | ✓ | 28 | |
| 29. Ground contact engagement | ✓ | 29 | |
| 30. Floor tripper operation | ✓ | 30 | |
| 31. Coding plate verification | ✓ | 31 | |
| 32. Correct barriers, properly installed | ✓ | 32 | |
| 33. Correct front panel | ✓ | 33 | |
| 34. Correct escutcheon plate | ✓ | 34 | |
| 35. Correct primary disconnect contacts | ✓ | 35 | |
| 36. CLOSED/OPEN and CHARGED/Discharged indicators | ✓ | 36 | |
| 37. PUSH TO OPEN and PUSH TO CLOSE labels | ✓ | 37 | |
| 38. Hardware correct, tight and none missing | ✓ | 38 | |
| 39. Breaker marked for <u>✓</u> Test and <u>✓</u> Jig complete | ✓ | 39 | |
| 40. Lubricated per Drawing 8297A57 Sheet 1 and 2 | ✓ | 40 | |
| 41. Final * operations counter reading | ✓ | 41 | |
| 42. General appearance and cleanliness | <u>00026</u> | ✓ | 42 |
| 43. All tests and inspections marked OK or N/A | | ✓ | 43 |

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester	<u>2/15/86</u>	Date	<u>7/15/86</u>	Inspector		Date
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NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

Westinghouse Electric Corporation
Circuit Breaker Quality Assurance Certificate

HNF-SD-CP-ATR-089, REV. 0
Page 55

Type <u>SDVCPW 350</u>	- <u>1200</u> Amp.	Serial No. <u>96076571</u>
<u>6616C40G11</u>		V. I. Serial No's.
Style No.		Pole 1 <u>9604G34873</u>
<u>20240307010000000000</u>		Pole 2 <u>9604G34731</u>
Option No.		Pole 3 <u>9604G34729</u>

No.	TEST DESCRIPTION		✓ = OKAY
1.	Nameplate / Component Verification	99931	✓ 1
2.	Initial operations counter reading		✓ 2
3.	Control wiring continuity		✓ 3
4.	Control wiring insulation 1800V 1 sec., motor 900V 1 min.		✓ 4
5.	W-vac only, control wiring insulation and motor 2,000V 1 min.	<u>N/A</u>	✓ 5
6.	Slow manual charge		✓ 6
7.	Holding pawl stop adjustment		✓ 7
8.	Latch check switch function		✓ 8
9.	Auxiliary switch assembly and operation		✓ 9
10.	Operation at Min., Max, & Rated control voltage		✓ 10
11.	Shunt Trip #2 Min., Max., & Rated control voltage	<u>N/A</u>	✓ 11
12.	Anti-pump and electric trip-free		✓ 12
13.	Closing spring charging time < 7 seconds		✓ 13
14.	Position switch function		✓ 14
15.	Shunt trip sneak		✓ 15
16.	Manual trip release; Manual close release		✓ 16
17.	Spring anti-discharge interlock		✓ 17
18.	UV trip operation	<u>N/A</u>	✓ 18
19.	Contact wipe		✓ 19
20.	Contact resistance - micro-Ohms @ 100 Amperes dc		
	Pole # 1 <u>11</u> Pole # 2 <u>11</u> Pole # 3 <u>12</u>	✓	20
	Time parameters - milliseconds		
21.	Closing: Pole # 1 <u>48.7</u> Pole # 2 <u>48.5</u> Pole # 3 <u>48.5</u>	✓	21
22.	Opening ST1: Pole # 1 <u>34.5</u> Pole # 2 <u>34.4</u> Pole # 3 <u>34.5</u>	✓	22
	Opening ST2: Pole # 1 _____ Pole # 2 _____ Pole # 3 _____	<u>N/A</u>	22
23.	Low frequency withstand 19/27(38)60 KV 1 minute		✓ 23
24.	Vacuum integrity withstand 27(38)60 KV 1 minute		✓ 24

No.	INSPECTION DESCRIPTION	✓ = OKAY
26	Primary disconnect contact alignment	✓ 26
27	Position interlocks function	✓ 27
28	Mechanism interlocks function	✓ 28
29	Ground contact engagement	✓ 29
30	Floor tripper operation	✓ 30
31	Coding plate verification	✓ 31
32	Correct barriers, properly installed	✓ 32
33	Correct front panel	✓ 33
34	Correct escutcheon plate	✓ 34
35	Correct primary disconnect contacts	✓ 35
36	CLOSED/OPEN and CHARGED/Discharged indicators	✓ 36
37	PUSH TO OPEN and PUSH TO CLOSE labels	✓ 37
38	Hardware correct, tight and none missing	✓ 38
39	Breaker marked for ☒ Test and ☒ Jig complete	✓ 39
40	Lubricated per Drawing 8297A57 Sheet 1 and 2	✓ 40
41	Final * operations counter reading	00005 ✓ 41
42	General appearance and cleanliness	✓ 42
43	All tests and inspections marked OK or N/A	✓ 43

THIS CIRCUIT BREAKER MEETS ALL OF THE QUALITY CRITERIA

Tester <u>Paul Rodriguez</u>	Date <u>7/15/96</u>	Inspector <u>William [Signature]</u>
	Date <u>7/15/96</u>	

*NOTE: As part of our continuous quality monitoring program, one breaker each day is given an additional 250 mechanical operations.

SECTION 5

MINI-SUBSTATION 5 KV WLI SWITCH FACTORY TEST RESULT

- A. NAMEPLATE & COMPONENT VERIFICATION
- B. MECHANICAL INSPECTION & FUNCTION
- C. ELECTRICAL OPERATION
- D. ELECTRICAL TERMINATIONS & JOINTS
- E. COMPLETENESS AND CLEANLINESS
- F. DIELECTRIC TESTS OF LOW VOLTAGE WIRING
- G. DIELECTRIC TESTS OF MEDIUM VOLTAGE CIRCUITRY

Form SUM-T-2

Cutler-Hammer Inc.
Sumter, South Carolina

WLI/WVB Switchgear Assembly

Certified Test Report and Inspection Report

G.O. Number: HSW-26522-E Item: 2A
Master P/L: SM96A296 Assembly: 1 Group(s): 1, 2

1. Mechanical Inspection Check [OK]
2. Mechanical Function Check [OK]
3. Electrical Joint Tightness Check [OK]
4. Electrical Operation Check [OK]
5. Dielectric Test, Medium Voltage Circuitry [OK]
19 kV AC 60 Hz RMS for one minute
6. Dielectric Test, Low Voltage Wiring Circuitry [OK]
7. Cleanliness and Completeness Check [OK]

The above items reflect the requirements in ANSI/IEEE C37.20.3 for the production testing and inspection.

D. Hardie
Inspector

7/11/96
Date

David Ayle
Marketing Services Manager

7/11/96
Date

Form SUM-T-2A

Cutler-Hammer Inc.
Sumter, South Carolina

WLI Switch Assembly

Certified Test Report and Inspection Report

G.O. Number: HSW26522E Item: 2A

Master P/L: SM96A296 Assembly: 1 Group: 1

Style Number: 7274A63G0Z

- | | | |
|----|---|------|
| 1. | Mechanical Inspection Check | [OK] |
| 2. | Mechanical Function Check | [OK] |
| 3. | Electrical Joint Tightness Check | [OK] |
| 4. | Electrical Operation Check (When Applicable) | [OK] |
| 5. | Dielectric Test, Medium Voltage Circuitry
<u>19</u> kV AC 60 Hz RMS for one minute | [OK] |
| 6. | Dielectric Test, Low Voltage Wiring Circuitry
(When Applicable) | [NA] |
| 7. | Cleanliness and Completeness Check | [OK] |
| 8. | Pole Path Resistance in Micro-ohms, terminal to terminal | |

Phase 1 23.7 Phase 2 24.5 Phase 3 21.4

The above items reflect the requirements in Future ANSI/IEEE C37.20.4 Draft 19 and in CAN/CSA C22.2 No. 31-M89 and EEMAC G8-3.3 for production testing and inspection.

D. Hardie
Inspector

David Age
Marketing Services Manager

7/11/96
Date

7/11/96
Date

SECTION 6

SUBSTATION & MINI-SUBSTATION COMMISSIONING TEST RESULT

E&ISD

ENGINEERING AND INSTRUMENTATION SERVICES DIVISION

CUTLER-HAMMER POWER CENTERS
PUREX PROJECT

H & N ORDER NO. 0011111
WESTINGHOUSE JOB SEEG403

**FIELD ENGINEERING SERVICE REPORT**

Westinghouse

Job Order: SEEG403

Customer: H and N Electric/United States Department of Energy, PUREX Project

Purpose of Visit: Westinghouse provided commissioning, start up and training for two Cutler-Hammer power centers supplied for the PUREX Project.

Date of Service: December 1996 and January 1997

Persons Contacted: Mr. David Nelson, Babcock & Wilcox Project Engineer
Mr. Edgar Aponte, Cutler-Hammer Project Engineer
Mr. Robert Richard, Cutler-Hammer Sales Engineer

Apparatus ID: The following equipment underwent commissioning and start up:

Qty 1 - line-up of 5 KV switchgear containing

- Qty 14 - vacuum circuit breakers
- Qty 13 - sets of 3 phase current transformers for relaying
- Qty 2 - sets of 2 phase current transformers for metering
- Qty 11 ground fault current transformers
- Qty 2 - sets open delta potential transformers
- Qty 2 - sets wye-wye potential transformers
- Qty 1 - control power transformer
- Qty 8 - GE/Multilin SR 750 relays
- Qty 8 - Basler 47N relays
- Qty 2 - Basler 32R relays
- Qty 14 - 86 lock out relays
- Qty 2 - Ammeters (analog)
- Qty 6 - Voltmeters (analog)

Qty 3 - 750 KVA transformers, dry type

Qty 2 - 480 volt motor control centers

Qty 3 - 5 KV vacuum motor starters

Qty 1 - 5 KV disconnect switch

As Found: Westinghouse noted the following items requiring correction:

5 KV Switchgear:

Cells 5A and 8A (main breakers)

- Metering current transformer secondary wiring polarity reversed at the shorting terminal block.
- Current transformer secondary connections to the 32R power relay reversed.

Report by: Lyle McFarland, Field Service Engineer
Report Date: February 10, 1997
Phone: 206-656-4380

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Westinghouse Electric Corporation
405 SW 41st Street
Renton, WA 98055

**FIELD ENGINEERING SERVICE REPORT**

Westinghouse

Job Order: SEEG403

Cell 9A (spare breaker)

- Terminal block 19A, which connects ground fault current transformer secondary wiring, should be a shorting terminal block. Supplied terminal block is non-shorting.

Cell 9B (feeder breaker)

- Voltmeter sticks at approximately 1.2 KV.

Cell 10A (spare breaker)

- Cell missing sheet metal trim which mates to back of the breaker front cover when the breaker is in the connected position. The trim prevents foreign objects from being inserted into energized breaker components.

Cell 10B(feeder breaker)

- Voltmeter greater than 10 % out of calibration.

Cell 11A (feeder breaker)

- Wiring harness at top of cell not fastened in place.

750 KVA transformers, dry type

T1 and T2 transformer temperature relay control power and PLC connections not terminated.

480 V motor control center

MCC Bldg 1

- Ground fault protection scheme on main circuit breakers not adequate to protect double source, double ground substation. Neutral sensor wiring requires revision to provide adequate ground fault protection. Adding ground fault protection to the tie breaker recommended for selective tripping.
- Main and tie breakers are not interlocked to prevent closing both main breakers and the tie breaker at the same time. Condition would allow tying both incoming lines together without proper fault protection.
- Main breaker rating plug/long delay pick-up greater than 125% of transformer rated full load amps.

**FIELD ENGINEERING SERVICE REPORT**

Westinghouse

Job Order: SEEG403

MCC Mini-sub

- Main breaker neutral sensor improperly installed.
- Main breaker rating plug/long delay pick-up greater than 125% of transformer rated full load amps.

5 KV vacuum motor starters

No corrections required

PLC interconnections

Customer revising PLC interconnections to provide proper operation. Revisions include adding interposing relays to provide circuit isolation and prevent overloading PLC output contacts.

Action Taken:

Westinghouse tested the equipment above listed equipment per the attached Standard Scopes of Work. The following scopes appear:

- SSW2-Switchgear, Low and Medium Voltage
- SSW3A-Circuit Breakers, Medium Voltage Vacuum
- SSW5-Protective Relays, Draw out Type
- SSW5D-Instrument Transformers
- SSW8-Air Switches/Fused Disconnects, Medium Voltage
- SSW10-Transformers, Dry Type
- SSW11-Motor Control/Starters, Medium Voltage
- SSW12- Motor Control/Starters, Low Voltage
- Multilin SR750 Instruction Manual; PRELIMINARIES, INPUTS AND OUTPUTS and METERING sections of chapter 8.

Westinghouse installed attached Multilin SR750 and IQ-1000 Plus relay settings per instruction of David Nelson.

Westinghouse provided the following corrective action or directed installing electricians concerning corrective action:

- Corrected current transformer secondary wiring and marked attached drawings to indicate changes.
- Notified Robert Richard, Cutler-Hammer concerning missing, incorrectly supplied and defective components in 5 KV switchgear.
- Connected control power and PLC interface connections to transformer temperature relays.

**FIELD ENGINEERING SERVICE REPORT****Westinghouse**

Job Order: SEEG403

- Notified Robert Richard, Cutler-Hammer the MCC Bldg. 1 main breaker ground fault protection scheme requires revision and the MCC Mini-sub main breaker neutral sensor requires revision.
- Notified David Nelson, PLC interconnections between 5 KV breaker control and 5 KV motor starter control circuits require interposing relaying. David Nelson and installing electricians are revising PLC connections.
- Corrected improperly wired 110 VAC outlets.

Test Data:

Test data appears on the attached test data sheets. The following items are also attached:

- SR-750 Relay settings
- IQ-1000 Plus settings
- Corrected drawings for 2.4 KV switchgear
- Standard Scopes of Work listed above

Recommendations: Westinghouse recommends the following:

- Recommend installing sync check relaying for the 5 KV switchgear main and tie breakers or interlocking electrically the main and tie breakers to prevent tying together out of sync utility feeds.
- Installing 1000 amp rating plugs in Bldg.1 MCC and Mini-sub MCC main breakers to bring breaker settings within code.
- Upgrading the trip units in the MCC Bldg.1 main and tie breakers; and installing ground fault on the tie to provide selective tripping between the main and tie breakers. The main breaker ground fault scheme requires correction regardless.
- MCC Mini-sub main breaker neutral sensor requires revision.
- Installing shunt trip on MCC Mini-sub main breaker and connecting shunt trip to temperature relay trip for Mini-sub transformer T-3.
- Installing key interlock on MCC Bldg.1 main and tie breakers to prevent closing all three at one time. A key interlock system containing 3 locks and 2 keys would work well.
- Verifying motor designed locked rotor current/time (if available) and reviewing IQ 1000 Plus settings. Change settings as required.



Westinghouse

FIELD ENGINEERING SERVICE REPORT

Job Order: SEEG403

Remarks:

Westinghouse completed testing of the above equipment. The 2.4 KV Switchgear and 2.4 KV Motor starters are ready for energizing once the PLC interconnections are completed. The dry type transformers are also ready for energizing; however, the Bldg. 1 MCC and Mini-sub MCC require revisions to the ground fault systems prior to energizing.

Report by: Lyle McFarland, Field Service Engineer
Report Date: February 10, 1997
Phone: 206-656-4380

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Westinghouse Electric Corporation
405 SW 41st Street
Renton, WA 98055

STANDARD SCOPE OF WORK

STANDARD SCOPE OF WORK
SWITCHGEAR - LOW AND MEDIUM VOLTAGE AIR

SSW2 (4/95)

2.2 Electrical Checks (continued)

Place breakers/drawout devices in the test position and operate electrically (where applicable) several times to assure proper operation.

Operate the breaker from it's protective relays if control power is present.

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STANDARD SCOPE OF WORK

SSW3A (5/95)

SSW 3A.0 CIRCUIT BREAKERS - MEDIUM VOLTAGE VACUUM

3A.1 Mechanical Checks

Inspect breaker assembly (including primary bushings and finger clusters) for damage, distortion, excessive wear and tightness of hardware. Inspect current carrying parts for signs of overheating.

Vacuum and clean breaker assembly.

Verify manual operation by manually charging closing springs, closing and tripping breaker.

Verify the breaker operation counter advances.

Lubricate according to manufacturer's recommendations.

Measure and adjust contact wear gap according to manufacturer's recommendations.

Check auxiliary switch linkage, contact condition, and contact alignment. Check control wiring for satisfactory condition and tight connections.

Rack breaker in and out of cell to verify alignment and proper positioning in cell with no binding.

Levering interlock - verify breaker cannot be racked into cell if closed.

Check cell trip and spring release when breaker is removed from cell.

3A.2 Electrical Checks

Megger test control wiring. (Omit is solid state devices are present.)

STANDARD SCOPE OF WORKCIRCUIT BREAKERS - MEDIUM VOLTAGE VACUUM

SSW3A (5/95)

3A.2 Electrical Checks (continued)

Check breaker insulation resistance with a 1000 volt DC or higher megohmmeter.

1. Phase to phase - breaker closed
2. Phase to ground - breaker closed
3. Across contacts - breaker open

Operate breaker electrically (spring charge, open, and close) several times to assure smooth operation. Check indicating lights. Verify anti-pump features.

Check contact resistance with a low resistance ohmmeter.

Perform high potential test on vacuum interrupters.

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STANDARD SCOPE OF WORK

SSW5 (5/95)

SSW 5.0 PROTECTIVE RELAYS - DRAWOUT TYPE

All protective relays are tested in accordance with the manufacturer's recommendations. In general, these tests include:

5.1 Mechanical Checks

Clean top of case cover prior to removal.

Inspect and clean relay cover. Inspect relay case and clean the interior, if de-energized.

Inspect relay for dust, iron filings, rust or foreign matter.

Inspect relay contacts for freedom of movement.

Check relay mounting hardware, wiring connections and tap screws for tightness.

5.2 Electrical Tests

Insulation Resistance Test. Megger each relay circuit to relay frame.

Time Overcurrent Relay

- Check minimum pick-up.
- Check timing a two or three points which are multiples of tap value current and compare with manufacturer's published curves.
- Check two timing points at three times tap value and at five times tap value, unless otherwise specified.
- Check pick-up of instantaneous trip attachment, if applicable.
- Check operation of target indicator

Directional Overcurrent Relay

- Check operation of directional unit in tripping and non-tripping directions at rated current and voltage.
- Check time overcurrent unit, as described for time overcurrent relay above.

STANDARD SCOPE OF WORK
PROTECTIVE RELAYS - DRAWOUT TYPE

SSW5 (5/95)

5.2 Electrical Tests (continued)

Voltage Controlled Overcurrent Relay

- Check dropout of voltage unit.
- Check time overcurrent unit as described for time overcurrent relay above.

Instantaneous Overcurrent Relay

- Check minimum pick-up.
- Check operation of target indicator.

Current Balance Relay

- Check pick-up of each coil by itself.
- Apply equal current to opposing coils to check for balanced or no-trip condition.
- Check operation of target indicator.

Differential Relay

- Check pick-up of relay with current in one restraint coil and operation coil for each set of windings.
- Check operation of target indicator.

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STANDARD SCOPE OF WORK

SSW5D (4/95)

SSW 5D.0 INSTRUMENT TRANSFORMERS

5D.1 Visual and Mechanical Inspection

Inspect for physical damage and cleanliness.

Check mechanical clearances and proper operation of all disconnecting and grounding devices associated with potential transformers.

Verify proper operation of grounding or shorting devices.

5D.2 Electrical Checks

Confirm transformer polarity electrically.

Confirm transformer ratio.

**WESTINGHOUSE ELECTRIC
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(206) 656-4380**STANDARD SCOPE OF WORKSSW8 (5/95)**SSW 8.0 AIR SWITCHES/FUSED DISCONNECTS - MEDIUM AND HIGH VOLTAGE****8.1 Mechanical Checks**

Inspect cleanliness of switch mechanism and enclosure. Note condition of ventilating louvers and air filters (if applicable).

Inspect for proper alignment, anchorage and grounding.

Inspect switch assembly, bus, cable terminals, fuses, fuse clips, etc., for signs of cracked insulation, tracking, corona discharge, overheating, mechanical stress, etc.

Check space heaters and thermostats for proper operation (if applicable).

Check main and arcing contact blades for proper alignment and operation (quick make and break).

Check operating mechanism and key or mechanical interlocks for proper operation. Lubricate according to manufacturer's recommendations.

Check each fuse assembly for discrepancies in rating and size (if applicable).

Check finger clusters, disconnect studs and drawout mechanism for proper alignment and operation (if applicable). Lubricate according to manufacturer's recommendations.

8.2 Electrical Checks

Perform insulation resistance test across open contacts for each pole.

Perform contact resistance tests on each pole with a low resistance ohmmeter.

Perform resistance tests with a low resistance ohmmeter across each fuse assembly (if applicable).

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**ENERGY SERVICES
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STANDARD SCOPE OF WORK

SSW10 (5/95)

SSW 10.0 TRANSFORMERS - DRY TYPE

10.1 Mechanical Checks

Remove shipping braces and free resilient supports (if applicable).

Inspect transformer for loose bracing, loose iron, adequate ventilation clearances and proper grounding connections.

Inspect windings for evidence of problems due to corona leakage, tracking, overheating, clogged airways, and damaged insulation.

Inspect transformer for cleanliness of enclosure, filters, and core and coil.

Inspect insulators and bushings.

10.2 Electrical Checks

Check insulation resistance of high and low voltage windings with a DC megohmmeter as follows:

1. High voltage to low voltage and ground
2. Low voltage to high voltage and ground
3. High and low voltage to ground

Check for proper operation of auxiliary devices such as cooling fans and fan control.

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STANDARD SCOPE OF WORK

SSW11 (5/95)

SSW 11.0 MOTOR CONTROL/STARTERS - MEDIUM VOLTAGE

11.1 Mechanical Checks

Vacuum and wipe clean starter cell interiors, contactor and isolating switch, where practical.

Torque accessible bus bolts.

Inspect structure frames, supports, barriers, etc. for alignment and proper fit.

Inspect fuse isolating switches for alignment, wear or breakage. Check fuse clips for signs of overheating, good tension and contact surface.

Check interlock scheme to verify proper operation.

Check contactor for deterioration, breakage or excessive wear.

Remove arc chutes, blow out and inspect for signs of heating, cracks, broken or missing parts.

Inspect contacts for wear. Check against manufacturer's specifications for wipe, closing sequence, open gap, alignment and resistance.

Lubricate contacts and drawout finger clusters according to manufacturer's recommendations.

Inspect cell racking mechanism.

Inspect transition resistors or starting autotransformers for breakage, insulation failure, tight connections, etc.

STANDARD SCOPE OF WORK
MOTOR CONTROL/STARTERS - MEDIUM VOLTAGE

SSW11 (5/95)

11.2 Electrical Checks

Check insulation with a 1000V or higher DC megohmmeter phase to phase, phase to ground.

Check contactor insulation resistance with a DC megohmmeter phase to phase and phase to ground.

Check control circuit insulation resistance with a DC megohmmeter. (Do not test if solid state devices are in the circuit.)

Test thermal overload relays for conformance with manufacturer's specifications.

Install contactor in test position (if possible) and operate several times to assure smooth operation.

**WESTINGHOUSE ELECTRIC
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(206) 656-4380**STANDARD SCOPE OF WORKSSW12 (5/95)**SSW 12.0 MOTOR CONTROL/STARTERS - LOW VOLTAGE****12.1 Mechanical Checks**

Compare overload heaters with motor full load current for proper size, when I.B. and current value is provided.

Vacuum and wipe clean starter interiors.

Torque accessible bus bolts to their proper values and check for proper grounding.

Inspect structure frames, supports, barriers, etc. for alignment and proper fit.

Check starter for deterioration, breakage or excessive wear.

Check starter plug-in stabs for proper engagement and signs of overheating (only when accessible).

Inspect transition resistors or starting autotransformers for breakage, insulation failure, tight connections, etc., when applicable.

Check all control wiring for tightness.

12.2 Electrical Tests

Test bus insulation with a DC megohmmeter phase to phase and phase to ground for one minute (where practical).

Test starter insulation with a DC megohmmeter phase to phase and phase to ground, with starter contacts closed and protective device open.

12.2 Electrical Tests (continued)

Perform operational test on starter local control circuit.

MULTILIN SR 750 TEST
PROCEDURE



PRELIMINARIES

PRELIMINARIES

SAFETY PRECAUTIONS



DANGEROUSLY HIGH VOLTAGES ARE PRESENT ON THE REAR TERMINALS OF the relay, CAPABLE OF CAUSING DEATH OR SERIOUS INJURY. USE EXTREME CAUTION AND FOLLOW ALL SAFETY RULES WHEN HANDLING, TESTING, OR ADJUSTING THE EQUIPMENT.



DO NOT OPEN THE SECONDARY CIRCUIT OF A LIVE CT, SINCE THE HIGH VOLTAGE PRODUCED IS CAPABLE OF CAUSING DEATH OR SERIOUS INJURY, OR DAMAGE TO THE CT INSULATION.



THE RELAY USES COMPONENTS WHICH ARE SENSITIVE TO ELECTROSTATIC DISCHARGES. WHEN HANDLING THE UNIT, CARE SHOULD BE TAKEN TO AVOID CONTACT WITH TERMINALS AT THE REAR OF THE RELAY.



ENSURE THAT THE CONTROL POWER APPLIED TO THE RELAY, AND THE AC CURRENT AND VOLTAGE INPUTS, MATCH THE RATINGS SPECIFIED ON THE RELAY NAMEPLATE. DO NOT APPLY CURRENT TO THE CT INPUTS IN EXCESS OF THE TIME x CURRENT SPECIFIED LIMITS.



ENSURE THAT THE LOGIC INPUT WET CONTACTS ARE CONNECTED TO VOLTAGES BELOW THE MAXIMUM VOLTAGE SPECIFICATION OF 300 VDC.

CONVENTIONS

The following conventions are used for the remainder of this chapter:

- All setpoints and actual values are mentioned with their "path" as a means of specifying where to find the particular message. For instance, the setpoint PHASE CT PRIMARY, which in the message structure is located under setpoints page S2 SYSTEM SETUP as the first message under subheading CURRENT SENSING, would be written as: S2 SYSTEM SETUP / CURRENT SENSING / PHASE CT PRIMARY.
- Phase rotation of the relay test set is ABC.
- A current which lags a voltage has a positive phase angle.
- Phase A to neutral voltage is indicated by Van (arrowhead on the "a").
- Phase A to B voltage is indicated by Vab (arrowhead on the "a").
- The sign convention for power parameters is per Figure 6.5.

The actual value display at the beginning of some sections is the display for the measured parameter.

TEST EQUIPMENT REQUIRED

Excluding the tests in section 8.3, which checks A/D data acquisition of AC system currents and voltages, tests may be performed using the powerful simulation feature of the relay, without the need of external AC voltage and current inputs. System parameters, such as current and voltage phasor information, are entered as setpoints. When placed in simulation mode, the relay suspends reading actual AC inputs, and uses the programmed phasors to generate sample values which are placed in the Trace Memory. All metering calculations (i.e. the "calculated values" in section 8.4), and logic associated with protection, monitoring, and control, are performed normally, using phasors calculated from the samples placed in the memory instead of phasors generated from the input parameter data acquisition system. The advantage of using simulation is that all metering calculations can be proven without the inaccuracies associated with current and voltage sources.

Assuming that the simulation feature is not used, the following equipment is necessary to perform any test included in this chapter:

General Purpose:

- 3 ϕ variable current and voltage source (V, A, ϕ , Hz)
- 3 ϕ power multimeter (V, A, ϕ , Hz, W, var, VA, Wh, varh, PF)
- variable DCmA source
- accurate timing device
- multimeters

**MULTILIN****PRELIMINARIES**

- two single-throw switches
- two momentary pushbuttons, gang operated, double contacts: 1 x normally open and 1 x normally closed
- two variable resistors, 250 k Ω , 2 W

Specific Purpose:

- Breaker Arcing Current: requires a dynamic relay test set with at least three preset current levels, and a 2-channel storage oscilloscope. This test also requires a DC supply of ≥ 10 V, and a resistor of about 10 W at 0.1 Ω
- Time O/C Reset Times: dynamic relay test set, as above
- Synchrocheck requires two single phase variable voltage sources with adjustable frequency and phase
- Distance-to-fault requires a dynamic test set, as above
- Analog Input Rate-of-Change: requires a dc current generator with the capacity to generate current ramps adjustable for durations from 1 minute to 1 hour, from 0-20 mA.

Optional:

- PC running MS-DOS version 3.3 or later for the 750SETUP or 760SETUP programs

INSTALLATION CHECKS

READ the relay manual and Multilin instructions.

CHECK that the relay settings are approved by the appropriate authority.

CHECK that the installed relay agrees with the drawings, particularly the Analog Output range.

CHECK that the relay phase current inputs, specified on the nameplate, are correct for the connected phase current transformers.

CHECK that the relay ground current input, specified on the nameplate, is correct for the connected ground current transformer (if applicable).

CHECK that the relay auxiliary voltage, specified on the nameplate, is correct for the supplied voltage.

CHECK that the external wiring is correct to the relevant relay diagram or scheme diagram.

CHECK that all grounding connections at the rear of the relay are properly connected to the ground bus.

RELAY TEST SETUPS

RELAY TEST SETUPS

Figure 8.1: RELAY TEST WIRING - WYE CONNECTION

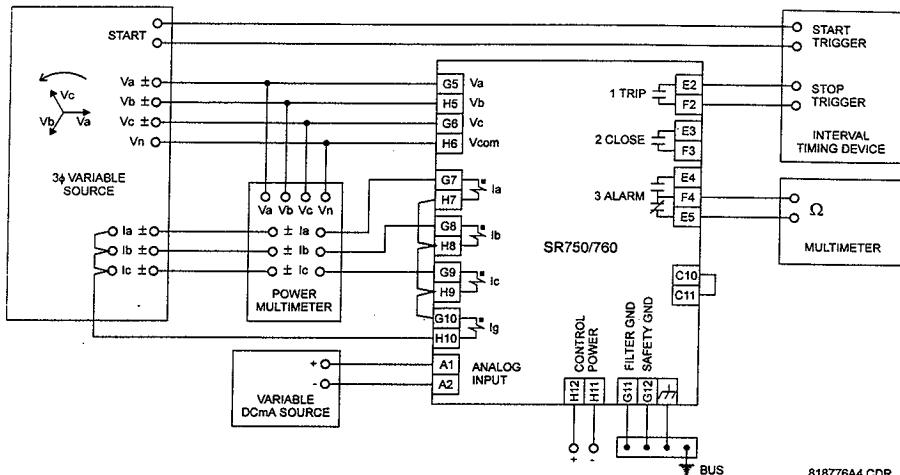
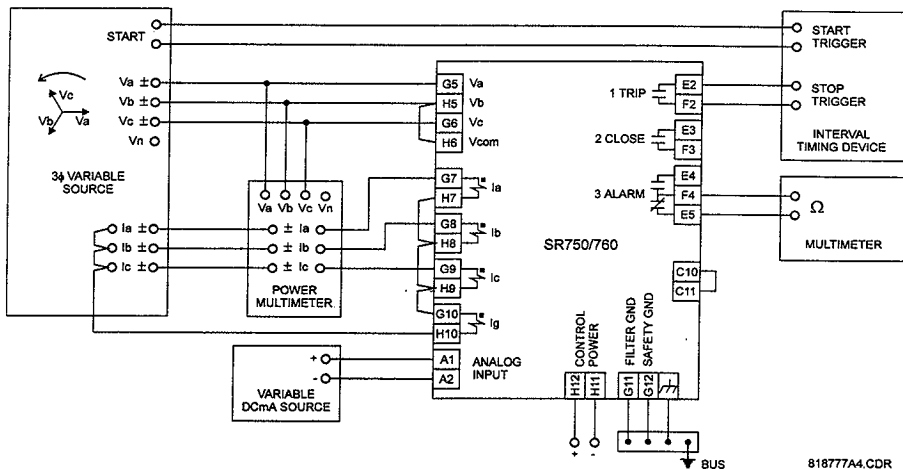


Figure 8.2: RELAY TEST WIRING - DELTA CONNECTION



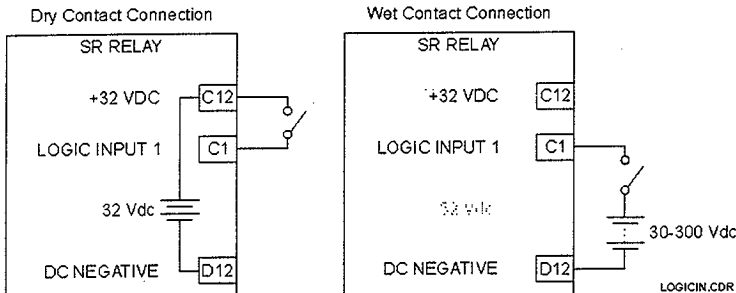


INPUT AND OUTPUT CONTACTS

INPUT AND OUTPUT CONTACTS

INPUT SWITCHES

Figure 8.3: DRY AND WET CONTACT CONNECTIONS

**Actual Value Displays:**

Under subheading A1 STATUS / LOGIC INPUTS / LOGIC INPUT 1 (2-14) STATE

Procedure:

1. Enter setting under subheadings S3 LOGIC INPUTS / LOGIC INPUT 1 (2-14) / LOGIC INPUT 1 FUNCTION: **Disabled**
2. Connect a switch between LOGIC INPUT 1 (terminal C1) and +32VDC (terminal C12), as shown in Figure 8.3.
3. With the switch contacts open, check that the input state is detected and displayed as "Open."
4. Close the switch contacts. Check that the input state is detected and displayed as "Closed."
5. Repeat for all the relay logic inputs.

OUTPUT RELAYS

Indicators:

Front panel OUTPUT STATUS indicators.

Procedure:

1. Enter settings under subheading S7 TESTING / OUTPUT RELAYS / FORCE OUTPUT RELAYS FUNCTION: **Enabled**
(This setting places the relay in test mode, where all output relays can be controlled manually.)
FORCE 1 TRIP RELAY: **De-energized**
FORCE 2 CLOSE RELAY: **De-energized**
FORCE 3 ALARM RELAY: **De-energized**
FORCE 4 AUXILIARY RELAY: **De-energized**
FORCE 5 AUXILIARY RELAY: **De-energized**
FORCE 6 AUXILIARY RELAY: **De-energized**
FORCE 7 AUXILIARY RELAY: **De-energized**
FORCE 8 SERVICE RELAY: **De-energized**
FORCE SOLID STATE OUTPUT: **De-energized**
2. Using a multimeter, check that all outputs are de-energized (i.e. N.O. contacts are open, N.C. contacts are closed).
3. Change setting to: S7 TESTING / OUTPUT RELAYS / FORCE 1 TRIP RELAY: **Energized**
4. Check that the 1 TRIP output is energized (i.e. N.O. contacts are closed), and the 1 TRIP indicator on the faceplate is illuminated.
5. Change setting to: S7 TESTING / OUTPUT RELAYS / FORCE 1 TRIP RELAY: **De-Energized**
6. Repeat steps 3 and 4 for all outputs.
7. Change setting to: S7 TESTING / OUTPUT RELAYS / FORCE OUTPUT RELAYS FUNCTION: **Disabled**



METERING

METERING

PRELIMINARY SETUP

In order to reduce repetition, and to use make use of some of the relay features in the testing process, setpoint settings are assumed to be at the factory default values (as shown in the manual). General settings for a particular installation are presented here to avoid duplication in each test section. All of the following test procedures assume the settings listed here have been programmed into the relay.

NOTE: Carefully review the settings on all setpoints when testing is completed, and change any settings as required by the application.

Common Settings:

1. Enter settings under subheading S1 SR750(SR760) SETUP / CLOCK /
DATE (MM/DD/YYYY): **As Required**
TIME (HH:MM:SS): **As Required**
2. Enter settings under subheading S1 SR750(SR760) SETUP / CLEAR DATA /
CLEAR ENERGY USE DATA? **Yes**
CLEAR MAX DEMAND DATA? **Yes**
CLEAR EVENT RECORDER DATA? **Yes**
3. Enter settings under subheading S1 SR750(SR760) SETUP / INSTALLATION /
SR750(SR760) OPERATION: **Ready**
RESET TRIP COUNTER DATA? **Yes**
RESET ARCING CURRENT DATA? **Yes**
4. Enter settings under subheading S2 SYSTEM SETUP / CURRENT SENSING /
PHASE CT PRIMARY: **As Required**
GROUND CT PRIMARY: **As Required**
POLARIZING CT PRIMARY: **As Required**
5. Enter settings under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **As Required**
NOMINAL VT SECONDARY VOLTAGE: **As Required**
VT RATIO: **As Required**
6. Enter settings under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / LINE VT /
VT CONNECTION: **As Required**
NOMINAL VT SECONDARY VOLTAGE: **As Required**
VT RATIO: **As Required**
7. Enter setting under subheading S2 SYSTEM SETUP / POWER SYSTEM /
NOMINAL FREQUENCY: **As Required**
8. Enter settings under subheading S5 PROTECTION / PHASE CURRENT /
PHASE TIME O/C / PHASE TIME O/C FUNCTION: **Disabled**
PHASE LOSET O/C / PHASE LOSET O/C FUNCTION: **Disabled**
PHASE HISET O/C / PHASE HISET O/C FUNCTION: **Disabled**
9. Enter settings under subheading S5 PROTECTION / GROUND CURRENT /
GROUND TIME O/C / GROUND TIME O/C FUNCTION: **Disabled**
GROUND LOSET O/C / GROUND LOSET O/C FUNCTION: **Disabled**
GROUND.HISET O/C / GROUND.HISET O/C FUNCTION: **Disabled**
10. Enter settings under subheading S5 PROTECTION / NEUTRAL CURRENT /
NEUTRAL TIME O/C / NEUTRAL TIME O/C FUNCTION: **Disabled**
NEUTRAL LOSET O/C / NEUTRAL LOSET O/C FUNCTION: **Disabled**
NEUTRAL HISET O/C / NEUTRAL HISET O/C FUNCTION: **Disabled**

MEASUREMENT OF INPUT CURRENT

Expected Accuracy: 1 A CTs: ± 0.01 A for 0.05 to 1.99 A
 ± 0.2 A for 2.00 to 20.00 A

5 A CTs: ± 0.05 A for 0.25 to 9.99 A
 ± 1.0 A for 10.00 to 100.00 A

PHASE AND NEUTRAL CURRENT INPUTS

Actual Values Displays:

Under subheading A2 METERING / CURRENT /



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METERING

A: B: C: Amps
NEUTRAL CURRENT
AVERAGE CURRENT

Procedure:

Inject 3-phase unbalanced current of various values into the relay per Figure 8.1 and note the phase and neutral current.

GROUND CURRENT INPUT

Actual Values Displays:

Under subheading A2 METERING / CURRENT /
GROUND CURRENT

Procedure:

Inject current of various values into the relay ground input, terminals G10-H10 and note the ground current.

MEASUREMENT OF INPUT VOLTAGE

BUS VOLTAGE MAGNITUDE

Expected Accuracy:

Phase-neutral voltages	$\pm 0.68 \text{ V}$ for 50 to 130 V	$\pm 2.18 \text{ V}$ for all other voltages within the specified limits
Phase-phase voltages	$\pm 0.55\text{V}$ for 50 to 130 V (V_{ab} and V_{cb})	$\pm 1.10\text{V}$ for 50 to 130 V (calculated V_{ac})
	$\pm 0.82\text{V}$ for all other voltages within the specified limits (V_{ab} and V_{cb})	
	$\pm 1.64\text{V}$ for all other voltages within the specified limits (calculated V_{ac})	

Actual Values Displays:

Under subheading A2 METERING / VOLTAGE /
AB: BC: CA: kVolts
AVERAGE LINE VOLTAGE: kV
AN: BN: CN: kVolts (not available when connected Delta)
AVERAGE PHASE VOLTAGE: kV (not available when connected Delta)

Procedure:

WYE CONNECTED VTs:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT
VT CONNECTION TYPE: **Wye**
2. Inject 3-phase wye voltage of various values into the relay per Figure 8.1.

DELTA CONNECTED VTs:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT
VT CONNECTION TYPE: **Delta**
2. Inject 3-phase delta voltage of various values into the relay per Figure 8.2.

BUS VOLTAGE FREQUENCY

Expected Accuracy:

Frequency: $\pm 0.02 \text{ Hz}$ of injected value within the range 47.00 to 63.00 Hz
Undervoltage Inhibit: 15% ($\pm$ errors noted under voltage magnitude) of setpoint NOMINAL VT SECONDARY VOLTAGE

Actual Values Displays:

Under subheading A2 METERING / POWER SYSTEM / FREQUENCY /
SYSTEM FREQUENCY

Procedure:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT
VT CONNECTION TYPE: **Wye or Delta**

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METERING

- Inject a voltage of nominal value at nominal frequency into phase A per Figure 8.1 (for Wye VTs), or Figure 8.2 (for Delta VTs). Check that the frequency is measured and displayed.
- Check the undervoltage inhibit level by slowly reducing the voltage until the frequency is no longer measured, and "0.00 Hz" is displayed.
- Return the voltage to nominal. Adjust the frequency above and below nominal, check the frequency measured by the relay.

LINE VOLTAGE MAGNITUDE AND FREQUENCY

Expected Accuracy:

Voltage: ± 0.68 V for 50 to 130 V

Frequency: ± 0.02 Hz of injected value within the range 47.00 to 63.00 Hz

Actual Values Displays:

Under subheading A2 METERING / VOLTAGE /
SYNCHRONIZING VOLTS - kV @ Hz.

Under subheading A2 METERING / VOLTAGE /
SYNCHRO - Δ V: $\Delta\Phi$: Δ F

Procedure:

Inject voltage of various magnitudes and frequency values into the relay.

MEASUREMENT OF REAL POWER AND WATTHOURS

Expected Accuracy:

Real Power: $\pm 1\%$ of full scale currents 5 to 199% of nominal voltages 50 to 130 V
Watthours: $\pm 2\%$ of full scale currents 5 to 199% of nominal voltages 50 to 130 V

Actual Values Displays:

Under subheading A2 METERING / POWER SYSTEM / POWER /
REAL POWER

Under subheading A2 METERING / POWER SYSTEM / ENERGY USE /
POSITIVE WATTHOURS
NEGATIVE WATTHOURS

Procedure:

WYE CONNECTED VTs:

- Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: *Wye*
- To reduce the time required to check watthour measurements, set the input VT and CT ratios to high values.
- Inject 3-phase wye voltage and current of various values and angles into the relay per Figure 8.1. Check that real power is measured and displayed.
- Maintain voltage and current at various settings for a time sufficient to achieve a minimum of 20 MWh for each test interval. Check that watthours is measured and displayed. Note that watthours for load in the positive direction and in the negative direction are stored in separate registers. The test procedure should be performed for loads in each direction.

DELTA CONNECTED VTs:

- Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: *Delta*
- Follow the procedure outlined above, except inject two voltages approximately 60 degrees apart into the voltage inputs, as per Figure 8.2.

MEASUREMENT OF REACTIVE POWER AND VARHOURS

Expected Accuracy:

Reactive Power: $\pm 1\%$ of full scale currents 5 to 199% of nominal voltages 50 to 130 V
Varhours: $\pm 2\%$ of full scale currents 5 to 199% of nominal voltages 50 to 130 V



METERING

Actual Values Displays:

Under subheading A2 METERING / POWER SYSTEM / POWER /
REACTIVE POWER
Under subheading A2 METERING / POWER SYSTEM / ENERGY USE /
POSITIVE VARHOURS
NEGATIVE VARHOURS

Procedure:

WYE CONNECTED VTs:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **Wye**
2. To reduce the time required to check watt-hour measurements, set the input VT and CT ratios to high values.
3. Inject 3-phase wye voltage and current of various values and angles into the relay per Figure 8.1. Check that reactive power is measured and displayed.
4. Maintain voltage and current at various settings for a time sufficient to achieve a minimum of 20 Mvarh for each test interval. Check that varhours is measured and displayed. Note that varhours for load in the positive direction and in the negative direction are stored in separate registers. The test procedure should be performed for loads in each direction.

DELTA CONNECTED VTs:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **Delta**
2. Follow the procedure outlined above, except inject two voltages approximately 60 degrees apart into the voltage inputs, as per Figure 8.2.

MEASUREMENT OF APPARENT POWER

Expected Accuracy:

± 1% of full scale currents 5 to 199% of nominal voltages 50 to 130 V

Actual Values Displays:

Under subheading A2 METERING / POWER /
APPARENT POWER

Procedure:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **Wye or Delta**
2. Inject 3-phase voltage (Wye or Delta, as programmed in step 1) and 3-phase current of various values and angles into the relay per Figure 8.1 or Figure 8.2. Check that apparent power is measured and displayed.

MEASUREMENT OF POWER FACTOR

Expected Accuracy: ± 0.02 of injected value currents 5 to 199% of nominal voltages 50 to 130 V

Actual Values Displays:

Under subheading A2 METERING / POWER /
POWER FACTOR

Procedure:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **Wye or Delta**
2. Inject 3-phase voltage (Wye or Delta, as programmed in step 1) and 3-phase current of various values and angles into the relay per Figure 8.1 or Figure 8.2. Check that power factor is measured and displayed. Note that power factor as measured by the relay is the total 3-phase value, based on $PF = \text{total } 3\phi \text{ real power} / \text{total } 3\phi \text{ apparent power}$.

MEASUREMENT OF CURRENT DEMAND

Expected Accuracy: ± 2.0% of full scale

Notes:

1. To reset the "Last Demand" reading to 0 between tests, cycle the relay power source off/on.



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2. Block Interval and Rolling demand measurement types must be tested in synchronization with the internal clock. Both of these measurements start with the first interval of the day at 12:00:00.000 midnight. To synchronize, preset the injection levels, then turn the current off. Select the relay display (not the SETUP program) to A1 STATUS / CLOCK / CURRENT TIME. Apply the test current when the clock is at the beginning of an interval measurement period, as determined by the TIME INTERVAL setpoint for the element.

Actual Values Displays:

Under subheading A2 METERING / DEMAND / PHASE A CURRENT /

LAST PHASE A CURRENT DEMAND
MAX PHASE A CURRENT DEMAND
MAX PHASE A CURRENT DATE
MAX PHASE A CURRENT TIME

Under subheading A2 METERING / DEMAND / PHASE B CURRENT /

LAST PHASE B CURRENT DEMAND
MAX PHASE B CURRENT DEMAND
MAX PHASE B CURRENT DATE
MAX PHASE B CURRENT TIME

Under subheading A2 METERING / DEMAND / PHASE C CURRENT /

LAST PHASE C CURRENT DEMAND
MAX PHASE C CURRENT DEMAND
MAX PHASE C CURRENT DATE
MAX PHASE C CURRENT TIME

Procedure:

Thermal Exponential Demand:

1. Enter settings under subheading S6 MONITORING / DEMAND / CURRENT /

CURRENT DEMAND FUNCTION: *Disabled*
MEASUREMENT TYPE: *Thermal Exponential*
THERMAL 90% RESPONSE TIME: *5 min*

2. Clear demand data registers by entering "Yes" at message S1 the relay SETUP / CLEAR DATA / CLEAR MAX DEMAND DATA?.

3. Inject a fixed value of current into phase A per Figure 8.1. Record the measured current demand at 1, 2, 3, 4, 5 and 10 min after the application of current. The demand, in percent of injected current, should be as follows:

Time (min)	1	2	3	4	5	10
Demand (% of Input)	36.9	60.1	74.8	84.1	90.0	99.0

4. For other setpoint response time settings, use the table above, but multiply the times in row 1 by [selected response time ÷ 5].

5. After the test, check that the maximum current demand, including date and time of occurrence, is recorded and displayed.

6. Repeat steps 2 to 5 for phases B and C.

Block Interval Demand:

1. Enter settings under subheading S6 MONITORING / DEMAND / CURRENT /

CURRENT DEMAND FUNCTION: *Disabled*...
MEASUREMENT TYPE: *Block Interval*
TIME INTERVAL: *5 min*

2. Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured current demand at 1, 2, 3, 4, 5 and 6 min after the application of current. The demand, in percent of injected current, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	0.0	0.0	0.0	0.0	100.0	100.0



METERING

Rolling Demand:

1. Enter settings under subheading S6 MONITORING / DEMAND / CURRENT /

CURRENT DEMAND FUNCTION: *Disabled*

MEASUREMENT TYPE: *Rolling Demand*

TIME INTERVAL: *5 min*

2. Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured current demand at 1, 2, 3, 4, 5 and 6 min after the application of current. The demand, in percent of injected current, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	20.0	40.0	60.0	80.0	100.0	100.0

MEASUREMENT OF REAL POWER DEMAND

Expected Accuracy: $\pm 2.0\%$ of full scale

Notes:

1. To reset the "Last Demand" reading to 0 between tests, cycle the relay power source off/on.
2. Block Interval and Rolling demand measurement types must be tested in synchronization with the internal clock. Both of these measurements start with the first interval of the day at 12:00:00.000 midnight. To synchronize, preset the injection levels, then turn the current off. Select the relay display (not the SETUP program) to A1 STATUS / CLOCK / CURRENT TIME. Apply the test current when the clock is at the beginning of an interval measurement period, as determined by the TIME INTERVAL setpoint for the element.

Actual Values Displays:

Under subheading A2 METERING / DEMAND / REAL POWER /

LAST REAL POWER DEMAND

MAX REAL POWER DEMAND

MAX REAL POWER DATE

MAX REAL POWER TIME

Procedure:

Thermal Exponential Demand:

1. Enter settings under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: *Wye or Delta*
2. Enter settings under subheading S6 MONITORING / DEMAND / REAL POWER /
REAL POWER DEMAND FUNCTION: *Disabled*
MEASUREMENT TYPE: *Thermal Exponential*
THERMAL 90% RESPONSE TIME: *5 min*
3. Clear demand data registers by entering "Yes" at message S1 the relay SETUP / CLEAR DATA / CLEAR MAX DEMAND DATA?.
4. Inject fixed values of 3-phase current and voltage per Figure 8.1 or Figure 8.2. Record the measured real power demand at 1, 2, 3, 4, 5 and 10 min after application of real power. The demand, in percent of injected real power, should be as follows:

Time (min)	1	2	3	4	5	10
Demand (% of Input)	36.9	60.1	74.8	84.1	90.0	99.0

5. For other setpoint response time settings, use the table above, but multiply the times in row 1 by [selected response time $\div 5$].
6. After the test, check that the maximum real power demand, including date and time of occurrence, is recorded and displayed.

Block Interval Demand:

1. Enter settings under subheading S6 MONITORING / DEMAND / REAL POWER /

REAL POWER DEMAND FUNCTION: *Disabled*

MEASUREMENT TYPE: *Block Interval*

TIME INTERVAL: *5 min*



METERING

2. Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured real power demand at 1, 2, 3, 4, 5 and 6 min after the application of real power. The demand, in percent of injected real power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	0.0	0.0	0.0	0.0	100.0	100.0

Rolling Demand:

1. Enter settings under subheading S6 MONITORING / DEMAND / REAL POWER /

REAL POWER DEMAND FUNCTION: **Disabled**

MEASUREMENT TYPE: **Rolling Demand**

TIME INTERVAL: **5 min**

2. Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured real power demand at 1, 2, 3, 4, 5 and 6 min after the application of real power. The demand, in percent of injected real power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	20.0	40.0	60.0	80.0	100.0	100.0

MEASUREMENT OF REACTIVE POWER DEMAND

Expected Accuracy: $\pm 2.0\%$ of full scale

Notes:

1. To reset the "Last Demand" reading to 0 between tests, cycle the relay power source off/on.
2. Block Interval and Rolling demand measurement types must be tested in synchronization with the internal clock. Both of these measurements start with the first interval of the day at 12:00:00.000 midnight. To synchronize, preset the injection levels, then turn the current off. Select the relay display (not the SETUP program) to A1 STATUS / CLOCK / CURRENT TIME. Apply the test current when the clock is at the beginning of an interval measurement period, as determined by the TIME INTERVAL setpoint for the element.

Actual Values Displays:

Under subheading A2 METERING / DEMAND / REACTIVE POWER /

LAST REACTIVE POWER DEMAND

MAX REACTIVE POWER DEMAND

MAX REACTIVE POWER DATE

MAX REACTIVE POWER TIME

Procedure:

Thermal Exponential Demand:

1. Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT / VT CONNECTION TYPE: **Wye or Delta**

2. Enter settings under subheading S6 MONITORING / DEMAND / REACTIVE POWER /

REACTIVE PWR DEMAND FUNCTION: **Disabled**

MEASUREMENT TYPE: **Thermal Exponential**

Thermal 90% RESPONSE TIME: **5 min**

3. Clear demand data registers by entering "Yes" at message S1 the relay SETUP / CLEAR DATA / CLEAR MAX DEMAND DATA?

4. Inject fixed values of 3-phase current and voltage per Figure 8.1 or Figure 8.2. Record the measured reactive power demand at 1, 2, 3, 4, 5 and 10 min after application of reactive power. The demand, in percent of injected reactive power, should be as follows:

Time (min)	1	2	3	4	5	10
Demand (% of Input)	36.9	60.1	74.8	84.1	90.0	99.0

5. For other setpoint response time settings, use the table above, but multiply the times in row 1 by [selected response time $\div 5$].
6. After the test, check that the maximum reactive power demand, including date and time of occurrence, is recorded and displayed.

Block Interval Demand:

- Enter settings under subheading S6 MONITORING / DEMAND / REACTIVE POWER /
REACTIVE PWR DEMAND FUNCTION: **Disabled**
MEASUREMENT TYPE: **Block Interval**
TIME INTERVAL: **5 min**
- Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured reactive power demand at 1, 2, 3, 4, 5 and 6 min after the application of reactive power. The demand, in percent of injected reactive power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	0.0	0.0	0.0	0.0	100.0	100.0

Rolling Demand:

- Enter settings under subheading S6 MONITORING / DEMAND / REACTIVE POWER /
REACTIVE PWR DEMAND FUNCTION: **Disabled**
MEASUREMENT TYPE: **Rolling Demand**
TIME INTERVAL: **5 min**
- Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured reactive power demand at 1, 2, 3, 4, 5 and 6 min after the application of reactive power. The demand, in percent of injected reactive power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	20.0	40.0	60.0	80.0	100.0	100.0

MEASUREMENT OF APPARENT POWER DEMAND

Expected Accuracy: $\pm 2.0\%$ of full scale

Notes:

- To reset the "Last Demand" reading to 0 between tests, cycle the relay power source off/on.
- Block Interval and Rolling demand measurement types must be tested in synchronization with the internal clock. Both of these measurements start with the first interval of the day at 12:00:00.000 midnight. To synchronize, preset the injection levels, then turn the current off. Select the relay display (not the SETUP program) to A1 STATUS / CLOCK / CURRENT TIME. Apply the test current when the clock is at the beginning of an interval measurement period, as determined by the TIME INTERVAL setpoint for the element.

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Actual Values Displays:

Under subheading A2 METERING / DEMAND / APPARENT POWER /
LAST APPARENT POWER DEMAND
MAX APPARENT POWER DEMAND
MAX APPARENT POWER DATE
MAX APPARENT POWER TIME

Procedure:
Thermal Exponential Demand:

- Enter setting under subheading S2 SYSTEM SETUP / VOLTAGE SENSING / BUS VT /
VT CONNECTION TYPE: **Wye or Delta**
- Enter settings under subheading S6 MONITORING / DEMAND / APPARENT POWER /
APPARENT PWR DEMAND FUNCTION: **Disabled**
MEASUREMENT TYPE: **Thermal Exponential**
THERMAL 90% RESPONSE TIME: **5 min**
- Clear demand data registers by entering "Yes" at message S1 the relay SETUP / CLEAR DATA / CLEAR MAX DEMAND DATA?
- Inject fixed values of 3-phase current and voltage per Figure 8.1 or Figure 8.2. Record the measured apparent power demand at 1, 2, 3, 4, 5 and 10 min after application of apparent power. The demand, in percent of injected apparent power, should be as follows:

Time (min)	1	2	3	4	5	10
------------	---	---	---	---	---	----

METERING

Demand (% of Input)	36.9	60.1	74.8	84.1	90.0	99.0
---------------------	------	------	------	------	------	------

- For other setpoint response time settings, use the table above, but multiply the times in row 1 by [selected response time ÷ 5
- After the test, check that the maximum apparent power demand, including date and time of occurrence, is recorded and displayed.

Block Interval Demand:

- Enter settings under subheading S6 MONITORING / DEMAND / APPARENT POWER / APPARENT PWR DEMAND FUNCTION: **Disabled**
 MEASUREMENT TYPE: **Block Interval**
 TIME INTERVAL: **5 min**
- Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured apparent power demand at 1, 2, 3, 4, 5 and 6 min after the application of apparent power. The demand, in percent of injected apparent power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	0.0	0.0	0.0	0.0	100.0	100.0

Rolling Demand:

- Enter settings under subheading S6 MONITORING / DEMAND / APPARENT POWER / APPARENT PWR DEMAND FUNCTION: **Disabled**
 MEASUREMENT TYPE: **Rolling Demand**
 TIME INTERVAL: **5 min**
- Repeat steps 2 to 5 from Thermal Exponential Demand. Record the measured apparent power demand at 1, 2, 3, 4, 5 and 6 min after the application of apparent power. The demand, in percent of injected apparent power, should be as follows:

Time (min)	1	2	3	4	5	6
Demand (% of Input)	20.0	40.0	60.0	80.0	100.0	100.0

CALCULATION OF PERCENT OF LOAD-TO-TRIP

Expected Accuracy: equivalent to that of phase current inputs

Actual Values Displays:

Under subheading A2 METERING / CURRENT /
 % OF LOAD-TO-TRIP

Procedure:

Percent of load-to-trip is calculated from the phase with the highest current reading. It is the ratio of this current to the lowest pickup setting among the following phase overcurrent protection features: PHASE TIME O/C, PHASE LOSET O/C, and PHASE HISET O/C. If all of these features are disabled, the value displayed will be 0.

Reading based on Phase Time O/C Pickup:

- Enter settings under subheading S5 PROTECTION / PHASE CURRENT / PHASE TIME O/C / PHASE TIME O/C FUNCTION: **Trip**
 PHASE TIME O/C CURVE: **Curve 1**
- Enter setting under subheading S5 PROTECTION / O/C CURVE SETUP / CURVE 1 / CURVE 1 PICKUP: *** 0.10 x CT**
- Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE LOSET O/C / PHASE LOSET O/C FUNCTION: **Disabled**
- Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE HISET O/C / PHASE HISET O/C FUNCTION: **Disabled**
- Inject current of various values into phase A per Figure 8.1. Check that percent load-to-trip is calculated and displayed.
- Repeat step 5 for phases B and C.
- Inject 3-phase unbalanced current of various values into the relay. Check that percent load-to-trip is calculated and displayed.

**Reading based on Phase Loset O/C Pickup:**

1. Enter settings under subheading S5 PROTECTION / PHASE CURRENT / PHASE LOSET O/C /
PHASE LOSET O/C FUNCTION: **Trip**
PHASE LOSET O/C PICKUP: ***0.10 x CT**
2. Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE TIME O/C /
PHASE TIME O/C FUNCTION: **Disabled**
3. Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE HISET O/C /
PHASE HISET O/C FUNCTION: **Disabled**
4. Repeat steps 5 to 7 from Phase Time O/C Pickup.

Reading based on Phase Hiset O/C Pickup:

1. Enter settings under subheading S5 PROTECTION / PHASE CURRENT / PHASE HISET O/C /
PHASE HISET O/C FUNCTION: **Trip**
PHASE HISET O/C PICKUP: ***0.10 x CT**
2. Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE TIME O/C /
PHASE TIME O/C FUNCTION: **Disabled**
3. Enter setting under subheading S5 PROTECTION / PHASE CURRENT / PHASE LOSET O/C /
PHASE LOSET O/C FUNCTION: **Disabled**
4. Repeat steps 5 to 7 from Phase Time O/C Pickup.

MEASUREMENT OF ANALOG INPUT

Expected Accuracy: $\pm 1.0\%$ of full scale

Actual Values Displays:

Under subheading A2 METERING / ANALOG INPUT /
ANALOG INPUT

Procedure:

1. Enter setting under subheading S6 MONITORING / ANALOG INPUT / SETUP /
ANALOG INPUT NAME: **As Required**
ANALOG INPUT UNITS: **As Required**
ANALOG INPUT RANGE: **As Required**
ANALOG INPUT MINIMUM VALUE: ***0**
ANALOG INPUT MAXIMUM VALUE: ***MINIMUM**
2. Inject DC current (in mA) of various values into relay terminals A1(+) and A2(-). Check that the analog input is measured and displayed.

TEST DATA SHEETS

2.4 KV SWITCHGEAR AND BREAKERS

TEST DATA SHEET



SWITCHGEAR INSPECTION AND TEST

Form SW2

Customer: <i>US DOE</i>	Location: <i>RICHLAND WA</i>	Job No.: <i>SEEG 403</i>
Bus I.D.: <i>BUS A</i>	Feeder I.D.: <i>MAIN # 1</i>	S.N.:
Manufacturer: <i>CH/NESTINGHOUSE</i>	Type: <i>VAC-CLAD</i>	
Voltage: <i>2400</i>	Bus Amps: <i>1200</i>	Structure Amps: <i>1200</i>
Engineer: <i>L.R. McFARLAND</i>		Date: <i>12-17-96</i>

	AS FOUND CONDITION	COMMENTS
Paint finish - inside & out	<i>OK</i>	
Alignment, leveling, anchoring	<i>OK</i>	
Hardware	<i>OK</i>	
Bus insulation	<i>OK</i>	
Corona/tracking	<i>NONE</i>	
Bus joint insulation	<i>OK</i>	
Bus or cable taping	<i>OK</i>	
Pothead/stress cones	<i>NONE</i>	
Bus supports	<i>OK</i>	
Ground bus and structure gnd.	<i>OK</i>	
Stationary contact bottles	<i>OK</i>	
Shutter and operator	<i>OK</i>	
Cell racking	<i>OK</i>	
Terminal, fuse blocks and fuses	<i>OK</i>	
Heaters	<i>EXTERNAL</i>	
Auxiliary control devices	<i>OK</i>	
Control wiring general condition	<i>OK</i>	
Pilot lights and instr. function	<i>OK</i>	
Brk., meter cont. sw., cell sw.	<i>OK</i>	
Cell heaters	<i>NONE</i>	No. Voltage
Key interlocks	<i>NONE</i>	Mfg. Key no.
Test position operation	<i>OK</i>	
C.B. operation by relays	<i>OK</i>	
Insulation resistance ① in megohms @ <i>5000</i> volts	A-B line <i>900</i> load <i>900</i> B-C line <i>600</i> load <i>600</i> C-A line <i>900</i> load <i>900</i>	A-Gnd. line <i>200</i> load <i>200</i> B-Gnd. line <i>250</i> load <i>250</i> G-Gnd. line <i>150</i> load <i>150</i>

Notes *① MAIN AND ALL FEEDER BREAKERS CLOSED,*

Westinghouse

Engineering Service

Seattle, Wa.

(206) 656-4380

TEST DATA SHEET



SWITCHGEAR INSPECTION AND TEST

Form SW2

Customer: <u>US DOE</u>	Location: <u>RICHLAND WA</u>	Job No.: <u>SEEG 403</u>
Bus I.D.: <u>BUS B</u>	Feeder I.D.: <u>MAIN #2</u>	S.N.:
Manufacturer: <u>C-H/WESTINGHOUSE</u>	Type: <u>VAC-CLAD</u>	
Voltage: <u>2400</u>	Bus Amps: <u>1200</u>	Structure Amps: <u>1200</u>
Engineer: <u>L.K. McFARLAND</u>		Date: <u>12-17-96</u>

	AS FOUND CONDITION	COMMENTS
Paint finish - inside & out	OK	
Alignment, leveling, anchoring	OK	
Hardware	OK	
Bus insulation	OK	
Corona/tracking	NONE	
Bus joint insulation	OK	
Bus or cable taping	OK	
Pothead/stress cones	NONE	
Bus supports	OK	
Ground bus and structure gnd.	OK	
Stationary contact bottles	OK	
Shutter and operator	OK	
Cell racking	OK	
Terminal, fuse blocks and fuses	OK	
Heaters	EXTERNAL	
Auxiliary control devices	OK	
Control wiring general condition	OK	
Pilot lights and instr. function	OK	
Brk., meter cont. sw., cell sw.	OK	
Cell heaters	NONE	No. Voltage
Key interlocks	NONE	Mfg. Key no.
Test position operation	OK	
C.B. operation by relays	OK	
Insulation resistance ① in megohms @ 5000 volts	A-B line 300 load 300 B-C line 400 load 400 C-A line 200 load 200	A-Gnd. line 90 load 90 B-Gnd. line 200 load 200 G-Gnd. line 150 load 150

Notes: ① MAIN AND ALL FEEDER BREAKERS CLOSED



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: 96076453
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 1U
Feeder: SPARE
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed:	A-G	>100,000	B-G	>100,000	C-G	>100,000
Breaker Closed:	A-B	>100,000	B-C	>100,000	C-A	>100,000
Breaker Open:	A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 500

Contact Resistance (Readings in Microohms): A 13 B 14 C 14

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00014 Operations End: 00018

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076546
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6816C40G11
IB Number: 32-255-1C

Cubicle Number: 1L
Feeder: MINI SUB (BUS 1)
Voltage Rating: 4.76 KV
Current Rating: 1200A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G > 100,000
Breaker Closed: A-B > 100,000
Breaker Open: A-A' N/A

B-G > 100,000
B-C > 100,000
B-B' N/A

C-G > 100,000
C-A > 100,000
C-C' N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 12 B 12 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00018 Operations End: 00022

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076485
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 2U
Feeder: SPARE
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C) : 18

Breaker Closed: A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Breaker Closed: A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microhms): A 12 B 11 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @:

40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00027 Operations End: 00031

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY

Location: RICHLAND WA

(W) Job No: SEEG403

Date: DECEMBER 13, 1996

Unique No: SERIAL 98076547

Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR

Switchgear designation: 2400 V SWITCHGEAR

Manufacturer: C-H / WESTINGHOUSE

Type: 50VCP-W350

Model / Style Number: 6616C40G11

IB Number: 32-255-1C

Cubicle Number: 2L

Feeder: MCC (BUS 1)

Voltage Rating: 4.76 KV

Current Rating: 1200 A

Interrupting Rating: 41KA

Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers:

A

Vac. Contact Wear Indicators:

A

Vac. Contact Wipe Indicators:

A

Clean Vac Bottles and Insulation:

A

Auxiliary Contacts:

A

Control Circuit Wiring:

A

Charging Motor Operation:

A

Clean and Lubricate Mechanism:

A

Racking and Shutter Mechanism:

A

Electrical Charge Test:

A

Electrical Close and Trip Test:

A

Relay Trip Tests:

A

CODE LEGEND

A = Like New Condition

D = Corrections Made

B = Good Condition - Correct Adjustments

E = Unacceptable Condition - Do Not Use!

C = Poor Condition - Requires Correction

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @:

5000

Volts DC

Ambient Temp (Degrees C) : 18

Breaker Closed: A-G > 100,000

B-G > 100,000

C-G > 100,000

Breaker Closed: A-B > 100,000

B-C > 100,000

C-A > 100,000

Breaker Open: A-A' N/A

B-B' N/A

C-C' N/A

Control Wiring (Tested at 500 VDC)

1000

Contact Resistance (Readings in Microhms):

A

11

B

11

C

12

HIPOT Across Open Vacuum

Interrupter Contacts for 1 minute @:

40 KVDC

Phase A

Phase B

Phase C

PASS

PASS

PASS

Operation Start: 00029

Operations End: 00034

COMMENTS:

1

2

3

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076548
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 4U
Feeder: FAN #1
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Breaker Closed: A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 12 B 13 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00027 Operations End: 00032

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US Department of Energy
Location: Richland WA
(W) Job No: SEEG403

Date: December 12, 1996
Unique No: Serial 96076489
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 VOLT SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 5U
Feeder: MAIN #1
Voltage Rating: 4.76 kV max
Current Rating: 1,200 A
Interrupting Rating: 41 kA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C) : 18

Breaker Closed: A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Breaker Closed: A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microhms): A 18 B 15 C 14

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @:

40 kVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00064 Operations End: 00068

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



WESTINGHOUSE ELECTRIC CORPORATION

ELECTRICAL SYSTEMS SERVICES

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MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076545
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 6L
Feeder: TIE
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Breaker Closed: A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microhms): A 12 B 12 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00013 Operations End: 00018

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY

Location: RICHLAND WA

(W) Job No: SEEG403

Date: DECEMBER 12, 1996

Unique No: SERIAL 96076452

Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR

Switchgear designation: 2400 V SWITCHGEAR

Manufacturer: C-H / WESTINGHOUSE

Type: 50VCP-W350

Model / Style Number: 6616C40G11

IB Number: 32-255-1C

Cubicle Number: 8U

Feeder: MAIN #2

Voltage Rating: 4.76 kV

Current Rating: 1200 A

Interrupting Rating: 41 kA

Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers:

Vac. Contact Wear Indicators:

Vac. Contact Wipe Indicators:

Clean Vac Bottles and Insulation:

Auxiliary Contacts:

Control Circuit Wiring:

Charging Motor Operation:

Clean and Lubricate Mechanism:

Racking and Shutter Mechanism:

Electrical Charge Test:

Electrical Close and Trip Test:

Relay Trip Tests:

CODE LEGEND

A = Like New Condition

D = Corrections Made

B = Good Condition - Correct Adjustments

E = Unacceptable Condition - Do Not Use!

C = Poor Condition - Requires Correction

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @:

5000

Volts DC

Ambient Temp (Degrees C) :

18

Breaker Closed: A-G >100,000

B-G >100,000

C-G >100,000

Breaker Closed: A-B >100,000

B-C >100,000

C-A >100,000

Breaker Open: A-A' N/A

B-B' N/A

C-C' N/A

Control Wiring (Tested at 500 VDC)

1000

Contact Resistance (Readings in Microohms):

A

15

B

18

C

14

HIPOT Across Open Vacuum

Interrupter Contacts for 1 minute @:

40 kVDC

Phase A

PASS

Phase B

PASS

Phase C

PASS

Operation Start: 00024

Operations End: 00028

COMMENTS:

1

2

3

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076451
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SUBSTATION
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 9U
Feeder: SPARE
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition

D = Corrections Made

B = Good Condition - Correct Adjustments

E = Unacceptable Condition - Do Not Use!

C = Poor Condition - Requires Correction

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G > 100,000
Breaker Closed: A-B > 100,000
Breaker Open: A-A' N/A

B-G > 100,000
B-C > 100,000
B-B' N/A

C-G > 100,000
C-A > 100,000
C-C' N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 13 B 14 C 14

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00019 Operations End: 00023

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076454
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 9L
Feeder: MINI SUB (BUS 2)
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G	>100,000	B-G	>100,000	C-G	>100,000
Breaker Closed: A-B	>100,000	B-C	>100,000	C-A	>100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 12 B 10 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @:

40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00023 Operations End: 00028

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076455
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 10U
Feeder: SPARE
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G	>100,000	B-G	>100,000	C-G	>100,000
Breaker Closed: A-B	>100,000	B-C	>100,000	C-A	>100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 13 B 12 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @:

40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00024 Operations End: 00028

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076484
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 10L
Feeder: MCC (BUS 2)
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G >100,000
Breaker Closed: A-B >100,000
Breaker Open: A-A' N/A

B-G >100,000
B-C >100,000
B-B' N/A

C-G >100,000
C-A >100,000
C-C' N/A

Control Wiring (Tested at 500 VDC) 500

Contact Resistance (Readings in Microohms): A 12 B 13 C 12

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00090 Operations End: 00095

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076571
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50 VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-2551C

Cubicle Number: 11U
Feeder: FAN #2
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C) : 18

Breaker Closed: A-G	>100,000	B-G	>100,000	C-G	>100,000
Breaker Closed: A-B	>100,000	B-C	>100,000	C-A	>100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microhms): A 12 B 11 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00006 Operations End: 00011

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC



MEDIUM VOLTAGE VACUUM CIRCUIT BREAKER

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND WA
(W) Job No: SEEG403

Date: DECEMBER 13, 1996
Unique No: SERIAL 96076486
Purchase Order:

NAMEPLATE AND SETTINGS

Substation: PUREX MAIN SWITCHGEAR
Switchgear designation: 2400 V SWITCHGEAR
Manufacturer: C-H / WESTINGHOUSE
Type: 50VCP-W350
Model / Style Number: 6616C40G11
IB Number: 32-255-1C

Cubicle Number: 11L
Feeder: FAN #3
Voltage Rating: 4.76 KV
Current Rating: 1200 A
Interrupting Rating: 41 KA
Trip Coil / Close Coil: 125 VDC

INSPECTION

Primary Fingers: A
Vac. Contact Wear Indicators: A
Vac. Contact Wipe Indicators: A
Clean Vac Bottles and Insulation: A
Auxiliary Contacts: A
Control Circuit Wiring: A

Charging Motor Operation: A
Clean and Lubricate Mechanism: A
Racking and Shutter Mechanism: A
Electrical Charge Test: A
Electrical Close and Trip Test: A
Relay Trip Tests: A

CODE LEGEND

A = Like New Condition	D = Corrections Made
B = Good Condition - Correct Adjustments	E = Unacceptable Condition - Do Not Use!
C = Poor Condition - Requires Correction	

ELECTRICAL TESTS

Insulation Resistance (Readings in Megohms) @: 5000 Volts DC Ambient Temp (Degrees C): 18

Breaker Closed: A-G	>100,000	B-G	>100,000	C-G	>100,000
Breaker Closed: A-B	>100,000	B-C	>100,000	C-A	>100,000
Breaker Open: A-A'	N/A	B-B'	N/A	C-C'	N/A

Control Wiring (Tested at 500 VDC) 1000

Contact Resistance (Readings in Microohms): A 11 B 10 C 11

HIPOT Across Open Vacuum
Interrupter Contacts for 1 minute @: 40 KVDC

Phase A	Phase B	Phase C
PASS	PASS	PASS

Operation Start: 00014 Operations End: 00019

COMMENTS:

1	
2	
3	

Tested By: L.K. MCFARLAND

Form No: 2.0510.1

BKR_MV_VAC

RELAY TEST
AND SETTINGS

CALIBRATION CHECK **2** **POINTS REQUIRED**

FILE NO. 2-171-00-990 REV G

BASLER BEL-32R POWER RELAY
STYLE CIE DIP AON IF

ELECTRIC SERVICE DIVISION

PUREX PROJECT

JOB NO.

SEEG 403

[illegible]

REMARKS:

A-10 SETTING $\Rightarrow$ 1.5 WATTS (SECONDARY)

TEST REPORT

OVERVOLTAGE OR UNDERVOLTAGE RELAY
IL NO. 2-1704-00-990 REV D

COMPLETE NAMEPLATE DATA

EASIER BEL-47N VOLT PHASE SEQUENCE
STYLE E3E DIP AONIF
NOMINAL VOLTAGE = 120

ELECTRIC SERVICE DIVISION

PUREX PROJECT

JOB NO.

SEEG 403

POINTS TO BE TESTED

2

SETTINGS

RELAY TESTS

LOCATION	SERIAL NO.	STYLE NO.	TAP VOLTS	TIME DIAL	PICK-UP VOLTS	200 %	400 %	%	%	%	TARGET OPER. AMPS DC	INSUL. TEST MEGOHMS
MAIN # 1		E3E DIP AONIF	C	02	12.4	1.22	0.67				<0.2	
MAIN # 2			C	02	12.3	1.22	0.66				<0.2	
1A - SPARE			B	01	8.3	0.65	0.36				<0.2	
1B - MINI SUB			B	01	8.3	0.64	0.36				<0.2	
2B - MCC			B	01	8.3	0.65	0.37				<0.2	
3A - FUTURE			B	01	8.3	0.64	0.37				<0.2	
9B - MINI SUB			B	01	8.3	0.64	0.36				<0.2	
10B - MCC		✓	B	01	8.3	0.65	0.36				<0.2	

REMARKS

CALCULATED PICK-UP VOLTS (SINGLE PHASE TEST)

SETTING B = 8.31 V $\pm 5\%$ SETTING C = 12.47 $\pm 5\%$

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT

CUSTOMER: US DEPARTMENT OF ENERGY
LOCATION: HANFORD WA

(W) JOB NO: SEEG403
DATE: 1-7-97

FEEDER: 1A SPARE
SERIAL: A2760717

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0	7.5	10.0					
RELAY OUTPUTS				RELAY OUT (units)		498.5	718.0	994.0					
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS			TESTED	INPUT (Volts)	P.T. MULT.	CALC. (Volts)	RELAY (Volts)
	A	1.67	120	200	200				A-B	120	20	2400	240.0
	B	1.67	120	200	200				B-C	120	20	2400	240.0
	C	1.67	120	200	200				C-A	120	20	2400	240.0
	N	1.67	120	200	200				A-N	69.3	20	1386	138.0
	G	1	10	10	10				B-N	69.3	20	1386	138.0
POWER METERING TESTS	PHASE-ANGLE (Degrees)	INPUT FREQ. (Hz)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIV. POWER (MVAR)	CALC. APPAR. POWER (MVA)	REAL POWER (MW)	REACTIV. POWER (MVAR)	APPAR. POWER (MVA)	FREQ. (Hz)			
	120	4.0	60	0	1.00	0.0	2.0	0.0	2.0	60.0			
	120	2.0	60	0	1.00	0.0	1.0	0.0	1.0	60.0			
	120	2.0	60	90	0.00	0.0	1.0	0.0	1.0	60.0			
	120	4.0	60	45	0.71	1.4	1.4	1.4	1.4	60.0			
	120	4.0	60	3	3	4	5	10	10	60.0			
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	CURRENT PHASE A	3.7	60	75	84	90	99					
	CURRENT PHASE B	3.7	60	75	84	90	99						
	CURRENT PHASE C	3.7	60	75	84	90	99						
	REAL POWER	3.7	60	75	84	90	99						
	REACTIVE POWER	3.7	60	75	84	90	99						
	APPARENT POWER	3.7	60	75	84	90	99						
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	CURRENT PHASE A	0	0	0	0	100	100					
	CURRENT PHASE B	0	0	0	0	0	100	100					
	CURRENT PHASE C	0	0	0	0	0	100	100					
	REAL POWER	0	0	0	0	0	100	100					
	REACTIVE POWER	0	0	0	0	0	100	100					
	APPARENT POWER	0	0	0	0	0	100	100					

TESTED BY: LKM

COMMENTS:

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 1A SPARE

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	40	60	80	100
	CURRENT PHASE B	20	40	60	80	100
	CURRENT PHASE C	20	40	60	80	100
	REAL POWER	20	40	60	80	100
	REACTIVE POWER	20	40	60	80	100
	APPARENT POWER	20	40	60	80	100

CUSTOMER: US DEPARTMENT OF ENERGY
 LOCATION: HANFORD WA
 SR 750 RELAY TEST REPORT
 (W) JOB NO: SEEG403
 DATE: 1-8-97
 FEEDER: 1B MINI SUB BRR
 SERIAL: 42760713

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0	7.5	10.0					
RELAY OUTPUTS				RELAY OUT (units)		4990	7480	10000					
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	G.T. RATIO MULT.	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE TESTS			PHASES TESTED	INPUT (Volts)	P.T. MULT.	CALC. (Volts)	RELAY (Volts)
	A	1.67	120	200	200				A-B	120	20	2400	2400
	B	1.67	120	200	200				B-C	120	20	2400	2400
	C	1.67	120	200	200				C-A	120	20	2400	2400
	N	1.67	120	200	200				A-N	69.3	20	1386	1386
	G	1	10	10	10	10				B-N	69.3	20	1386
POWER METERING TESTS	PHASE- PHASE (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIV. POWER (MVAR)	CALC. APPAR. POWER (MVA)	REAL POWER (MW)	REACTIV. POWER (MVAR)	APPAR. POWER (MVA)	FREQ. (Hz)	
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	0.0	2.0	60.1	
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	0.0	1.0	60.1	
	120	2.0	60	90	0.00	0.0	1.0	1.0	0.0	1.0	1.0	60.0	
	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	1.4	2.0	60.0	
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	1	2	3	4	5	10						
	CURRENT PHASE A	37	60	75	84	90	99						
	CURRENT PHASE B	37	60	75	84	90	99						
	CURRENT PHASE C	37	60	75	84	90	99						
	REAL POWER	37	60	75	84	90	99						
	REACTIVE POWER	37	60	75	84	90	99						
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	APPARENT POWER <td>37</td> <td>60</td> <td>75</td> <td>84</td> <td>90</td> <td>99</td> <td colspan="6"></td>	37	60	75	84	90	99						
	TIME (minutes)	1	2	3	4	5	6						
	CURRENT PHASE A	0	0	0	0	100	100						
	CURRENT PHASE B	0	0	0	0	100	100						
	CURRENT PHASE C	0	0	0	0	100	100						
	REAL POWER	0	0	0	0	100	100						
		REACTIVE POWER	0	0	0	0	100	100					
		APPARENT POWER	0	0	0	0	100	100					
TESTED BY: LKM													
COMMENTS:													

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 113 MINI SUB BKR

TIME (minutes)	1	2	3	4	5	6
CURRENT PHASE A	20	40	60	80	100	100
CURRENT PHASE B	20	40	60	80	100	100
CURRENT PHASE C	20	40	60	80	100	100
REAL POWER	20	40	60	80	100	100
REACTIVE POWER	20	40	60	80	100	100
APPARENT POWER	20	40	60	80	100	100

ROLLING
DEMAND TESTS
(Demand values
in percent of input)

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT

CUSTOMER: US DEPARTMENT OF ENERGY
LOCATION: HANFORD WA

(W) JOB NO: SEEG403
DATE: 1-8-97

FEEDER: 2B MCC BKR
SERIAL: A2760712

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0				
RELAY OUTPUTS		OK		RELAY OUT (units)		498.5		7480		9930				
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO MULT.	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS								
	A	1.67	120	200	200									
	B	1.67	120	200	200									
	C	1.67	120	200	200									
	N	1.67	120	200	200									
	G	1	10	10	10									
POWER METERING TESTS	PHASE- PHASE (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIVE POWER (MVAR)	CALC. APPAR. POWER (MVA)	PHASES TESTED	PHASES A-B	PHASES B-C	PHASES A-N	PHASES B-N	PHASES C-N
	120	4.0	60	0	1.00	2.0	0.0	2.0	A-B	20	20	20	20	20
	120	2.0	60	0	1.00	1.0	0.0	1.0	B-C	20	20	20	20	20
	120	2.0	60	90	0.00	0.0	1.0	1.0	A-N	20	20	20	20	20
	120	4.0	60	45	0.71	1.4	1.4	2.0	B-N	20	20	20	20	20
									C-N	20	20	20	20	20
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	1	2	3	4	5	10	TESTED BY: <i>ZZM</i> COMMENTS:						
	CURRENT PHASE A	37	60	75	84	90	99							
	CURRENT PHASE B	37	60	75	84	90	99							
	CURRENT PHASE C	37	60	75	84	90	99							
	REAL POWER	37	60	75	84	90	99							
	REACTIVE POWER	37	60	75	84	90	99							
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	1	2	3	4	5	6	TESTED BY: <i>ZZM</i> COMMENTS:						
	CURRENT PHASE A	0	0	0	0	100	100							
	CURRENT PHASE B	0	0	0	0	100	100							
	CURRENT PHASE C	0	0	0	0	100	100							
	REAL POWER	0	0	0	0	100	100							
	REACTIVE POWER	0	0	0	0	100	100							

SR 750 RELAY TEST REPORT (continued)

FEEDER: 2B MCC BKR

ROLLING
DEMAND TESTS
(Demand values
in percent of input)

WESTINGHOUSE ELECTRIC COMPANY

CUSTOMER: US DEPARTMENT OF ENERGY
 LOCATION: HANFORD WA
 SR 750 RELAY TEST REPORT
 (W) JOB NO: SEEG403
 DATE: 1-8-97
 FEEDER: 3A FUTURE
 SERIAL: A2760115

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0		
RELAY OUTPUTS				RELAY OUT (units)		4980		7460		9950		
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS						
	A	1.67	120	200	200							
	B	1.67	120	200	200							
	C	1.67	120	200	200							
	N	1.67	120	200	200							
	G	1	10	10	10							
POWER METERING TESTS	PHASE- (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. POWER (MW)	CALC. REACTIV. POWER (MVAR)	CALC. APPAR. POWER (MVA)	REAL POWER (MW)	REACTIV. POWER (MVAR)	RELAY READINGS POWER (MVA)	
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	0.0	2.0	
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	0.0	1.0	
	120	2.0	60	90	0.00	0.0	1.0	1.0	0.0	1.0	1.0	
	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	1.4	2.0	
	RELAY READINGS											
	FREQ. (Hz)											
	FREQ. (Hz)											
	FREQ. (Hz)											
	FREQ. (Hz)											
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	1	2	3	4	5	10	TESTED BY: LKM COMMENTS:				
	CURRENT PHASE A	37	60	75	84	90	99					
	CURRENT PHASE B	37	60	75	84	90	99					
	CURRENT PHASE C	37	60	75	84	90	99					
	REAL POWER	37	60	75	84	90	99					
	REACTIVE POWER	37	60	75	84	90	99					
	APPARENT POWER	37	60	75	84	90	99					
	TIME (minutes)	1	2	3	4	5	6					
	CURRENT PHASE A	0	0	0	0	100	100					
	CURRENT PHASE B	0	0	0	0	100	100					
CURRENT PHASE C	0	0	0	0	100	100						
REAL POWER	0	0	0	0	100	100						
REACTIVE POWER	0	0	0	0	100	100						
APPARENT POWER	0	0	0	0	100	100						

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 3A FUTURE

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	40	60	80	100
	CURRENT PHASE B	20	40	60	80	100
	CURRENT PHASE C	20	40	60	80	100
	REAL POWER	20	40	60	80	100
	REACTIVE POWER	20	40	60	80	100
	APPARENT POWER	20	40	60	80	100

WESTINGHOUSE ELECTRIC COMPANY

CUSTOMER: US DEPARTMENT OF ENERGY
 LOCATION: HANFORD, WA
 SR 750 RELAY TEST REPORT
 (W) JOB NO: SEEG403
 DATE: 1-7-97
 FEEDER: SA MAIN #1
 SERIAL: A2760714

LOGIC INPUTS		OK		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0							
RELAY OUTPUTS		OK				RELAY OUT (units)		4942		7440		9246							
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS								PHASES TESTED		INPUT (Volts)	P.T. MULT.	CALC. (Volts)	RELAY (Volts)
	A	1.67	120	200	200									A-B		120	20	2400	2400
	B	1.67	120	200	200									B-C		120	20	2400	2400
	C	1.67	120	200	200									C-A		120	20	2400	2400
	N	1.67	120	200	200									A-N		69.3	20	1386	1386
	G	1	10	10	10									B-N		69.3	20	1386	1386
POWER METERING TESTS	PHASE- (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIVE POWER (MVAR)	CALC. APPAR. POWER (MVA)	REAL POWER (MW)	REACTIVE POWER (MVAR)	RELAY READINGS	FREQ. (Hz)							
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	0.0	2.0	60.0							
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	0.0	1.0	60.0							
	120	2.0	60	90	0.00	0.0	1.0	1.0	0.1	1.0	1.0	60.0							
	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	1.4	2.0	60.0							
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)	1	2	3	4	5	6	10											
	CURRENT PHASE A	37	60	75	84	90	99	99											
	CURRENT PHASE B	37	60	75	84	90	99	99											
	CURRENT PHASE C	37	60	75	84	90	99	99											
	REAL POWER	37	60	75	84	90	99	99											
	REACTIVE POWER	37	60	75	84	90	99	99											
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	APPARENT POWER	37	60	75	84	90	99	99											
	TIME (minutes)	1	2	3	4	5	6	10											
	CURRENT PHASE A	0	0	0	0	0	0	0											
	CURRENT PHASE B	0	0	0	0	0	0	0											
	CURRENT PHASE C	0	0	0	0	0	0	0											
	REAL POWER	0	0	0	0	0	0	0											
	REACTIVE POWER	0	0	0	0	0	0	0											
TESTED BY: LKM																			
COMMENTS:																			

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: SA MAIN / # 1

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	40	60	80	100
	CURRENT PHASE B	20	40	60	80	100
	CURRENT PHASE C	20	40	60	80	100
	REAL POWER	20	40	60	80	100
	REACTIVE POWER	20	40	60	80	100
	APPARENT POWER	20	40	60	80	100

WESTINGHOUSE ELECTRIC COMPANY

CUSTOMER: US DEPARTMENT OF ENERGY
LOCATION: HANFORD WA

SR 750 RELAY TEST REPORT
(W) JOB NO: SEEG403
DATE: 1-7-97

FEEDER: 3A MAIN #2
SERIAL: A2760716

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0	
RELAY OUTPUTS				RELAY OUT (units)							
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS					
	A	1.67	120	200	200						
	B	1.67	120	200	200						
	C	1.67	120	200	200						
	N	1.67	120	200	200						
	G	1	10	10	10						
POWER METERING TESTS	PHASE- VOLTAGE (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. POWER (MW)	CALC. REACTIVE POWER (MVAR)	CALC. APPAR. POWER (MVA)	REL. POWER (MW)	REACTIVE POWER (MVAR)	RELAY READINGS: POWER (MVA)
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	0.0	2.0
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	0.0	1.0
	120	2.0	60	90	0.00	0.0	0.0	1.0	0.0	1.0	1.0
	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	1.4	2.0
	TIME (minutes)										
	CURRENT PHASE A	37	60	75	84	90	99				
	CURRENT PHASE B	37	60	75	84	90	99				
	CURRENT PHASE C	37	60	75	84	90	99				
	REAL POWER (Demand values in percent of input)	37	60	75	84	90	99				
REACTIVE POWER	37	60	75	84	90	99					
APPARENT POWER	37	60	75	84	90	99					
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	TIME (minutes)										
	CURRENT PHASE A	0	0	0	0	0	0	100	100	100	100
	CURRENT PHASE B	0	0	0	0	0	0	100	100	100	100
	CURRENT PHASE C	0	0	0	0	0	0	100	100	100	100
	REAL POWER	0	0	0	0	0	0	100	100	100	100
	REACTIVE POWER	0	0	0	0	0	0	100	100	100	100
APPARENT POWER	0	0	0	0	0	0	100	100	100	100	

TESTED BY: LKM

COMMENTS:

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 2A MAIN #2

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	60	80	100	100
	CURRENT PHASE B	20	60	80	100	100
	CURRENT PHASE C	20	60	80	100	100
	REAL POWER	20	60	80	100	100
	REACTIVE POWER	20	60	80	100	100
	APPARENT POWER	20	60	80	100	100

WESTINGHOUSE ELECTRIC COMPANY

CUSTOMER: US DEPARTMENT OF ENERGY
 LOCATION: HANFORD WA
 SR 750 RELAY TEST REPORT
 (W) JOB NO: SEEG403
 DATE: 1-8-97
 FEEDER: 9B MINI SUB
 SERIAL: A2760710

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0			
RELAY OUTPUTS		O.K.		O.K.		4260		7470		9240			
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	RELAY READING (Amperes)	CALC. CURRENT (Amperes)	VOLTAGE METERING TESTS							
	A	1.67	120	200	200								
	B	1.67	120	200	200								
	C	1.67	120	200	200								
	N	1.67	120	200	200								
	G	1	10	10	10								
POWER METERING TESTS	PHASE- PHASE (Volts)	INPUT CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIV. POWER (MVAR)	CALC. APPAR. POWER (MVA)	RELAY READINGS	REAL POWER (MW)	REACTIV. POWER (MVAR)	APPAR. POWER (MVA)	FREQ. (Hz)
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	2.0	0.0	2.0	60.1
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	1.0	0.0	1.0	60.1
	120	2.0	60	90	0.00	0.0	1.0	1.0	0.0	1.0	1.0	1.0	60.1
	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	1.4	1.4	2.0	60.1
	TIME (minutes)												
	CURRENT PHASE A	37	60	75	84	4	5	10					
	CURRENT PHASE B	37	60	75	84	4	5	10					
	CURRENT PHASE C	37	60	75	84	4	5	10					
	REAL POWER (Demand values in percent of input)	37	60	75	84	4	5	10					
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	REACTIVE POWER	37	60	75	84	4	5	10					
	APPARENT POWER	37	60	75	84	4	5	10					
	TIME (minutes)												
	CURRENT PHASE A	0	0	0	0	0	0	0	0				
	CURRENT PHASE B	0	0	0	0	0	0	0	0				
	CURRENT PHASE C	0	0	0	0	0	0	0	0				
REAL POWER (Demand values in percent of input)	0	0	0	0	0	0	0	0					
REACTIVE POWER	0	0	0	0	0	0	0	0					
APPARENT POWER	0	0	0	0	0	0	0	0					

TESTED BY: *PRM*

COMMENTS:

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 3B MINI SUB

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	40	20	20	100
	CURRENT PHASE B	20	40	20	20	100
	CURRENT PHASE C	20	40	20	20	100
	REAL POWER	20	40	20	20	100
REACTIVE POWER	20	40	20	20	20	100
	APPARENT POWER	20	40	20	20	100

WESTINGHOUSE ELECTRIC COMPANY

CUSTOMER: US DEPARTMENT OF ENERGY
 LOCATION: HANFORD WA
 SR 750 RELAY TEST REPORT
 (W) JOB NO: SEE3403
 DATE: 1-8-97
 FEEDER: 10 B MLC
 SERIAL: 42760711

LOGIC INPUTS		ANALOG INPUT		INPUT (ma)		5.0		7.5		10.0		
RELAY OUTPUTS		RELAY		RELAY OUT (units)		4980		7450		9930		
CURRENT METERING TESTS	PHASE UNDER TEST	INPUT CURRENT (Amperes)	C.T. RATIO	CALC. CURRENT (Amperes)	RELAY READING (Amperes)	VOLTAGE METERING TESTS						
	A	1.67	120	200	200							
	B	1.67	120	200	200							
	C	1.67	120	200	200							
	N	1.67	120	200	200							
POWER METERING TESTS	G	1	10	10	10							
	PHASE- VOLTAGE (Volts)	PHASE CURRENT (Amperes)	INPUT FREQ. (Hz)	PHASE ANGLE (Degrees)	CALC. POWER FACTOR	CALC. REAL POWER (MW)	CALC. REACTIVE POWER (MVAR)	CALC. APPAR. POWER (MVA)	INPUT POWER (MW)	P.T. MULT.	GALG. (Volts)	RELAY (Volts)
	120	4.0	60	0	1.00	2.0	0.0	2.0	2.0	20	2400	2400
	120	2.0	60	0	1.00	1.0	0.0	1.0	1.0	20	2400	2400
	120	2.0	60	90	0.00	0.0	1.0	1.0	0.0	20	2400	2400
THERMAL EXPONENTIAL DEMAND TESTS (Demand values in percent of input)	120	4.0	60	45	0.71	1.4	1.4	2.0	1.4	20	1386	1380
	TIME (minutes)	1	2	3	4	5	10					
	CURRENT PHASE A	37	60	75	84	90	99					
	CURRENT PHASE B	37	60	75	84	90	99					
	CURRENT PHASE C	37	60	75	84	90	99					
BLOCK INTERVAL DEMAND TESTS (Demand values in percent of input)	REAL POWER	37	60	75	84	90	99					
	REACTIVE POWER	37	60	75	84	90	99					
	APPARENT POWER	37	60	75	84	90	99					
	TIME (minutes)	1	2	3	4	5	10					
	CURRENT PHASE A	0	0	0	0	100	100					
CURRENT PHASE B	0	0	0	0	100	100						
CURRENT PHASE C	0	0	0	0	100	100						
REAL POWER	0	0	0	0	100	100						
REACTIVE POWER	0	0	0	0	100	100						
APPARENT POWER	0	0	0	0	100	100						

TESTED BY: ZKM

COMMENTS:

WESTINGHOUSE ELECTRIC COMPANY

SR 750 RELAY TEST REPORT (continued)

FEEDER: 10B MCC

ROLLING DEMAND TESTS (Demand values in percent of input)	TIME (minutes)					
	1	2	3	4	5	6
	CURRENT PHASE A	20	40	60	80	100
	CURRENT PHASE B	20	40	60	80	100
	CURRENT PHASE C	20	40	60	80	100
	REAL POWER	20	40	60	80	100
REACTIVE POWER	20	40	60	80	100	100
	20	40	60	80	100	100
APPARENT POWER	20	40	60	80	100	100

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:41

RELAY SETUP

PASSCODE

Available From Front Panel Only

PREFERENCES

Beeper	ENABLED
Flash Message Time	4.0 s
Default Message Timeout	300 s
Default Message Intensity	25 %

COMMUNICATIONS

Slave Address	254
COM1 Baud Rate	9600
COM1 Parity	NONE
COM1 Communication Hardware	RS485
COM2 Baud Rate	9600
COM2 Parity	NONE

CLOCK

Date : Month	Jan
Day	23
Year	1997
Time : Hour	9
Minute	37
Second	0.000

EVENT RECORDER SETUP

Event Recorder Function	ENABLED
Recording of Pickup Events	ENABLED
Recording of Trip Events	ENABLED
Recording of Alarm Events	ENABLED
Recording of Control Events	DISABLED
Recording of Dropout Events	ENABLED
Recording of Logic Input Events	ENABLED

SELECTED DEFAULT MESSAGES

Available From Front Panel Only

USER TEXT DEFAULT MESSAGES

Message 1 line 1	Text 1
line 2	
Message 2 line 1	Text 2
line 2	
Message 3 line 1	Text 3
line 2	
Message 4 line 1	Text 4

line 2
Message 5 line 1
line 2

Text 5

INSTALLATION
SR750 Operation

READY

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:42

SYSTEM SETUP

CURRENT SENSING

Phase CT Primary	600 A
Ground CT Primary	50 A
Polarizing CT Primary	200 A

BUS VOLTAGE SENSING

Bus VT Connection Type	DELTA
Bus Nominal VT Secondary Voltage	120.0 V
Bus VT Ratio	20:1

LINE VOLTAGE SENSING

Line VT Connection Type	VAN
Line Nominal VT Secondary Voltage	69.3 V
Line VT Ratio	20:1

POWER SYSTEM

Nominal Frequency	60 Hz
Cost of Energy	4.0 /kWh

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:42

LOGIC INPUTS

LOGIC INPUT 1	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 2	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 3	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 4	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 5	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 6	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 7	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 8	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 9	
State Logic	CONTACT ONLY
Asserted Contact State	OPEN
LOGIC INPUT 10	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 11	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED

LOGIC INPUT 12

State Logic

Asserted Contact State

CONTACT ONLY

CLOSED

LOGIC INPUT 13

State Logic

Asserted Contact State

CONTACT ONLY

CLOSED

LOGIC INPUT 14

State Logic

Asserted Contact State

CONTACT ONLY

CLOSED

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:42

USER INPUTS

BREAKER FUNCTIONS

52a Contact	DISABLED
52b Contact	DISABLED
Breaker Connected	DISABLED

CONTROL FUNCTIONS

Local Mode	INPUT 9
Remote Reset	DISABLED
Remote Open	DISABLED
Remote Close	DISABLED
Cold Load Pickup	DISABLED

USER INPUT 1

User Input 1 Name	User Input 1
User Input 1	DISABLED
User Input 1 Function	DISABLED
User Input 1 Relays (3-7)	-----
User Input 1 Delay	0.00 s

USER INPUT 2

User Input 2 Name	User Input 2
User Input 2	DISABLED
User Input 2 Function	DISABLED
User Input 2 Relays (3-7)	-----
User Input 2 Delay	0.00 s

USER INPUT 3

User Input 3 Name	User Input 3
User Input 3	DISABLED
User Input 3 Function	DISABLED
User Input 3 Relays (3-7)	-----
User Input 3 Delay	0.00 s

USER INPUT 4

User Input 4 Name	User Input 4
User Input 4	DISABLED
User Input 4 Function	DISABLED
User Input 4 Relays (3-7)	-----
User Input 4 Delay	0.00 s

USER INPUT 5

User Input 5 Name	User Input 5
User Input 5	DISABLED

User Input 5 Function	DISABLED
User Input 5 Relays (3-7)	-----
User Input 5 Delay	0.00 s

USER INPUT 6	
User Input 6 Name	User Input 6
User Input 6 Function	DISABLED
User Input 6 Relays (3-7)	DISABLED
User Input 6 Delay	-----
	0.00 s

USER INPUT 7	
User Input 7 Name	User Input 7
User Input 7 Function	DISABLED
User Input 7 Relays (3-7)	DISABLED
User Input 7 Delay	-----
	0.00 s

USER INPUT 8	
User Input 8 Name	User Input 8
User Input 8 Function	DISABLED
User Input 8 Relays (3-7)	DISABLED
User Input 8 Delay	-----
	0.00 s

BLOCKING FUNCTIONS	
Block 1 TRIP Relay	DISABLED
Block 2 CLOSE Relay	DISABLED
Block Reset	DISABLED
Block Undervoltage 1	DISABLED
Block Undervoltage 2	DISABLED
Block Undervoltage 3	DISABLED
Block Undervoltage 4	DISABLED
Block Underfrequency 1	DISABLED
Block Underfrequency 2	DISABLED
Bypass Synchrocheck	DISABLED
Block Trip Counters	DISABLED

OVERCURRENT BLOCKING FUNCTIONS	
Block All Overcurrent	DISABLED
Block Phase Overcurrent	DISABLED
Block Ground Overcurrent	DISABLED
Block Neutral Overcurrent	DISABLED
Block Phase Time O/C	DISABLED
Block Phase Loset O/C	DISABLED
Block Phase Hiset O/C	DISABLED
Block Ground Time O/C	DISABLED
Block Ground Loset O/C	DISABLED
Block Ground Hiset O/C	DISABLED
Block Neutral Time O/C	DISABLED
Block Neutral Loset O/C	DISABLED
Block Neutral Hiset O/C	DISABLED

TRANSFER FUNCTIONS	
Selected To Trip	DISABLED
Undervoltage On Other Source	DISABLED
Incomer 1 Breaker Closed	DISABLED

Incomer 2 Breaker Closed
Tie Breaker Connected
Tie Breaker Closed
Block Transfer
Transformer Lockout
Source Trip
Close From Incomer 1
Close From Incomer 2

DISABLED
DISABLED
DISABLED
DISABLED
DISABLED
DISABLED
DISABLED
DISABLED

MISCELLANEOUS FUNCTIONS

Trigger Trace Memory
Simulate Fault

DISABLED
DISABLED

Type: SR750
Revision: Fl.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:43

OUTPUT RELAYS

1 TRIP	
Relay 1 Name	TRIP
Relay 1 Non-Operated State	DE ENERGIZED
Relay 1 Output Type	FEEDBACK CONTROL
2 CLOSE	
Relay 2 Name	CLOSE
Relay 2 Non-Operated State	DE-ENERGIZED
Relay 2 Output Type	FEEDBACK CONTROL
3 ALARM	
Relay 3 Name	LINE UNDERVOLT
Relay 3 Non-Operated State	DE-ENERGIZED
Relay 3 Output Type	LATCHED
4 AUXILIARY	
Relay 4 Name	INSTANTANEOUS
Relay 4 Non-Operated State	DE-ENERGIZED
Relay 4 Output Type	LATCHED
5 AUXILIARY	
Relay 5 Name	GROUND FAULT
Relay 5 Non-Operated State	DE-ENERGIZED
Relay 5 Output Type	LATCHED
6 AUXILIARY	
Relay 6 Name	AUXILIARY
Relay 6 Non-Operated State	DE-ENERGIZED
Relay 6 Output Type	SELF-RESETTING
7 AUXILIARY	
Relay 7 Name	AUXILIARY
Relay 7 Non-Operated State	DE-ENERGIZED
Relay 7 Output Type	SELF-RESETTING
8 SERVICE	
Relay 8 Name	SERVICE
Relay 8 Non-Operated State	ENERGIZED
Relay 8 Output Type	SELF-RESETTING

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:43

CURVES 1-6

CURVE 1

Curve 1 Pickup	1.00 x CT
Curve 1 Shape	IEC CURVE C
Curve 1 Multiplier	1.0
Curve 1 Multiplier (for IEC)	1.00
Curve 1 Reset Time	INSTANTANEOUS

CURVE 2

Curve 2 Pickup	0.28 x CT
Curve 2 Shape	IEC CURVE B
Curve 2 Multiplier	0.7
Curve 2 Multiplier (for IEC)	0.71
Curve 2 Reset Time	INSTANTANEOUS

CURVE 3

Curve 3 Pickup	0.85 x CT
Curve 3 Shape	EXTREMELY INVERSE
Curve 3 Multiplier	1.0
Curve 3 Multiplier (for IEC)	0.05
Curve 3 Reset Time	INSTANTANEOUS

CURVE 4

Curve 4 Pickup	0.85 x CT
Curve 4 Shape	EXTREMELY INVERSE
Curve 4 Multiplier	1.0
Curve 4 Multiplier (for IEC)	0.05
Curve 4 Reset Time	INSTANTANEOUS

CURVE 5

Curve 5 Pickup	0.85 x CT
Curve 5 Shape	EXTREMELY INVERSE
Curve 5 Multiplier	1.0
Curve 5 Multiplier (for IEC)	0.05
Curve 5 Reset Time	INSTANTANEOUS

CURVE 6

Curve 6 Pickup	0.85 x CT
Curve 6 Shape	EXTREMELY INVERSE
Curve 6 Multiplier	1.0
Curve 6 Multiplier (for IEC)	0.05
Curve 6 Reset Time	INSTANTANEOUS

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FLEXCURVE A

FLEXCURVE A

Curve A Trip Time At 1.03 x PU	0 ms
Curve A Trip Time At 1.05 x PU	0 ms
Curve A Trip Time At 1.1 x PU	0 ms
Curve A Trip Time At 1.2 x PU	0 ms
Curve A Trip Time At 1.3 x PU	0 ms
Curve A Trip Time At 1.4 x PU	0 ms
Curve A Trip Time At 1.5 x PU	0 ms
Curve A Trip Time At 1.6 x PU	0 ms
Curve A Trip Time At 1.7 x PU	0 ms
Curve A Trip Time At 1.8 x PU	0 ms
Curve A Trip Time At 1.9 x PU	0 ms
Curve A Trip Time At 2.0 x PU	0 ms
Curve A Trip Time At 2.1 x PU	0 ms
Curve A Trip Time At 2.2 x PU	0 ms
Curve A Trip Time At 2.3 x PU	0 ms
Curve A Trip Time At 2.4 x PU	0 ms
Curve A Trip Time At 2.5 x PU	0 ms
Curve A Trip Time At 2.6 x PU	0 ms
Curve A Trip Time At 2.7 x PU	0 ms
Curve A Trip Time At 2.8 x PU	0 ms
Curve A Trip Time At 2.9 x PU	0 ms
Curve A Trip Time At 3.0 x PU	0 ms
Curve A Trip Time At 3.1 x PU	0 ms
Curve A Trip Time At 3.2 x PU	0 ms
Curve A Trip Time At 3.3 x PU	0 ms
Curve A Trip Time At 3.4 x PU	0 ms
Curve A Trip Time At 3.5 x PU	0 ms
Curve A Trip Time At 3.6 x PU	0 ms
Curve A Trip Time At 3.7 x PU	0 ms
Curve A Trip Time At 3.8 x PU	0 ms
Curve A Trip Time At 3.9 x PU	0 ms
Curve A Trip Time At 4.0 x PU	0 ms
Curve A Trip Time At 4.1 x PU	0 ms
Curve A Trip Time At 4.2 x PU	0 ms
Curve A Trip Time At 4.3 x PU	0 ms
Curve A Trip Time At 4.4 x PU	0 ms
Curve A Trip Time At 4.5 x PU	0 ms
Curve A Trip Time At 4.6 x PU	0 ms
Curve A Trip Time At 4.7 x PU	0 ms
Curve A Trip Time At 4.8 x PU	0 ms
Curve A Trip Time At 4.9 x PU	0 ms
Curve A Trip Time At 5.0 x PU	0 ms

Curve A Trip Time At 5.1 x PU	0 ms
Curve A Trip Time At 5.2 x PU	0 ms
Curve A Trip Time At 5.3 x PU	0 ms
Curve A Trip Time At 5.4 x PU	0 ms
Curve A Trip Time At 5.5 x PU	0 ms
Curve A Trip Time At 5.6 x PU	0 ms
Curve A Trip Time At 5.7 x PU	0 ms
Curve A Trip Time At 5.8 x PU	0 ms
Curve A Trip Time At 5.9 x PU	0 ms
Curve A Trip Time At 6.0 x PU	0 ms
Curve A Trip Time At 6.5 x PU	0 ms
Curve A Trip Time At 7.0 x PU	0 ms
Curve A Trip Time At 7.5 x PU	0 ms
Curve A Trip Time At 8.0 x PU	0 ms
Curve A Trip Time At 8.5 x PU	0 ms
Curve A Trip Time At 9.0 x PU	0 ms
Curve A Trip Time At 9.5 x PU	0 ms
Curve A Trip Time At 10.0 x PU	0 ms
Curve A Trip Time At 10.5 x PU	0 ms
Curve A Trip Time At 11.0 x PU	0 ms
Curve A Trip Time At 11.5 x PU	0 ms
Curve A Trip Time At 12.0 x PU	0 ms
Curve A Trip Time At 12.5 x PU	0 ms
Curve A Trip Time At 13.0 x PU	0 ms
Curve A Trip Time At 13.5 x PU	0 ms
Curve A Trip Time At 14.0 x PU	0 ms
Curve A Trip Time At 14.5 x PU	0 ms
Curve A Trip Time At 15.0 x PU	0 ms
Curve A Trip Time At 15.5 x PU	0 ms
Curve A Trip Time At 16.0 x PU	0 ms
Curve A Trip Time At 16.5 x PU	0 ms
Curve A Trip Time At 17.0 x PU	0 ms
Curve A Trip Time At 17.5 x PU	0 ms
Curve A Trip Time At 18.0 x PU	0 ms
Curve A Trip Time At 18.5 x PU	0 ms
Curve A Trip Time At 19.0 x PU	0 ms
Curve A Trip Time At 19.5 x PU	0 ms
Curve A Trip Time At 20.0 x PU	0 ms

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
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FLEXCURVE B

FLEXCURVE B

Curve B Trip Time At 1.03 x PU	0 ms
Curve B Trip Time At 1.05 x PU	0 ms
Curve B Trip Time At 1.1 x PU	0 ms
Curve B Trip Time At 1.2 x PU	0 ms
Curve B Trip Time At 1.3 x PU	0 ms
Curve B Trip Time At 1.4 x PU	0 ms
Curve B Trip Time At 1.5 x PU	0 ms
Curve B Trip Time At 1.6 x PU	0 ms
Curve B Trip Time At 1.7 x PU	0 ms
Curve B Trip Time At 1.8 x PU	0 ms
Curve B Trip Time At 1.9 x PU	0 ms
Curve B Trip Time At 2.0 x PU	0 ms
Curve B Trip Time At 2.1 x PU	0 ms
Curve B Trip Time At 2.2 x PU	0 ms
Curve B Trip Time At 2.3 x PU	0 ms
Curve B Trip Time At 2.4 x PU	0 ms
Curve B Trip Time At 2.5 x PU	0 ms
Curve B Trip Time At 2.6 x PU	0 ms
Curve B Trip Time At 2.7 x PU	0 ms
Curve B Trip Time At 2.8 x PU	0 ms
Curve B Trip Time At 2.9 x PU	0 ms
Curve B Trip Time At 3.0 x PU	0 ms
Curve B Trip Time At 3.1 x PU	0 ms
Curve B Trip Time At 3.2 x PU	0 ms
Curve B Trip Time At 3.3 x PU	0 ms
Curve B Trip Time At 3.4 x PU	0 ms
Curve B Trip Time At 3.5 x PU	0 ms
Curve B Trip Time At 3.6 x PU	0 ms
Curve B Trip Time At 3.7 x PU	0 ms
Curve B Trip Time At 3.8 x PU	0 ms
Curve B Trip Time At 3.9 x PU	0 ms
Curve B Trip Time At 4.0 x PU	0 ms
Curve B Trip Time At 4.1 x PU	0 ms
Curve B Trip Time At 4.2 x PU	0 ms
Curve B Trip Time At 4.3 x PU	0 ms
Curve B Trip Time At 4.4 x PU	0 ms
Curve B Trip Time At 4.5 x PU	0 ms
Curve B Trip Time At 4.6 x PU	0 ms
Curve B Trip Time At 4.7 x PU	0 ms
Curve B Trip Time At 4.8 x PU	0 ms
Curve B Trip Time At 4.9 x PU	0 ms
Curve B Trip Time At 5.0 x PU	0 ms

Curve B Trip Time At 5.1 x PU	0 ms
Curve B Trip Time At 5.2 x PU	0 ms
Curve B Trip Time At 5.3 x PU	0 ms
Curve B Trip Time At 5.4 x PU	0 ms
Curve B Trip Time At 5.5 x PU	0 ms
Curve B Trip Time At 5.6 x PU	0 ms
Curve B Trip Time At 5.7 x PU	0 ms
Curve B Trip Time At 5.8 x PU	0 ms
Curve B Trip Time At 5.9 x PU	0 ms
Curve B Trip Time At 6.0 x PU	0 ms
Curve B Trip Time At 6.5 x PU	0 ms
Curve B Trip Time At 7.0 x PU	0 ms
Curve B Trip Time At 7.5 x PU	0 ms
Curve B Trip Time At 8.0 x PU	0 ms
Curve B Trip Time At 8.5 x PU	0 ms
Curve B Trip Time At 9.0 x PU	0 ms
Curve B Trip Time At 9.5 x PU	0 ms
Curve B Trip Time At 10.0 x PU	0 ms
Curve B Trip Time At 10.5 x PU	0 ms
Curve B Trip Time At 11.0 x PU	0 ms
Curve B Trip Time At 11.5 x PU	0 ms
Curve B Trip Time At 12.0 x PU	0 ms
Curve B Trip Time At 12.5 x PU	0 ms
Curve B Trip Time At 13.0 x PU	0 ms
Curve B Trip Time At 13.5 x PU	0 ms
Curve B Trip Time At 14.0 x PU	0 ms
Curve B Trip Time At 14.5 x PU	0 ms
Curve B Trip Time At 15.0 x PU	0 ms
Curve B Trip Time At 15.5 x PU	0 ms
Curve B Trip Time At 16.0 x PU	0 ms
Curve B Trip Time At 16.5 x PU	0 ms
Curve B Trip Time At 17.0 x PU	0 ms
Curve B Trip Time At 17.5 x PU	0 ms
Curve B Trip Time At 18.0 x PU	0 ms
Curve B Trip Time At 18.5 x PU	0 ms
Curve B Trip Time At 19.0 x PU	0 ms
Curve B Trip Time At 19.5 x PU	0 ms
Curve B Trip Time At 20.0 x PU	0 ms

Type: SR750
Revision: Fl.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:45

PHASE PROTECTION

PHASE TIME OVERCURRENT

Phase Time O/C Function	TRIP
Phase Time O/C Relays (3-7)	-----
Phase Time O/C Curve	CURVE 1
Phase Time O/C Voltage Restraint	DISABLED

PHASE LOSET OVERCURRENT

Phase Loset O/C Function	DISABLED
Phase Loset O/C Relays (3-7)	-----
Phase Loset O/C Pickup	20.00 x CT
Phase Loset O/C Delay	0.00 s
Phases Required for Operation	ANY ONE

PHASE HISET OVERCURRENT

Phase Hiset O/C Function	TRIP
Phase Hiset O/C Relays (3-7)	-4---
Phase Hiset O/C Pickup	20.00 x CT
Phase Hiset O/C Delay	0.30 s
Phases Required for Operation	ANY ONE

PHASE DIRECTIONAL

Phase Directional Function	DISABLED
Phase Directional Relays (3-7)	-----
Phase Directional MTA	30 ½
All Phase O/C Upon VT Failure	DISABLED

Type: SR750
Revision: F1.60
File Name: MAIN
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GROUND PROTECTION

GROUND TIME OVERCURRENT

Ground Time O/C Function	DISABLED
Ground Time O/C Relays (3-7)	-----
Ground Time O/C Curve	CURVE 2

GROUND LOSET OVERCURRENT

Ground Loset O/C Function	DISABLED
Ground Loset O/C Relays (3-7)	-----
Ground Loset O/C Pickup	1.00 x CT
Ground Loset O/C Delay	0.00 s

GROUND HISET OVERCURRENT

Ground Hiset O/C Function	TRIP
Ground Hiset O/C Relays (3-7)	--5--
Ground Hiset O/C Pickup	0.20 x CT
Ground Hiset O/C Delay	2.00 s

GROUND DIRECTIONAL

Ground Directional Function	DISABLED
Ground Directional Relays (3-7)	-----
Ground Polarization	VOLTAGE
Ground Directional MTA	315 ½
Minimum Polarizing Voltage	0.05 x VT
All Ground O/C Upon VT Failure	DISABLED

NEUTRAL TIME OVERCURRENT

Neutral Time O/C Function	DISABLED
Neutral Time O/C Relays (3-7)	-----
Neutral Time O/C Curve	CURVE 1

NEUTRAL LOSET OVERCURRENT

Neutral Loset O/C Function	DISABLED
Neutral Loset O/C Relays (3-7)	-----
Neutral Loset O/C Pickup	1.00 x CT
Neutral Loset O/C Delay	0.00 s

NEUTRAL HISET OVERCURRENT

Neutral Hiset O/C Function	DISABLED
Neutral Hiset O/C Relays (3-7)	-----
Neutral Hiset O/C Pickup	10.00 x CT
Neutral Hiset O/C Delay	0.00 s

Type: SR750
 Revision: F1.60
 File Name: MAIN
 Comment:
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FEATURE BLOCKING

MANUAL CLOSE FEATURE BLOCKING

Manual Close Function	DISABLED
Manual Close Relays (3-7)	-----
Phase Loset O/C Blocked Time	0 s
Phase Hiset O/C Blocked Time	0.0 s
Ground Loset O/C Blocked Time	0 s
Neutral Hiset O/C Blocked Time	0.0 s
Neutral Loset O/C Blocked Time	0 s
Ground Hiset O/C Blocked Time	0.0 s
Phase Time O/C Raised Time	0 s
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 s
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 s
Neutral Time O/C Raised Pickup	0 %

COLD LOAD PICKUP

Cold Load Pickup Function	DISABLED
Cold Load Pickup Relays (3-7)	-----
Outage Time Before Cold Load	100 min
Phase Loset O/C Blocked Time	0 s
Phase Hiset O/C Blocked Time	0.0 s
Ground Loset O/C Blocked Time	0 s
Ground Hiset O/C Blocked Time	0.0 s
Neutral Loset O/C Blocked Time	0 s
Neutral Hiset O/C Blocked Time	0.0 s
Phase Time O/C Raised Time	0 s
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 s
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 s
Neutral Time O/C Raised Pickup	0 %

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:46

VOLTAGE

BUS UNDERVOLTAGE 1

Bus Undervoltage 1 Function	TRIP
Bus Undervoltage 1 Relays (3-7)	3----
Bus Undervoltage 1 Pickup	0.92 x VT
Bus Undervoltage 1 Delay	2.0 s
Phases Required for Operation	ANY THREE
Minimum Operating Voltage	0.00 x VT
Bus Undervoltage 1 Curve	DEFINITE TIME

BUS UNDERVOLTAGE 2

Bus Undervoltage 2 Function	DISABLED
Bus Undervoltage 2 Relays (3-7)	-----
Bus Undervoltage 2 Pickup	0.75 x VT
Bus Undervoltage 2 Delay	2.0 s
Phases Required for Operation	ALL THREE
Minimum Operating Voltage	0.30 x VT
Bus Undervoltage 2 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 3

Line Undervoltage 3 Function	DISABLED
Line Undervoltage 3 Relays (3-7)	-----
Line Undervoltage 3 Pickup	0.75 x VT
Line Undervoltage 3 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 3 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 4

Line Undervoltage 4 Function	DISABLED
Line Undervoltage 4 Relays (3-7)	-----
Line Undervoltage 4 Pickup	0.75 x VT
Line Undervoltage 4 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 4 Curve	DEFINITE TIME

OVERVOLTAGE 1

Overvoltage 1 Function	DISABLED
Overvoltage 1 Relays (3-7)	-----
Overvoltage 1 Pickup	1.25 x VT
Overvoltage 1 Delay	2.0 s
Phases Required for Operation	ALL THREE

OVERVOLTAGE 2

Overvoltage 2 Function	DISABLED
------------------------	----------

Overvoltage 2 Relays (3-7)

Overvoltage 2 Pickup

1.25 x VT

Overvoltage 2 Delay

2.0 s

Phases Required for Operation

ALL THREE

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:47

UNDERFREQUENCY

UNDERFREQUENCY 1

Underfrequency 1 Function	TRIP
Underfrequency 1 Relays (3-7)	-----
Underfrequency 1 Pickup	59.00 Hz
Underfrequency 1 Delay	2.00 s
Minimum Operating Voltage	0.50 x VT

UNDERFREQUENCY 2

Underfrequency 2 Function	DISABLED
Underfrequency 2 Relays	-----
Underfrequency 2 Pickup	58.00 Hz
Underfrequency 2 Delay	3.00 s
Minimum Operating Voltage	0.70 x VT

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:47

TRANSFER

TRANSFER

Transfer Function	DISABLED
Transfer Delay This Source	1.0 s
Transfer Delay Other Source	3.0 s

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:47

CURRENT LEVEL

PHASE CURRENT LEVEL

Phase Current Level Function	DISABLED
Phase Current Level Relays (3-7)	-----
Phase Current Level Pickup	1.10 x CT
Phase Current Level Delay	2 s

GROUND CURRENT LEVEL

Ground Current Level Function	DISABLED
Ground Current Level Relays (3-7)	-----
Ground Current Level Pickup	1.10 x CT
Ground Current Level Delay	2 s

Type: SR750
 Revision: F1.60
 File Name: MAIN
 Comment:
 Date: Mon Jan 27, 1997
 Time: 17:44:47

POWER FACTOR

POWER FACTOR 1

Power Factor 1 Function	DISABLED
Power Factor 1 Relays	-----
Power Factor 1 Pickup	0.80 Lag
Power Factor 1 Dropout	1.00
Power Factor 1 Delay	50 s

POWER FACTOR 2

Power Factor 2 Function	DISABLED
Power Factor 2 Relays	-----
Power Factor 2 Pickup	0.80 Lag
Power Factor 2 Dropout	1.00
Power Factor 2 Delay	50 s

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:47

SYNCHROCHECK

SYNCHROCHECK

Synchrocheck Function	DISABLED
Synchrocheck Relays	-----
Dead Source Permissive	OFF
Dead Bus Maximum Voltage	0.20 x VT
Dead line Maximum Voltage	0.20 x VT
Minimum Bus Voltage	0.80 x VT
Minimum Line Voltage	0.80 x VT
Maximum Voltage Difference	2.0 kV
Maximum Angle Difference	24 ½
Maximum Frequency Difference	2.00 Hz

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
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FAULT LOCATOR

FAULT LOCATOR

Length Of Feeder	0.1 Units
Units Of Length	km
Zpos (Resistive) Of Feeder	0.01 Ohms
Zpos (Inductive) Of Feeder	0.01 Ohms
Zzero (Resistive) Of Feeder	0.01 Ohms
Zzero (Inductive) Of Feeder	0.01 Ohms

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:47

DEMAND

CURRENT DEMAND

Current Demand Function	DISABLED
Measurement Type	THERMAL EXPONENTIAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Current Demand Relays	----
Current Demand Pickup	1000 A

REAL POWER DEMAND

Real Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Real Power Demand Relays	----
Real Power Demand Pickup	10.0 MW

REACTIVE POWER DEMAND

Reactive Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Reactive Power Demand Relays	----
Reactive Power Demand Pickup	10.0 Mvar

APPARENT POWER DEMAND

Apparent Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Apparent Power Demand Relays	----
Apparent Power Demand Pickup	10.0 MVA

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:48

ANALOG INPUT

ANALOG INPUT SETUP

ANALOG INPUT NAME	ANALOG INPUT
ANALOG INPUT UNITS	uA
ANALOG INPUT RANGE	0-20 mA
ANALOG INPUT MINIMUM VALUE	0 Units
ANALOG INPUT MAXIMUM VALUE	20000 Units

ANALOG THRESHOLD 1

ANALOG THRESHOLD 1 FUNCTION	DISABLED
ANALOG THRESHOLD 1 RELAYS (3-7)	-----
ANALOG THRESHOLD 1 PICKUP	10 Units
ANALOG THRESHOLD 1 DELAY	50 s

ANALOG THRESHOLD 2

ANALOG THRESHOLD 2 FUNCTION	DISABLED
ANALOG THRESHOLD 2 RELAYS (3-7)	-----
ANALOG THRESHOLD 2 PICKUP	100 Units
ANALOG THRESHOLD 2 DELAY	100 s

ANALOG RATE OF CHANGE 1

ANALOG IN RATE 1 FUNCTION	DISABLED
ANALOG IN RATE 1 RELAYS (3-7)	-----
ANALOG IN RATE 1 PICKUP	10.0 Units/hr
ANALOG IN RATE 1 DELAY	0 s

ANALOG RATE OF CHANGE 2

ANALOG IN RATE 2 FUNCTION	DISABLED
ANALOG IN RATE 2 RELAYS (3-7)	-----
ANALOG IN RATE 2 PICKUP	10.0 Units/hr
ANALOG IN RATE 2 DELAY	0 s

Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:48

ANALOG OUTPUTS

ANALOG OUTPUT 1

Analog Output 1 Parameter	PHASE A CURRENT
Analog Output 1 Minimum	0 A
Analog Output 1 Maximum	600 A

ANALOG OUTPUT 2

Analog Output 2 Parameter	PHASE B CURRENT
Analog Output 2 Minimum	0 A
Analog Output 2 Maximum	600 A

ANALOG OUTPUT 3

Analog Output 3 Parameter	PHASE C CURRENT
Analog Output 3 Minimum	0 A
Analog Output 3 Maximum	600 A

ANALOG OUTPUT 4

Analog Output 4 Parameter	AVG LINE VOLTAGE
Analog Output 4 Minimum	0.00 kV
Analog Output 4 Maximum	2.40 kV

ANALOG OUTPUT 5

Analog Output 5 Parameter	POWER FACTOR
Analog Output 5 Minimum	0.01 Lead
Analog Output 5 Maximum	0.01 Lag

ANALOG OUTPUT 6

Analog Output 6 Parameter	REAL POWER
Analog Output 6 Minimum	0.0 MW
Analog Output 6 Maximum	2.0 MW

ANALOG OUTPUT 7

Analog Output 7 Parameter	DISABLED
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ANALOG OUTPUT 8

Analog Output 8 Parameter	DISABLED
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Type: SR750
Revision: F1.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:48

OVERFREQUENCY

OVERFREQUENCY

Overfrequency Function	DISABLED
Overfrequency Relays (3-7)	-----
Overfrequency Pickup	61.00 Hz
Overfrequency Delay	2.0 s

Type: SR750
Revision: Fl.60
File Name: MAIN
Comment:
Date: Mon Jan 27, 1997
Time: 17:44:48

EQUIPMENT

TRIP COUNTER

Trip Counter Function	DISABLED
Trip Counter Relays (3-7)	-----
Trip Counter Limit	10000 Trips

TOTAL ARCING CURRENT

Total Arcing Current Function	DISABLED
Total Arcing Current Relays (3-7)	-----
Total Arcing Current Start Del	

Type: SR750
Revision: F1.60
File Name: FEEDER
Comment:
Date: Mon Jan 27, 1997
Time: 17:40:19

RELAY SETUP

PASSCODE

Available From Front Panel Only

PREFERENCES

Beeper	ENABLED
Flash Message Time	4.0 s
Default Message Timeout	300 s
Default Message Intensity	25 %

COMMUNICATIONS

Slave Address	254
COM1 Baud Rate	9600
COM1 Parity	NONE
COM1 Communication Hardware	RS485
COM2 Baud Rate	9600
COM2 Parity	NONE

CLOCK

Date : Month	Jan
Day	23
Year	1997
Time : Hour	9
Minute	37
Second	0.000

EVENT RECORDER SETUP

Event Recorder Function	ENABLED
Recording of Pickup Events	ENABLED
Recording of Trip Events	ENABLED
Recording of Alarm Events	ENABLED
Recording of Control Events	DISABLED
Recording of Dropout Events	ENABLED
Recording of Logic Input Events	ENABLED

SELECTED DEFAULT MESSAGES

Available From Front Panel Only

USER TEXT DEFAULT MESSAGES

Message 1 line 1	Text 1
line 2	
Message 2 line 1	Text 2
line 2	
Message 3 line 1	Text 3
line 2	
Message 4 line 1	Text 4

Message 5 line 2
line 1
line 2

Text 5

INSTALLATION

SR750 Operation

READY

Type: SR750
Revision: F1.60
File Name: FEEDER
Comment:
Date: Mon Jan 27, 1997
Time: 17:40:19

SYSTEM SETUP

CURRENT SENSING

Phase CT Primary	600 A
Ground CT Primary	50 A
Polarizing CT Primary	200 A

BUS VOLTAGE SENSING

Bus VT Connection Type	WYE
Bus Nominal VT Secondary Voltage	120.0 V
Bus VT Ratio	20:1

LINE VOLTAGE SENSING

Line VT Connection Type	VAN
Line Nominal VT Secondary Voltage	69.3 V
Line VT Ratio	20:1

POWER SYSTEM

Nominal Frequency	60 Hz
Cost of Energy	4.0 /kWh

Type: SR750
Revision: Fl.60
File Name: FEEDER
Comment:
Date: Mon Jan 27, 1997
Time: 17:40:19

LOGIC INPUTS

LOGIC INPUT 1	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 2	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 3	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 4	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 5	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 6	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 7	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 8	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 9	
State Logic	CONTACT ONLY
Asserted Contact State	OPEN
LOGIC INPUT 10	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 11	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED

LOGIC INPUT 12

State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

LOGIC INPUT 13

State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

LOGIC INPUT 14

State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

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USER INPUTS

BREAKER FUNCTIONS

52a Contact	DISABLED
52b Contact	DISABLED
Breaker Connected	DISABLED

CONTROL FUNCTIONS

Local Mode	INPUT 9
Remote Reset	DISABLED
Remote Open	DISABLED
Remote Close	DISABLED
Cold Load Pickup	DISABLED

USER INPUT 1

User Input 1 Name	User Input 1
User Input 1	DISABLED
User Input 1 Function	DISABLED
User Input 1 Relays (3-7)	-----
User Input 1 Delay	0.00 s

USER INPUT 2

User Input 2 Name	User Input 2
User Input 2	DISABLED
User Input 2 Function	DISABLED
User Input 2 Relays (3-7)	-----
User Input 2 Delay	0.00 s

USER INPUT 3

User Input 3 Name	User Input 3
User Input 3	DISABLED
User Input 3 Function	DISABLED
User Input 3 Relays (3-7)	-----
User Input 3 Delay	0.00 s

USER INPUT 4

User Input 4 Name	User Input 4
User Input 4	DISABLED
User Input 4 Function	DISABLED
User Input 4 Relays (3-7)	-----
User Input 4 Delay	0.00 s

USER INPUT 5

User Input 5 Name	User Input 5
User Input 5	DISABLED

User Input 5 Function	DISABLED
User Input 5 Relays (3-7)	-----
User Input 5 Delay	0.00 s
USER INPUT 6	
User Input 6 Name	User Input 6
User Input 6 Function	DISABLED
User Input 6 Relays (3-7)	-----
User Input 6 Delay	0.00 s
USER INPUT 7	
User Input 7 Name	User Input 7
User Input 7 Function	DISABLED
User Input 7 Relays (3-7)	-----
User Input 7 Delay	0.00 s
USER INPUT 8	
User Input 8 Name	User Input 8
User Input 8 Function	DISABLED
User Input 8 Relays (3-7)	-----
User Input 8 Delay	0.00 s
BLOCKING FUNCTIONS	
Block 1 TRIP Relay	DISABLED
Block 2 CLOSE Relay	DISABLED
Block Reset	DISABLED
Block Undervoltage 1	DISABLED
Block Undervoltage 2	DISABLED
Block Undervoltage 3	DISABLED
Block Undervoltage 4	DISABLED
Block Underfrequency 1	DISABLED
Block Underfrequency 2	DISABLED
Bypass Synchrocheck	DISABLED
Block Trip Counters	DISABLED
OVERCURRENT BLOCKING FUNCTIONS	
Block All Overcurrent	DISABLED
Block Phase Overcurrent	DISABLED
Block Ground Overcurrent	DISABLED
Block Neutral Overcurrent	DISABLED
Block Phase Time O/C	DISABLED
Block Phase Loset O/C	DISABLED
Block Phase Hiset O/C	DISABLED
Block Ground Time O/C	DISABLED
Block Ground Loset O/C	DISABLED
Block Ground Hiset O/C	DISABLED
Block Neutral Time O/C	DISABLED
Block Neutral Loset O/C	DISABLED
Block Neutral Hiset O/C	DISABLED
TRANSFER FUNCTIONS	
Selected To Trip	DISABLED
Undervoltage On Other Source	DISABLED
Incomer 1 Breaker Closed	DISABLED

Incomer 2 Breaker Closed	DISABLED
Tie Breaker Connected	DISABLED
Tie Breaker Closed	DISABLED
Block Transfer	DISABLED
Transformer Lockout	DISABLED
Source Trip	DISABLED
Close From Incomer 1	DISABLED
Close From Incomer 2	DISABLED

MISCELLANEOUS FUNCTIONS

Trigger Trace Memory	DISABLED
Simulate Fault	DISABLED

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OUTPUT RELAYS

1 TRIP	
Relay 1 Name	TRIP
Relay 1 Non-Operated State	DE ENERGIZED
Relay 1 Output Type	FEEDBACK CONTROL
2 CLOSE	
Relay 2 Name	CLOSE
Relay 2 Non-Operated State	DE-ENERGIZED
Relay 2 Output Type	FEEDBACK CONTROL
3 ALARM	
Relay 3 Name	LINE UNDERVOLT
Relay 3 Non-Operated State	DE-ENERGIZED
Relay 3 Output Type	LATCHED
4 AUXILIARY	
Relay 4 Name	INSTANTANEOUS
Relay 4 Non-Operated State	DE-ENERGIZED
Relay 4 Output Type	LATCHED
5 AUXILIARY	
Relay 5 Name	GROUND FAULT
Relay 5 Non-Operated State	DE-ENERGIZED
Relay 5 Output Type	LATCHED
6 AUXILIARY	
Relay 6 Name	AUXILIARY
Relay 6 Non-Operated State	DE-ENERGIZED
Relay 6 Output Type	SELF-RESETTING
7 AUXILIARY	
Relay 7 Name	AUXILIARY
Relay 7 Non-Operated State	DE-ENERGIZED
Relay 7 Output Type	SELF-RESETTING
8 SERVICE	
Relay 8 Name	SERVICE
Relay 8 Non-Operated State	ENERGIZED
Relay 8 Output Type	SELF-RESETTING

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CURVES 1-6

CURVE 1

Curve 1 Pickup	1.00 x CT
Curve 1 Shape	IEC CURVE C
Curve 1 Multiplier	1.0
Curve 1 Multiplier (for IEC)	1.00
Curve 1 Reset Time	INSTANTANEOUS

CURVE 2

Curve 2 Pickup	0.28 x CT
Curve 2 Shape	IEC CURVE B
Curve 2 Multiplier	0.7
Curve 2 Multiplier (for IEC)	0.71
Curve 2 Reset Time	INSTANTANEOUS

CURVE 3

Curve 3 Pickup	0.85 x CT
Curve 3 Shape	EXTREMELY INVERSE
Curve 3 Multiplier	1.0
Curve 3 Multiplier (for IEC)	0.05
Curve 3 Reset Time	INSTANTANEOUS

CURVE 4

Curve 4 Pickup	0.85 x CT
Curve 4 Shape	EXTREMELY INVERSE
Curve 4 Multiplier	1.0
Curve 4 Multiplier (for IEC)	0.05
Curve 4 Reset Time	INSTANTANEOUS

CURVE 5

Curve 5 Pickup	0.85 x CT
Curve 5 Shape	EXTREMELY INVERSE
Curve 5 Multiplier	1.0
Curve 5 Multiplier (for IEC)	0.05
Curve 5 Reset Time	INSTANTANEOUS

CURVE 6

Curve 6 Pickup	0.85 x CT
Curve 6 Shape	EXTREMELY INVERSE
Curve 6 Multiplier	1.0
Curve 6 Multiplier (for IEC)	0.05
Curve 6 Reset Time	INSTANTANEOUS

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FLEXCURVE A

FLEXCURVE A

Curve A Trip Time At 1.03 x PU	0 ms
Curve A Trip Time At 1.05 x PU	0 ms
Curve A Trip Time At 1.1 x PU	0 ms
Curve A Trip Time At 1.2 x PU	0 ms
Curve A Trip Time At 1.3 x PU	0 ms
Curve A Trip Time At 1.4 x PU	0 ms
Curve A Trip Time At 1.5 x PU	0 ms
Curve A Trip Time At 1.6 x PU	0 ms
Curve A Trip Time At 1.7 x PU	0 ms
Curve A Trip Time At 1.8 x PU	0 ms
Curve A Trip Time At 1.9 x PU	0 ms
Curve A Trip Time At 2.0 x PU	0 ms
Curve A Trip Time At 2.1 x PU	0 ms
Curve A Trip Time At 2.2 x PU	0 ms
Curve A Trip Time At 2.3 x PU	0 ms
Curve A Trip Time At 2.4 x PU	0 ms
Curve A Trip Time At 2.5 x PU	0 ms
Curve A Trip Time At 2.6 x PU	0 ms
Curve A Trip Time At 2.7 x PU	0 ms
Curve A Trip Time At 2.8 x PU	0 ms
Curve A Trip Time At 2.9 x PU	0 ms
Curve A Trip Time At 3.0 x PU	0 ms
Curve A Trip Time At 3.1 x PU	0 ms
Curve A Trip Time At 3.2 x PU	0 ms
Curve A Trip Time At 3.3 x PU	0 ms
Curve A Trip Time At 3.4 x PU	0 ms
Curve A Trip Time At 3.5 x PU	0 ms
Curve A Trip Time At 3.6 x PU	0 ms
Curve A Trip Time At 3.7 x PU	0 ms
Curve A Trip Time At 3.8 x PU	0 ms
Curve A Trip Time At 3.9 x PU	0 ms
Curve A Trip Time At 4.0 x PU	0 ms
Curve A Trip Time At 4.1 x PU	0 ms
Curve A Trip Time At 4.2 x PU	0 ms
Curve A Trip Time At 4.3 x PU	0 ms
Curve A Trip Time At 4.4 x PU	0 ms
Curve A Trip Time At 4.5 x PU	0 ms
Curve A Trip Time At 4.6 x PU	0 ms
Curve A Trip Time At 4.7 x PU	0 ms
Curve A Trip Time At 4.8 x PU	0 ms
Curve A Trip Time At 4.9 x PU	0 ms
Curve A Trip Time At 5.0 x PU	0 ms

Curve A Trip Time At 5.1 x PU	0 ms
Curve A Trip Time At 5.2 x PU	0 ms
Curve A Trip Time At 5.3 x PU	0 ms
Curve A Trip Time At 5.4 x PU	0 ms
Curve A Trip Time At 5.5 x PU	0 ms
Curve A Trip Time At 5.6 x PU	0 ms
Curve A Trip Time At 5.7 x PU	0 ms
Curve A Trip Time At 5.8 x PU	0 ms
Curve A Trip Time At 5.9 x PU	0 ms
Curve A Trip Time At 6.0 x PU	0 ms
Curve A Trip Time At 6.5 x PU	0 ms
Curve A Trip Time At 7.0 x PU	0 ms
Curve A Trip Time At 7.5 x PU	0 ms
Curve A Trip Time At 8.0 x PU	0 ms
Curve A Trip Time At 8.5 x PU	0 ms
Curve A Trip Time At 9.0 x PU	0 ms
Curve A Trip Time At 9.5 x PU	0 ms
Curve A Trip Time At 10.0 x PU	0 ms
Curve A Trip Time At 10.5 x PU	0 ms
Curve A Trip Time At 11.0 x PU	0 ms
Curve A Trip Time At 11.5 x PU	0 ms
Curve A Trip Time At 12.0 x PU	0 ms
Curve A Trip Time At 12.5 x PU	0 ms
Curve A Trip Time At 13.0 x PU	0 ms
Curve A Trip Time At 13.5 x PU	0 ms
Curve A Trip Time At 14.0 x PU	0 ms
Curve A Trip Time At 14.5 x PU	0 ms
Curve A Trip Time At 15.0 x PU	0 ms
Curve A Trip Time At 15.5 x PU	0 ms
Curve A Trip Time At 16.0 x PU	0 ms
Curve A Trip Time At 16.5 x PU	0 ms
Curve A Trip Time At 17.0 x PU	0 ms
Curve A Trip Time At 17.5 x PU	0 ms
Curve A Trip Time At 18.0 x PU	0 ms
Curve A Trip Time At 18.5 x PU	0 ms
Curve A Trip Time At 19.0 x PU	0 ms
Curve A Trip Time At 19.5 x PU	0 ms
Curve A Trip Time At 20.0 x PU	0 ms

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FLEXCURVE B

FLEXCURVE B

Curve B Trip Time At 1.03 x PU	0 ms
Curve B Trip Time At 1.05 x PU	0 ms
Curve B Trip Time At 1.1 x PU	0 ms
Curve B Trip Time At 1.2 x PU	0 ms
Curve B Trip Time At 1.3 x PU	0 ms
Curve B Trip Time At 1.4 x PU	0 ms
Curve B Trip Time At 1.5 x PU	0 ms
Curve B Trip Time At 1.6 x PU	0 ms
Curve B Trip Time At 1.7 x PU	0 ms
Curve B Trip Time At 1.8 x PU	0 ms
Curve B Trip Time At 1.9 x PU	0 ms
Curve B Trip Time At 2.0 x PU	0 ms
Curve B Trip Time At 2.1 x PU	0 ms
Curve B Trip Time At 2.2 x PU	0 ms
Curve B Trip Time At 2.3 x PU	0 ms
Curve B Trip Time At 2.4 x PU	0 ms
Curve B Trip Time At 2.5 x PU	0 ms
Curve B Trip Time At 2.6 x PU	0 ms
Curve B Trip Time At 2.7 x PU	0 ms
Curve B Trip Time At 2.8 x PU	0 ms
Curve B Trip Time At 2.9 x PU	0 ms
Curve B Trip Time At 3.0 x PU	0 ms
Curve B Trip Time At 3.1 x PU	0 ms
Curve B Trip Time At 3.2 x PU	0 ms
Curve B Trip Time At 3.3 x PU	0 ms
Curve B Trip Time At 3.4 x PU	0 ms
Curve B Trip Time At 3.5 x PU	0 ms
Curve B Trip Time At 3.6 x PU	0 ms
Curve B Trip Time At 3.7 x PU	0 ms
Curve B Trip Time At 3.8 x PU	0 ms
Curve B Trip Time At 3.9 x PU	0 ms
Curve B Trip Time At 4.0 x PU	0 ms
Curve B Trip Time At 4.1 x PU	0 ms
Curve B Trip Time At 4.2 x PU	0 ms
Curve B Trip Time At 4.3 x PU	0 ms
Curve B Trip Time At 4.4 x PU	0 ms
Curve B Trip Time At 4.5 x PU	0 ms
Curve B Trip Time At 4.6 x PU	0 ms
Curve B Trip Time At 4.7 x PU	0 ms
Curve B Trip Time At 4.8 x PU	0 ms
Curve B Trip Time At 4.9 x PU	0 ms
Curve B Trip Time At 5.0 x PU	0 ms

Curve B Trip Time At 5.1 x PU	0 ms
Curve B Trip Time At 5.2 x PU	0 ms
Curve B Trip Time At 5.3 x PU	0 ms
Curve B Trip Time At 5.4 x PU	0 ms
Curve B Trip Time At 5.5 x PU	0 ms
Curve B Trip Time At 5.6 x PU	0 ms
Curve B Trip Time At 5.7 x PU	0 ms
Curve B Trip Time At 5.8 x PU	0 ms
Curve B Trip Time At 5.9 x PU	0 ms
Curve B Trip Time At 6.0 x PU	0 ms
Curve B Trip Time At 6.5 x PU	0 ms
Curve B Trip Time At 7.0 x PU	0 ms
Curve B Trip Time At 7.5 x PU	0 ms
Curve B Trip Time At 8.0 x PU	0 ms
Curve B Trip Time At 8.5 x PU	0 ms
Curve B Trip Time At 9.0 x PU	0 ms
Curve B Trip Time At 9.5 x PU	0 ms
Curve B Trip Time At 10.0 x PU	0 ms
Curve B Trip Time At 10.5 x PU	0 ms
Curve B Trip Time At 11.0 x PU	0 ms
Curve B Trip Time At 11.5 x PU	0 ms
Curve B Trip Time At 12.0 x PU	0 ms
Curve B Trip Time At 12.5 x PU	0 ms
Curve B Trip Time At 13.0 x PU	0 ms
Curve B Trip Time At 13.5 x PU	0 ms
Curve B Trip Time At 14.0 x PU	0 ms
Curve B Trip Time At 14.5 x PU	0 ms
Curve B Trip Time At 15.0 x PU	0 ms
Curve B Trip Time At 15.5 x PU	0 ms
Curve B Trip Time At 16.0 x PU	0 ms
Curve B Trip Time At 16.5 x PU	0 ms
Curve B Trip Time At 17.0 x PU	0 ms
Curve B Trip Time At 17.5 x PU	0 ms
Curve B Trip Time At 18.0 x PU	0 ms
Curve B Trip Time At 18.5 x PU	0 ms
Curve B Trip Time At 19.0 x PU	0 ms
Curve B Trip Time At 19.5 x PU	0 ms
Curve B Trip Time At 20.0 x PU	0 ms

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PHASE PROTECTION

PHASE TIME OVERCURRENT

Phase Time O/C Function	TRIP
Phase Time O/C Relays (3-7)	-----
Phase Time O/C Curve	CURVE 2
Phase Time O/C Voltage Restraint	DISABLED

PHASE LOSET OVERCURRENT

Phase Loset O/C Function	DISABLED
Phase Loset O/C Relays (3-7)	-----
Phase Loset O/C Pickup	20.00 x CT
Phase Loset O/C Delay	0.00 s
Phases Required for Operation	ANY ONE

PHASE HISET OVERCURRENT

Phase Hiset O/C Function	TRIP
Phase Hiset O/C Relays (3-7)	-4---
Phase Hiset O/C Pickup	15.00 x CT
Phase Hiset O/C Delay	0.00 s
Phases Required for Operation	ANY ONE

PHASE DIRECTIONAL

Phase Directional Function	DISABLED
Phase Directional Relays (3-7)	-----
Phase Directional MTA	30 ½
All Phase O/C Upon VT Failure	DISABLED

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GROUND PROTECTION

GROUND TIME OVERCURRENT

Ground Time O/C Function	DISABLED
Ground Time O/C Relays (3-7)	-----
Ground Time O/C Curve	CURVE 2

GROUND LOSET OVERCURRENT

Ground Loset O/C Function	DISABLED
Ground Loset O/C Relays (3-7)	-----
Ground Loset O/C Pickup	1.00 x CT
Ground Loset O/C Delay	0.00 s

GROUND HISET OVERCURRENT

Ground Hiset O/C Function	TRIP
Ground Hiset O/C Relays (3-7)	--5--
Ground Hiset O/C Pickup	0.10 x CT
Ground Hiset O/C Delay	0.75 s

GROUND DIRECTIONAL

Ground Directional Function	DISABLED
Ground Directional Relays (3-7)	-----
Ground Polarization	VOLTAGE
Ground Directional MTA	315 ½
Minimum Polarizing Voltage	0.05 x VT
All Ground O/C Upon VT Failure	DISABLED

NEUTRAL TIME OVERCURRENT

Neutral Time O/C Function	DISABLED
Neutral Time O/C Relays (3-7)	-----
Neutral Time O/C Curve	CURVE 1

NEUTRAL LOSET OVERCURRENT

Neutral Loset O/C Function	DISABLED
Neutral Loset O/C Relays (3-7)	-----
Neutral Loset O/C Pickup	1.00 x CT
Neutral Loset O/C Delay	0.00 s

NEUTRAL HISET OVERCURRENT

Neutral Hiset O/C Function	DISABLED
Neutral Hiset O/C Relays (3-7)	-----
Neutral Hiset O/C Pickup	10.00 x CT
Neutral Hiset O/C Delay	0.00 s

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FEATURE BLOCKING

MANUAL CLOSE FEATURE BLOCKING

Manual Close Function	DISABLED
Manual Close Relays (3-7)	-----
Phase Loset O/C Blocked Time	0 S
Phase Hiset O/C Blocked Time	0.0 S
Ground Loset O/C Blocked Time	0 S
Neutral Hiset O/C Blocked Time	0.0 S
Neutral Loset O/C Blocked Time	0 S
Ground Hiset O/C Blocked Time	0.0 S
Phase Time O/C Raised Time	0 S
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 S
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 S
Neutral Time O/C Raised Pickup	0 %

COLD LOAD PICKUP

Cold Load Pickup Function	DISABLED
Cold Load Pickup Relays (3-7)	-----
Outage Time Before Cold Load	100 min
Phase Loset O/C Blocked Time	0 S
Phase Hiset O/C Blocked Time	0.0 S
Ground Loset O/C Blocked Time	0 S
Ground Hiset O/C Blocked Time	0.0 S
Neutral Loset O/C Blocked Time	0 S
Neutral Hiset O/C Blocked Time	0.0 S
Phase Time O/C Raised Time	0 S
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 S
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 S
Neutral Time O/C Raised Pickup	0 %

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VOLTAGE

BUS UNDERVOLTAGE 1

Bus Undervoltage 1 Function	DISABLED
Bus Undervoltage 1 Relays (3-7)	3----
Bus Undervoltage 1 Pickup	0.92 x VT
Bus Undervoltage 1 Delay	2.0 s
Phases Required for Operation	ANY ONE
Minimum Operating Voltage	0.00 x VT
Bus Undervoltage 1 Curve	DEFINITE TIME

BUS UNDERVOLTAGE 2

Bus Undervoltage 2 Function	DISABLED
Bus Undervoltage 2 Relays (3-7)	-----
Bus Undervoltage 2 Pickup	0.75 x VT
Bus Undervoltage 2 Delay	2.0 s
Phases Required for Operation	ALL THREE
Minimum Operating Voltage	0.30 x VT
Bus Undervoltage 2 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 3

Line Undervoltage 3 Function	DISABLED
Line Undervoltage 3 Relays (3-7)	-----
Line Undervoltage 3 Pickup	0.75 x VT
Line Undervoltage 3 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 3 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 4

Line Undervoltage 4 Function	DISABLED
Line Undervoltage 4 Relays (3-7)	-----
Line Undervoltage 4 Pickup	0.75 x VT
Line Undervoltage 4 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 4 Curve	DEFINITE TIME

OVERVOLTAGE 1

Overvoltage 1 Function	DISABLED
Overvoltage 1 Relays (3-7)	-----
Overvoltage 1 Pickup	1.25 x VT
Overvoltage 1 Delay	2.0 s
Phases Required for Operation	ALL THREE

OVERVOLTAGE 2

Overvoltage 2 Function	DISABLED
------------------------	----------

Overvoltage 2 Relays (3-7)
Overvoltage 2 Pickup
Overvoltage 2 Delay
Phases Required for Operation

1.25 x VT
2.0 s
ALL THREE

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UNDERFREQUENCY

UNDERFREQUENCY 1

Underfrequency 1 Function	DISABLED
Underfrequency 1 Relays (3-7)	-----
Underfrequency 1 Pickup	59.00 Hz
Underfrequency 1 Delay	2.00 s
Minimum Operating Voltage	0.50 x VT

UNDERFREQUENCY 2

Underfrequency 2 Function	DISABLED
Underfrequency 2 Relays	-----
Underfrequency 2 Pickup	58.00 Hz
Underfrequency 2 Delay	3.00 s
Minimum Operating Voltage	0.70 x VT

Type: SR750
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TRANSFER

TRANSFER

Transfer Function	DISABLED
Transfer Delay This Source	1.0 s
Transfer Delay Other Source	3.0 s

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CURRENT LEVEL

PHASE CURRENT LEVEL

Phase Current Level Function	DISABLED
Phase Current Level Relays (3-7)	-----
Phase Current Level Pickup	1.10 x CT
Phase Current Level Delay	2 s

GROUND CURRENT LEVEL

Ground Current Level Function	DISABLED
Ground Current Level Relays (3-7)	-----
Ground Current Level Pickup	1.10 x CT
Ground Current Level Delay	2 s

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POWER FACTOR

POWER FACTOR 1

Power Factor 1 Function	DISABLED
Power Factor 1 Relays	-----
Power Factor 1 Pickup	0.80 Lag
Power Factor 1 Dropout	1.00
Power Factor 1 Delay	50 s

POWER FACTOR 2

Power Factor 2 Function	DISABLED
Power Factor 2 Relays	-----
Power Factor 2 Pickup	0.80 Lag
Power Factor 2 Dropout	1.00
Power Factor 2 Delay	50 s

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SYNCHROCHECK

SYNCHROCHECK

Synchrocheck Function	DISABLED
Synchrocheck Relays	-----
Dead Source Permissive	OFF
Dead Bus Maximum Voltage	0.20 x VT
Dead line Maximum Voltage	0.20 x VT
Minimum Bus Voltage	0.80 x VT
Minimum Line Voltage	0.80 x VT
Maximum Voltage Difference	2.0 kV
Maximum Angle Difference	24 ½
Maximum Frequency Difference	2.00 Hz

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FAULT LOCATOR

FAULT LOCATOR

Length Of Feeder	0.1 Units
Units Of Length	km
Zpos (Resistive) Of Feeder	0.01 Ohms
Zpos (Inductive) Of Feeder	0.01 Ohms
Zzero (Resistive) Of Feeder	0.01 Ohms
Zzero (Inductive) Of Feeder	0.01 Ohms

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DEMAND

CURRENT DEMAND

Current Demand Function	DISABLED
Measurement Type	THERMAL EXPONENTIAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Current Demand Relays	----
Current Demand Pickup	1000 A

REAL POWER DEMAND

Real Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Real Power Demand Relays	----
Real Power Demand Pickup	10.0 MW

REACTIVE POWER DEMAND

Reactive Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Reactive Power Demand Relays	----
Reactive Power Demand Pickup	10.0 Mvar

APPARENT POWER DEMAND

Apparent Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Apparent Power Demand Relays	----
Apparent Power Demand Pickup	10.0 MVA

Type: SR750
Revision: F1.60
File Name: FEEDER
Comment:
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Time: 17:40:25

ANALOG INPUT

ANALOG INPUT SETUP

ANALOG INPUT Name	ANALOG INPUT
Analog Input Units	uA
Analog Input Range	0-20 mA
Analog Input Minimum Value	0 Units
Analog Input Maximum Value	20000 Units

ANALOG THRESHOLD 1

Analog Threshold 1 Function	DISABLED
Analog Threshold 1 Relays (3-7)	-----
Analog Threshold 1 Pickup	10 Units
Analog Threshold 1 Delay	50 s

ANALOG THRESHOLD 2

Analog Threshold 2 Function	DISABLED
Analog Threshold 2 Relays (3-7)	-----
Analog Threshold 2 Pickup	100 Units
Analog Threshold 2 Delay	100 s

ANALOG RATE OF CHANGE 1

Analog In Rate 1 Function	DISABLED
Analog In Rate 1 Relays (3-7)	-----
Analog In Rate 1 Pickup	10.0 Units/hr
Analog In Rate 1 Delay	0 s

ANALOG RATE OF CHANGE 2

Analog In Rate 2 Function	DISABLED
Analog In Rate 2 Relays (3-7)	-----
Analog In Rate 2 Pickup	10.0 Units/hr
Analog In Rate 2 Delay	0 s

Type: SR750
Revision: F1.60
File Name: FEEDER
Comment:
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ANALOG OUTPUTS

ANALOG OUTPUT 1	
Analog Output 1 Parameter	DISABLED
ANALOG OUTPUT 2	
Analog Output 2 Parameter	DISABLED
ANALOG OUTPUT 3	
Analog Output 3 Parameter	DISABLED
ANALOG OUTPUT 4	
Analog Output 4 Parameter	DISABLED
ANALOG OUTPUT 5	
Analog Output 5 Parameter	DISABLED
ANALOG OUTPUT 6	
Analog Output 6 Parameter	DISABLED
ANALOG OUTPUT 7	
Analog Output 7 Parameter	DISABLED
ANALOG OUTPUT 8	
Analog Output 8 Parameter	DISABLED

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Comment:
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OVERFREQUENCY

OVERFREQUENCY

Overfrequency Function	DISABLED
Overfrequency Relays (3-7)	-----
Overfrequency Pickup	61.00 Hz
Overfrequency Delay	2.0 s

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EQUIPMENT

TRIP COUNTER

Trip Counter Function	DISABLED
Trip Counter Relays (3-7)	-----
Trip Counter Limit	10000 Trips

TOTAL ARCING CURRENT

Total Arcing Current Function	DISABLED
Total Arcing Current Relays (3-7)	-----
Total Arcing Current Start Delay	32 ms
Total Arcing Current Limit	1000 kA»-cyc

BREAKER FAILURE

Breaker Failure Function	DISABLED
Breaker Failure Relays (3-7)	-----
Breaker Failure Delay	0.10 s
Breaker Failure Current	1.00 x CT

VT FAILURE

VT Failure Function	DISABLED
VT Failure Relays (3-7)	-----
VT Failure Delay	10 s

BREAKER OPERATION

Breaker Operation Function	DISABLED
Breaker Operation Relays (3-7)	-----
Breaker Operation Delay	0.10 s

TRIP COIL MONITOR

Trip Coil Monitor Function	DISABLED
Trip Coil Monitor Relays (3-7)	-----
Open Breaker Permissive	DISABLED

CLOSE COIL MONITOR

Close Coil Monitor Function	DISABLED
Close Coil Monitor Relays (3-7)	-----
Closed Breaker Permissive	DISABLED

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RELAY SETUP

PASSCODE

Available From Front Panel Only

PREFERENCES

Beeper	ENABLED
Flash Message Time	4.0 s
Default Message Timeout	300 s
Default Message Intensity	25 %

COMMUNICATIONS

Slave Address	254
COM1 Baud Rate	9600
COM1 Parity	NONE
COM1 Communication Hardware	RS485
COM2 Baud Rate	9600
COM2 Parity	NONE

CLOCK

Date : Month	Jan
Day	23
Year	1997
Time : Hour	9
Minute	37
Second	0.000

EVENT RECORDER SETUP

Event Recorder Function	ENABLED
Recording of Pickup Events	ENABLED
Recording of Trip Events	ENABLED
Recording of Alarm Events	ENABLED
Recording of Control Events	DISABLED
Recording of Dropout Events	ENABLED
Recording of Logic Input Events	ENABLED

SELECTED DEFAULT MESSAGES

Available From Front Panel Only

USER TEXT DEFAULT MESSAGES

Message 1 line 1	Text 1
line 2	
Message 2 line 1	Text 2
line 2	
Message 3 line 1	Text 3
line 2	
Message 4 line 1	Text 4

line 2
Message 5 line 1
line 2

Text 5

INSTALLATION

SR750 Operation

NOT READY

Type: SR750
Revision: F1.60
File Name: SPARE
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SYSTEM SETUP

CURRENT SENSING

Phase CT Primary	600 A
Ground CT Primary	50 A
Polarizing CT Primary	200 A

BUS VOLTAGE SENSING

Bus VT Connection Type	WYE
Bus Nominal VT Secondary Voltage	120.0 V
Bus VT Ratio	20:1

LINE VOLTAGE SENSING

Line VT Connection Type	VAN
Line Nominal VT Secondary Voltage	69.3 V
Line VT Ratio	20:1

POWER SYSTEM

Nominal Frequency	60 Hz
Cost of Energy	4.0 /kWh

Type: SR750
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LOGIC INPUTS

LOGIC INPUT 1	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 2	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 3	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 4	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 5	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 6	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 7	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 8	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 9	
State Logic	CONTACT ONLY
Asserted Contact State	OPEN
LOGIC INPUT 10	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED
LOGIC INPUT 11	
State Logic	CONTACT ONLY
Asserted Contact State	CLOSED

LOGIC INPUT 12
State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

LOGIC INPUT 13
State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

LOGIC INPUT 14
State Logic
Asserted Contact State

CONTACT ONLY
CLOSED

Type: SR750
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USER INPUTS

BREAKER FUNCTIONS

52a Contact	DISABLED
52b Contact	DISABLED
Breaker Connected	DISABLED

CONTROL FUNCTIONS

Local Mode	INPUT 9
Remote Reset	DISABLED
Remote Open	DISABLED
Remote Close	DISABLED
Cold Load Pickup	DISABLED

USER INPUT 1

User Input 1 Name	User Input 1
User Input 1	DISABLED
User Input 1 Function	DISABLED
User Input 1 Relays (3-7)	-----
User Input 1 Delay	0.00 s

USER INPUT 2

User Input 2 Name	User Input 2
User Input 2	DISABLED
User Input 2 Function	DISABLED
User Input 2 Relays (3-7)	-----
User Input 2 Delay	0.00 s

USER INPUT 3

User Input 3 Name	User Input 3
User Input 3	DISABLED
User Input 3 Function	DISABLED
User Input 3 Relays (3-7)	-----
User Input 3 Delay	0.00 s

USER INPUT 4

User Input 4 Name	User Input 4
User Input 4	DISABLED
User Input 4 Function	DISABLED
User Input 4 Relays (3-7)	-----
User Input 4 Delay	0.00 s

USER INPUT 5

User Input 5 Name	User Input 5
User Input 5	DISABLED

User Input 5 Function	DISABLED
User Input 5 Relays (3-7)	-----
User Input 5 Delay	0.00 s
USER INPUT 6	
User Input 6 Name	User Input 6
User Input 6	DISABLED
User Input 6 Function	DISABLED
User Input 6 Relays (3-7)	-----
User Input 6 Delay	0.00 s
USER INPUT 7	
User Input 7 Name	User Input 7
User Input 7	DISABLED
User Input 7 Function	DISABLED
User Input 7 Relays (3-7)	-----
User Input 7 Delay	0.00 s
USER INPUT 8	
User Input 8 Name	User Input 8
User Input 8	DISABLED
User Input 8 Function	DISABLED
User Input 8 Relays (3-7)	-----
User Input 8 Delay	0.00 s
BLOCKING FUNCTIONS	
Block 1 TRIP Relay	DISABLED
Block 2 CLOSE Relay	DISABLED
Block Reset	DISABLED
Block Undervoltage 1	DISABLED
Block Undervoltage 2	DISABLED
Block Undervoltage 3	DISABLED
Block Undervoltage 4	DISABLED
Block Underfrequency 1	DISABLED
Block Underfrequency 2	DISABLED
Bypass Synchrocheck	DISABLED
Block Trip Counters	DISABLED
OVERCURRENT BLOCKING FUNCTIONS	
Block All Overcurrent	DISABLED
Block Phase Overcurrent	DISABLED
Block Ground Overcurrent	DISABLED
Block Neutral Overcurrent	DISABLED
Block Phase Time O/C	DISABLED
Block Phase Loset O/C	DISABLED
Block Phase Hiset O/C	DISABLED
Block Ground Time O/C	DISABLED
Block Ground Loset O/C	DISABLED
Block Ground Hiset O/C	DISABLED
Block Neutral Time O/C	DISABLED
Block Neutral Loset O/C	DISABLED
Block Neutral Hiset O/C	DISABLED
TRANSFER FUNCTIONS	
Selected To Trip	DISABLED
Undervoltage On Other Source	DISABLED
Incomer 1 Breaker Closed	DISABLED

Incomer 2 Breaker Closed	DISABLED
Tie Breaker Connected	DISABLED
Tie Breaker Closed	DISABLED
Block Transfer	DISABLED
Transformer Lockout	DISABLED
Source Trip	DISABLED
Close From Incomer 1	DISABLED
Close From Incomer 2	DISABLED

MISCELLANEOUS FUNCTIONS

Trigger Trace Memory	DISABLED
Simulate Fault	DISABLED

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OUTPUT RELAYS

1	TRIP	
	Relay 1 Name	TRIP
	Relay 1 Non-Operated State	DE-ENERGIZED
	Relay 1 Output Type	FEEDBACK CONTROL
2	CLOSE	
	Relay 2 Name	CLOSE
	Relay 2 Non-Operated State	DE-ENERGIZED
	Relay 2 Output Type	FEEDBACK CONTROL
3	ALARM	
	Relay 3 Name	LINE UNDERVOLT
	Relay 3 Non-Operated State	DE-ENERGIZED
	Relay 3 Output Type	LATCHED
4	AUXILIARY	
	Relay 4 Name	INSTANTANEOUS
	Relay 4 Non-Operated State	DE-ENERGIZED
	Relay 4 Output Type	LATCHED
5	AUXILIARY	
	Relay 5 Name	GROUND FAULT
	Relay 5 Non-Operated State	DE-ENERGIZED
	Relay 5 Output Type	LATCHED
6	AUXILIARY	
	Relay 6 Name	AUXILIARY
	Relay 6 Non-Operated State	DE-ENERGIZED
	Relay 6 Output Type	SELF-RESETTING
7	AUXILIARY	
	Relay 7 Name	AUXILIARY
	Relay 7 Non-Operated State	DE-ENERGIZED
	Relay 7 Output Type	SELF-RESETTING
8	SERVICE	
	Relay 8 Name	SERVICE
	Relay 8 Non-Operated State	ENERGIZED
	Relay 8 Output Type	SELF-RESETTING

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CURVES 1-6

CURVE 1

Curve 1 Pickup	1.00 x CT
Curve 1 Shape	IEC CURVE C
Curve 1 Multiplier	1.0
Curve 1 Multiplier (for IEC)	1.00
Curve 1 Reset Time	INSTANTANEOUS

CURVE 2

Curve 2 Pickup	0.28 x CT
Curve 2 Shape	IEC CURVE B
Curve 2 Multiplier	0.7
Curve 2 Multiplier (for IEC)	0.71
Curve 2 Reset Time	INSTANTANEOUS

CURVE 3

Curve 3 Pickup	0.85 x CT
Curve 3 Shape	EXTREMELY INVERSE
Curve 3 Multiplier	1.0
Curve 3 Multiplier (for IEC)	0.05
Curve 3 Reset Time	INSTANTANEOUS

CURVE 4

Curve 4 Pickup	0.85 x CT
Curve 4 Shape	EXTREMELY INVERSE
Curve 4 Multiplier	1.0
Curve 4 Multiplier (for IEC)	0.05
Curve 4 Reset Time	INSTANTANEOUS

CURVE 5

Curve 5 Pickup	0.85 x CT
Curve 5 Shape	EXTREMELY INVERSE
Curve 5 Multiplier	1.0
Curve 5 Multiplier (for IEC)	0.05
Curve 5 Reset Time	INSTANTANEOUS

CURVE 6

Curve 6 Pickup	0.85 x CT
Curve 6 Shape	EXTREMELY INVERSE
Curve 6 Multiplier	1.0
Curve 6 Multiplier (for IEC)	0.05
Curve 6 Reset Time	INSTANTANEOUS

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FLEXCURVE A

FLEXCURVE A

Curve A Trip Time At 1.03 x PU	0 ms
Curve A Trip Time At 1.05 x PU	0 ms
Curve A Trip Time At 1.1 x PU	0 ms
Curve A Trip Time At 1.2 x PU	0 ms
Curve A Trip Time At 1.3 x PU	0 ms
Curve A Trip Time At 1.4 x PU	0 ms
Curve A Trip Time At 1.5 x PU	0 ms
Curve A Trip Time At 1.6 x PU	0 ms
Curve A Trip Time At 1.7 x PU	0 ms
Curve A Trip Time At 1.8 x PU	0 ms
Curve A Trip Time At 1.9 x PU	0 ms
Curve A Trip Time At 2.0 x PU	0 ms
Curve A Trip Time At 2.1 x PU	0 ms
Curve A Trip Time At 2.2 x PU	0 ms
Curve A Trip Time At 2.3 x PU	0 ms
Curve A Trip Time At 2.4 x PU	0 ms
Curve A Trip Time At 2.5 x PU	0 ms
Curve A Trip Time At 2.6 x PU	0 ms
Curve A Trip Time At 2.7 x PU	0 ms
Curve A Trip Time At 2.8 x PU	0 ms
Curve A Trip Time At 2.9 x PU	0 ms
Curve A Trip Time At 3.0 x PU	0 ms
Curve A Trip Time At 3.1 x PU	0 ms
Curve A Trip Time At 3.2 x PU	0 ms
Curve A Trip Time At 3.3 x PU	0 ms
Curve A Trip Time At 3.4 x PU	0 ms
Curve A Trip Time At 3.5 x PU	0 ms
Curve A Trip Time At 3.6 x PU	0 ms
Curve A Trip Time At 3.7 x PU	0 ms
Curve A Trip Time At 3.8 x PU	0 ms
Curve A Trip Time At 3.9 x PU	0 ms
Curve A Trip Time At 4.0 x PU	0 ms
Curve A Trip Time At 4.1 x PU	0 ms
Curve A Trip Time At 4.2 x PU	0 ms
Curve A Trip Time At 4.3 x PU	0 ms
Curve A Trip Time At 4.4 x PU	0 ms
Curve A Trip Time At 4.5 x PU	0 ms
Curve A Trip Time At 4.6 x PU	0 ms
Curve A Trip Time At 4.7 x PU	0 ms
Curve A Trip Time At 4.8 x PU	0 ms
Curve A Trip Time At 4.9 x PU	0 ms
Curve A Trip Time At 5.0 x PU	0 ms

Curve A Trip Time At 5.1 x PU	0 ms
Curve A Trip Time At 5.2 x PU	0 ms
Curve A Trip Time At 5.3 x PU	0 ms
Curve A Trip Time At 5.4 x PU	0 ms
Curve A Trip Time At 5.5 x PU	0 ms
Curve A Trip Time At 5.6 x PU	0 ms
Curve A Trip Time At 5.7 x PU	0 ms
Curve A Trip Time At 5.8 x PU	0 ms
Curve A Trip Time At 5.9 x PU	0 ms
Curve A Trip Time At 6.0 x PU	0 ms
Curve A Trip Time At 6.5 x PU	0 ms
Curve A Trip Time At 7.0 x PU	0 ms
Curve A Trip Time At 7.5 x PU	0 ms
Curve A Trip Time At 8.0 x PU	0 ms
Curve A Trip Time At 8.5 x PU	0 ms
Curve A Trip Time At 9.0 x PU	0 ms
Curve A Trip Time At 9.5 x PU	0 ms
Curve A Trip Time At 10.0 x PU	0 ms
Curve A Trip Time At 10.5 x PU	0 ms
Curve A Trip Time At 11.0 x PU	0 ms
Curve A Trip Time At 11.5 x PU	0 ms
Curve A Trip Time At 12.0 x PU	0 ms
Curve A Trip Time At 12.5 x PU	0 ms
Curve A Trip Time At 13.0 x PU	0 ms
Curve A Trip Time At 13.5 x PU	0 ms
Curve A Trip Time At 14.0 x PU	0 ms
Curve A Trip Time At 14.5 x PU	0 ms
Curve A Trip Time At 15.0 x PU	0 ms
Curve A Trip Time At 15.5 x PU	0 ms
Curve A Trip Time At 16.0 x PU	0 ms
Curve A Trip Time At 16.5 x PU	0 ms
Curve A Trip Time At 17.0 x PU	0 ms
Curve A Trip Time At 17.5 x PU	0 ms
Curve A Trip Time At 18.0 x PU	0 ms
Curve A Trip Time At 18.5 x PU	0 ms
Curve A Trip Time At 19.0 x PU	0 ms
Curve A Trip Time At 19.5 x PU	0 ms
Curve A Trip Time At 20.0 x PU	0 ms

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FLEXCURVE B

FLEXCURVE B

Curve B Trip Time At 1.03 x PU	0 ms
Curve B Trip Time At 1.05 x PU	0 ms
Curve B Trip Time At 1.1 x PU	0 ms
Curve B Trip Time At 1.2 x PU	0 ms
Curve B Trip Time At 1.3 x PU	0 ms
Curve B Trip Time At 1.4 x PU	0 ms
Curve B Trip Time At 1.5 x PU	0 ms
Curve B Trip Time At 1.6 x PU	0 ms
Curve B Trip Time At 1.7 x PU	0 ms
Curve B Trip Time At 1.8 x PU	0 ms
Curve B Trip Time At 1.9 x PU	0 ms
Curve B Trip Time At 2.0 x PU	0 ms
Curve B Trip Time At 2.1 x PU	0 ms
Curve B Trip Time At 2.2 x PU	0 ms
Curve B Trip Time At 2.3 x PU	0 ms
Curve B Trip Time At 2.4 x PU	0 ms
Curve B Trip Time At 2.5 x PU	0 ms
Curve B Trip Time At 2.6 x PU	0 ms
Curve B Trip Time At 2.7 x PU	0 ms
Curve B Trip Time At 2.8 x PU	0 ms
Curve B Trip Time At 2.9 x PU	0 ms
Curve B Trip Time At 3.0 x PU	0 ms
Curve B Trip Time At 3.1 x PU	0 ms
Curve B Trip Time At 3.2 x PU	0 ms
Curve B Trip Time At 3.3 x PU	0 ms
Curve B Trip Time At 3.4 x PU	0 ms
Curve B Trip Time At 3.5 x PU	0 ms
Curve B Trip Time At 3.6 x PU	0 ms
Curve B Trip Time At 3.7 x PU	0 ms
Curve B Trip Time At 3.8 x PU	0 ms
Curve B Trip Time At 3.9 x PU	0 ms
Curve B Trip Time At 4.0 x PU	0 ms
Curve B Trip Time At 4.1 x PU	0 ms
Curve B Trip Time At 4.2 x PU	0 ms
Curve B Trip Time At 4.3 x PU	0 ms
Curve B Trip Time At 4.4 x PU	0 ms
Curve B Trip Time At 4.5 x PU	0 ms
Curve B Trip Time At 4.6 x PU	0 ms
Curve B Trip Time At 4.7 x PU	0 ms
Curve B Trip Time At 4.8 x PU	0 ms
Curve B Trip Time At 4.9 x PU	0 ms
Curve B Trip Time At 5.0 x PU	0 ms

Curve B Trip Time At 5.1 x PU	0 ms
Curve B Trip Time At 5.2 x PU	0 ms
Curve B Trip Time At 5.3 x PU	0 ms
Curve B Trip Time At 5.4 x PU	0 ms
Curve B Trip Time At 5.5 x PU	0 ms
Curve B Trip Time At 5.6 x PU	0 ms
Curve B Trip Time At 5.7 x PU	0 ms
Curve B Trip Time At 5.8 x PU	0 ms
Curve B Trip Time At 5.9 x PU	0 ms
Curve B Trip Time At 6.0 x PU	0 ms
Curve B Trip Time At 6.5 x PU	0 ms
Curve B Trip Time At 7.0 x PU	0 ms
Curve B Trip Time At 7.5 x PU	0 ms
Curve B Trip Time At 8.0 x PU	0 ms
Curve B Trip Time At 8.5 x PU	0 ms
Curve B Trip Time At 9.0 x PU	0 ms
Curve B Trip Time At 9.5 x PU	0 ms
Curve B Trip Time At 10.0 x PU	0 ms
Curve B Trip Time At 10.5 x PU	0 ms
Curve B Trip Time At 11.0 x PU	0 ms
Curve B Trip Time At 11.5 x PU	0 ms
Curve B Trip Time At 12.0 x PU	0 ms
Curve B Trip Time At 12.5 x PU	0 ms
Curve B Trip Time At 13.0 x PU	0 ms
Curve B Trip Time At 13.5 x PU	0 ms
Curve B Trip Time At 14.0 x PU	0 ms
Curve B Trip Time At 14.5 x PU	0 ms
Curve B Trip Time At 15.0 x PU	0 ms
Curve B Trip Time At 15.5 x PU	0 ms
Curve B Trip Time At 16.0 x PU	0 ms
Curve B Trip Time At 16.5 x PU	0 ms
Curve B Trip Time At 17.0 x PU	0 ms
Curve B Trip Time At 17.5 x PU	0 ms
Curve B Trip Time At 18.0 x PU	0 ms
Curve B Trip Time At 18.5 x PU	0 ms
Curve B Trip Time At 19.0 x PU	0 ms
Curve B Trip Time At 19.5 x PU	0 ms
Curve B Trip Time At 20.0 x PU	0 ms

Type: SR750
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PHASE PROTECTION

PHASE TIME OVERCURRENT

Phase Time O/C Function	TRIP
Phase Time O/C Relays (3-7)	-----
Phase Time O/C Curve	CURVE 2
Phase Time O/C Voltage Restraint	DISABLED

PHASE LOSET OVERCURRENT

Phase Loset O/C Function	DISABLED
Phase Loset O/C Relays (3-7)	-----
Phase Loset O/C Pickup	20.00 x CT
Phase Loset O/C Delay	0.00 s
Phases Required for Operation	ANY ONE

PHASE HISET OVERCURRENT

Phase Hiset O/C Function	TRIP
Phase Hiset O/C Relays (3-7)	-4---
Phase Hiset O/C Pickup	15.00 x CT
Phase Hiset O/C Delay	0.00 s
Phases Required for Operation	ANY ONE

PHASE DIRECTIONAL

Phase Directional Function	DISABLED
Phase Directional Relays (3-7)	-----
Phase Directional MTA	30 ½
All Phase O/C Upon VT Failure	DISABLED

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GROUND PROTECTION

GROUND TIME OVERCURRENT

Ground Time O/C Function	DISABLED
Ground Time O/C Relays (3-7)	-----
Ground Time O/C Curve	CURVE 2

GROUND LOSET OVERCURRENT

Ground Loset O/C Function	DISABLED
Ground Loset O/C Relays (3-7)	-----
Ground Loset O/C Pickup	1.00 x CT
Ground Loset O/C Delay	0.00 s

GROUND HISET OVERCURRENT

Ground Hiset O/C Function	TRIP
Ground Hiset O/C Relays (3-7)	--5--
Ground Hiset O/C Pickup	0.10 x CT
Ground Hiset O/C Delay	0.75 s

GROUND DIRECTIONAL

Ground Directional Function	DISABLED
Ground Directional Relays (3-7)	-----
Ground Polarization	VOLTAGE
Ground Directional MTA	315 ½
Minimum Polarizing Voltage	0.05 x VT
All Ground O/C Upon VT Failure	DISABLED

NEUTRAL TIME OVERCURRENT

Neutral Time O/C Function	DISABLED
Neutral Time O/C Relays (3-7)	-----
Neutral Time O/C Curve	CURVE 1

NEUTRAL LOSET OVERCURRENT

Neutral Loset O/C Function	DISABLED
Neutral Loset O/C Relays (3-7)	-----
Neutral Loset O/C Pickup	1.00 x CT
Neutral Loset O/C Delay	0.00 s

NEUTRAL HISET OVERCURRENT

Neutral Hiset O/C Function	DISABLED
Neutral Hiset O/C Relays (3-7)	-----
Neutral Hiset O/C Pickup	10.00 x CT
Neutral Hiset O/C Delay	0.00 s

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FEATURE BLOCKING

MANUAL CLOSE FEATURE BLOCKING

Manual Close Function	DISABLED
Manual Close Relays (3-7)	-----
Phase Loset O/C Blocked Time	0 s
Phase Hiset O/C Blocked Time	0.0 s
Ground Loset O/C Blocked Time	0 s
Neutral Hiset O/C Blocked Time	0.0 s
Neutral Loset O/C Blocked Time	0 s
Ground Hiset O/C Blocked Time	0.0 s
Phase Time O/C Raised Time	0 s
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 s
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 s
Neutral Time O/C Raised Pickup	0 %

COLD LOAD PICKUP

Cold Load Pickup Function	DISABLED
Cold Load Pickup Relays (3-7)	-----
Outage Time Before Cold Load	100 min
Phase Loset O/C Blocked Time	0 s
Phase Hiset O/C Blocked Time	0.0 s
Ground Loset O/C Blocked Time	0 s
Ground Hiset O/C Blocked Time	0.0 s
Neutral Loset O/C Blocked Time	0 s
Neutral Hiset O/C Blocked Time	0.0 s
Phase Time O/C Raised Time	0 s
Phase Time O/C Raised Pickup	0 %
Ground Time O/C Raised Time	0 s
Ground Time O/C Raised Pickup	0 %
Neutral Time O/C Raised Time	0 s
Neutral Time O/C Raised Pickup	0 %

Type: SR750
Revision: F1.60
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Comment:
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VOLTAGE

BUS UNDERVOLTAGE 1

Bus Undervoltage 1 Function	DISABLED
Bus Undervoltage 1 Relays (3-7)	3----
Bus Undervoltage 1 Pickup	0.92 x VT
Bus Undervoltage 1 Delay	2.0 s
Phases Required for Operation	ANY ONE
Minimum Operating Voltage	0.00 x VT
Bus Undervoltage 1 Curve	DEFINITE TIME

BUS UNDERVOLTAGE 2

Bus Undervoltage 2 Function	DISABLED
Bus Undervoltage 2 Relays (3-7)	-----
Bus Undervoltage 2 Pickup	0.75 x VT
Bus Undervoltage 2 Delay	2.0 s
Phases Required for Operation	ALL THREE
Minimum Operating Voltage	0.30 x VT
Bus Undervoltage 2 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 3

Line Undervoltage 3 Function	DISABLED
Line Undervoltage 3 Relays (3-7)	-----
Line Undervoltage 3 Pickup	0.75 x VT
Line Undervoltage 3 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 3 Curve	DEFINITE TIME

LINE UNDERVOLTAGE 4

Line Undervoltage 4 Function	DISABLED
Line Undervoltage 4 Relays (3-7)	-----
Line Undervoltage 4 Pickup	0.75 x VT
Line Undervoltage 4 Delay	2.0 s
Minimum Operating Voltage	0.30 x VT
Line Undervoltage 4 Curve	DEFINITE TIME

OVERVOLTAGE 1

Overvoltage 1 Function	DISABLED
Overvoltage 1 Relays (3-7)	-----
Overvoltage 1 Pickup	1.25 x VT
Overvoltage 1 Delay	2.0 s
Phases Required for Operation	ALL THREE

OVERVOLTAGE 2

Overvoltage 2 Function	DISABLED
------------------------	----------

Overvoltage 2 Relays (3-7)

Overvoltage 2 Pickup

1.25 x VT

Overvoltage 2 Delay

2.0 s

Phases Required for Operation

ALL THREE

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

UNDERFREQUENCY

UNDERFREQUENCY 1

Underfrequency 1 Function	DISABLED
Underfrequency 1 Relays (3-7)	-----
Underfrequency 1 Pickup	59.00 Hz
Underfrequency 1 Delay	2.00 s
Minimum Operating Voltage	0.50 x VT

UNDERFREQUENCY 2

Underfrequency 2 Function	DISABLED
Underfrequency 2 Relays	-----
Underfrequency 2 Pickup	58.00 Hz
Underfrequency 2 Delay	3.00 s
Minimum Operating Voltage	0.70 x VT

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

TRANSFER

TRANSFER

Transfer Function	DISABLED
Transfer Delay This Source	1.0 s
Transfer Delay Other Source	3.0 s

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

CURRENT LEVEL

PHASE CURRENT LEVEL

Phase Current Level Function	DISABLED
Phase Current Level Relays (3-7)	-----
Phase Current Level Pickup	1.10 x CT
Phase Current Level Delay	2 s

GROUND CURRENT LEVEL

Ground Current Level Function	DISABLED
Ground Current Level Relays (3-7)	-----
Ground Current Level Pickup	1.10 x CT
Ground Current Level Delay	2 s

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

POWER FACTOR

POWER FACTOR 1

Power Factor 1 Function	DISABLED
Power Factor 1 Relays	-----
Power Factor 1 Pickup	0.80 Lag
Power Factor 1 Dropout	1.00
Power Factor 1 Delay	50 s

POWER FACTOR 2

Power Factor 2 Function	DISABLED
Power Factor 2 Relays	-----
Power Factor 2 Pickup	0.80 Lag
Power Factor 2 Dropout	1.00
Power Factor 2 Delay	50 s

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

SYNCHROCHECK

SYNCHROCHECK

Synchrocheck Function	DISABLED
Synchrocheck Relays	-----
Dead Source Permissive	OFF
Dead Bus Maximum Voltage	0.20 x VT
Dead line Maximum Voltage	0.20 x VT
Minimum Bus Voltage	0.80 x VT
Minimum Line Voltage	0.80 x VT
Maximum Voltage Difference	2.0 kV
Maximum Angle Difference	24 ½
Maximum Frequency Difference	2.00 Hz

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:44

FAULT LOCATOR

FAULT LOCATOR

Length Of Feeder	0.1 Units
Units Of Length	km
Zpos (Resistive) Of Feeder	0.01 Ohms
Zpos (Inductive) Of Feeder	0.01 Ohms
Zzero (Resistive) Of Feeder	0.01 Ohms
Zzero (Inductive) Of Feeder	0.01 Ohms

Type: SR750
Revision: Fl.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:45

DEMAND

CURRENT DEMAND

Current Demand Function	DISABLED
Measurement Type	THERMAL EXPONENTIAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Current Demand Relays	-----
Current Demand Pickup	1000 A

REAL POWER DEMAND

Real Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Real Power Demand Relays	-----
Real Power Demand Pickup	10.0 MW

REACTIVE POWER DEMAND

Reactive Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Reactive Power Demand Relays	-----
Reactive Power Demand Pickup	10.0 Mvar

APPARENT POWER DEMAND

Apparent Power Demand Function	DISABLED
Measurement Type	BLOCK INTERVAL
Thermal 90% Response Time	15 min
Time Interval	20 min
Apparent Power Demand Relays	-----
Apparent Power Demand Pickup	10.0 MVA

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:45

ANALOG INPUT

ANALOG INPUT SETUP

ANALOG INPUT NAME	ANALOG INPUT
Analog Input Units	uA
Analog Input Range	0-20 mA
Analog Input Minimum Value	0 Units
Analog Input Maximum Value	20000 Units

ANALOG THRESHOLD 1

Analog Threshold 1 Function	DISABLED
Analog Threshold 1 Relays (3-7)	-----
Analog Threshold 1 Pickup	10 Units
Analog Threshold 1 Delay	50 s

ANALOG THRESHOLD 2

Analog Threshold 2 Function	DISABLED
Analog Threshold 2 Relays (3-7)	-----
Analog Threshold 2 Pickup	100 Units
Analog Threshold 2 Delay	100 s

ANALOG RATE OF CHANGE 1

Analog In Rate 1 Function	DISABLED
Analog In Rate 1 Relays (3-7)	-----
Analog In Rate 1 Pickup	10.0 Units/hr
Analog In Rate 1 Delay	0 s

ANALOG RATE OF CHANGE 2

Analog In Rate 2 Function	DISABLED
Analog In Rate 2 Relays (3-7)	-----
Analog In Rate 2 Pickup	10.0 Units/hr
Analog In Rate 2 Delay	0 s

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:45

ANALOG OUTPUTS

ANALOG OUTPUT 1	
Analog Output 1 Parameter	DISABLED
ANALOG OUTPUT 2	
Analog Output 2 Parameter	DISABLED
ANALOG OUTPUT 3	
Analog Output 3 Parameter	DISABLED
ANALOG OUTPUT 4	
Analog Output 4 Parameter	DISABLED
ANALOG OUTPUT 5	
Analog Output 5 Parameter	DISABLED
ANALOG OUTPUT 6	
Analog Output 6 Parameter	DISABLED
ANALOG OUTPUT 7	
Analog Output 7 Parameter	DISABLED
ANALOG OUTPUT 8	
Analog Output 8 Parameter	DISABLED

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:45

OVERFREQUENCY

OVERFREQUENCY

Overfrequency Function	DISABLED
Overfrequency Relays (3-7)	-----
Overfrequency Pickup	61.00 Hz
Overfrequency Delay	2.0 s

Type: SR750
Revision: F1.60
File Name: SPARE
Comment:
Date: Mon Jan 27, 1997
Time: 17:46:45

EQUIPMENT

TRIP COUNTER

Trip Counter Function	DISABLED
Trip Counter Relays (3-7)	----
Trip Counter Limit	10000 Trips

TOTAL ARCING CURRENT

Total Arcing Current Function	DISABLED
Total Arcing Current Relays (3-7)	----
Total Arcing Current Start Delay	32 ms
Total Arcing Current Limit	1000 kA»-cyc

BREAKER FAILURE

Breaker Failure Function	DISABLED
Breaker Failure Relays (3-7)	----
Breaker Failure Delay	0.10 s
Breaker Failure Current	1.00 x CT

VT FAILURE

VT Failure Function	DISABLED
VT Failure Relays (3-7)	----
VT Failure Delay	10 s

BREAKER OPERATION

Breaker Operation Function	DISABLED
Breaker Operation Relays (3-7)	----
Breaker Operation Delay	0.10 s

TRIP COIL MONITOR

Trip Coil Monitor Function	DISABLED
Trip Coil Monitor Relays (3-7)	----
Open Breaker Permissive	DISABLED

CLOSE COIL MONITOR

Close Coil Monitor Function	DISABLED
Close Coil Monitor Relays (3-7)	----
Closed Breaker Permissive	DISABLED

CURRENT TRANSFORMERS,
POTENTIAL TRANSFORMERS,
AND METERS

TEST DATA SHEET



CURRENT TRANSFORMER

TEST DATA SHEET

LOCATION	PHASE	TEST CURRENT (Amps)	OUTPUT CURRENT (Amps)	RATIO TESTED	RATIO SPEC	POLARITY
2.4KV SWGR CELL 1A SPARE	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4 KV SWGR CELL 1B MINI SUB	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4KV SWGR CELL 2A SPARE	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4 KV SWGR CELL 2B MCC	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4 KV SWGR CELL 3A FUTURE	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4KV SWGR CELL 4A FAN #1	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	G	20	2.0	50:5	50:5	OK
2.4KV SWGR CELL 5A MAIN #1	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	① G	20	2.0	50:5	50:5	OK
2.4KV SWGR CELL 8A MAIN #2	A	120	1.0	600:5	600:5	OK
	B	120	1.0	600:5	600:5	OK
	C	120	1.0	600:5	600:5	OK
	① G	20	2.0	50:5	50:5	OK
MAIN #1 METERING	A	80	1.0	400:5	400:5	OK (2)
	C	80	1.0	400:5	400:5	OK (2)
MAIN #2 METERING	A	80	1.0	400:5	400:5	OK (2)
	C	80	1.0	400:5	400:5	OK (2)

COMMENTS: PHASE G = GROUND FAULT BYZ CT.

① 2 GROUND FAULT CURRENT TRANSFORMERS WIRED IN PARALLEL

② CORRECTED SECONDARY WIRING AT TERMINAL BLOCK FOR PROPER POLARITY

TESTED BY: L.R. McFARLAND

DATE: 12-13-96

Westinghouse

Engineering Service

Seattle, Wa.

(206) 656-4380

TEST DATA SHEET



CURRENT TRANSFORMER

TEST DATA SHEET

[illegible]

COMMENTS: ③ NO GROUND FAULT C.T. (NOT NEEDED)

TESTED BY: L.K. McFARLAND

DATE: 12-12-96

(206) 656-4380

DATE: 1-8-97

Westinghouse

Engineering Service

Seattle, Wa.

(206) 656-4380

TEST DATA SHEET



METER CALIBRATION RECORD

CUSTOMER US DEPARTMENT OF ENERGYJOB NO. SEEG403PLANT OR VESSEL PUREX PROJECT

PANEL	2.4KV SWGR		2.4KV SWGR		2.4KV SWGR		2.4KV SWGR	
METER	5A MAIN #1		1B MINISUB		2B MCC		8A MAIN#2	
N.P.	0-3000V		0-3000V		0-3000V		0-3000V	
INFO.								
	Standard	Meter	Standard	Meter	Standard	Meter	Standard	Meter
	600	580	600	590	600	600	600	600
	1500	1470	1500	1500	1500	1500	1500	1480
	2400	2390	2400	2410	2400	2400	2400	2390
	3000	2990	3000	3000	3000	2990	3000	3000

NOTES

ENGINEER L.K. McFARLANDDATE 1-16-97

a:\metercal

Westinghouse
Engineering Service
Seattle, Wa.
(206) 656-4380

TEST DATA SHEET



METER CALIBRATION RECORD

CUSTOMER US DEPARTMENT OF ENERGYJOB NO. SEEG 403PLANT OR VESSEL PUREX PROJECT

PANEL	24KV SWGR		24KV SWGR		MINI SVB			
METER	9B MINI SVB		10B MINI SVB		480V MCC			
N.P.	0-3000 V		0-3000V		0-600V			
INFO.	(2)		(1)					
	Standard	Meter	Standard	Meter	Standard	Meter	Standard	Meter
	600	METER STICKS	600	310	120	122		
	1500		1500	1200	300	300		
	2400		2400	2100	480	478		
	3000		3000	2700	600	596		

NOTES *

① METER READINGS OUT OF TOLERANCE RECOMMEND REPLACEMENT.

② METER STICKS RECOMMEND REPLACEMENT.

ENGINEER L.R. McFARLANDDATE 1-16-97

a:lnmetercal

* Replacement meters installed 3/21/97
JEN

Westinghouse

Engineering Service

Seattle, Wa.

(206) 656-4380

TEST DATA SHEET



METER CALIBRATION RECORD

CUSTOMER US DEPARTMENT OF ENERGYJOB NO. SEEG 403PLANT OR VESSEL PUREX PROJECT

PANEL	2.4 KV SWGR		2.4KV SWGR		MAIN SUB			
METER	5A MAIN #1		8A MAIN #2		480V MCL			
N.P.	0-600 AMP		0-600 AMP		0-1200 AMP			
INFO.								
	Standard	Meter	Standard	Meter	Standard	Meter	Standard	Meter
	120	118	120	118	240	240		
	240	237	240	238	480	490		
	360	355	360	360	720	740		
	480	479	480	480	960	990		
	600	600	600	600	1200	1240		

NOTES

ENGINEER L. K. McFARLANDDATE 1-16-97

a:\metercal

750 KVA TRANSFORMERS



DRY TRANSFORMER TEST SUMMARY

FORM SW10

CUSTOMER <u>US DEPARTMENT OF ENERG</u>		JOB NO. <u>SEEG 403</u>	
DESIGNATION <u>T1</u>		LOCATION <u>PUREX PROJECT, RICHLAND, WA</u>	
MANUFACTURER <u>VIRGINIA TRANSFORMER</u>		ENGINEER/DATE <u>L.K. MCFARLAND 12/19/96</u>	
SERIAL/S.O. NO. <u>320750E503-8221</u>		KVA <u>750</u>	
IMPEDANCE <u>5.76</u>	PHASE <u>3</u>	PRIMARY <u>2400</u> V	SECONDARY <u>480</u> V
PRIMARY BIL <u>30</u> KV		SECONDARY BIL <u>10</u> KV	

TAP SETTING FOUND <u>3</u>	VECTOR DIAGRAM
TAP SETTING LEFT <u>3</u>	
CASE GROUND <u>N/A</u>	
OHMS	
AMBIENT <u>7</u>	
DEG. C	
WINDING TEMP <u>7</u>	
DEG. C	

VISUAL/MECHANICAL INSPECTION

PHYSICAL CONDITION	<u>OK</u>	GROUNDING CONN.	<u>OK</u>
NAMEPLATE DATA CORRECT	<u>OK</u>	BRACING	<u>OK</u>
AUX/ DEVICE OPERATION	<u>OK</u>	CLEANLINESS	<u>OK</u>
ELECTRICAL CONNECTIONS	<u>OK</u>	INSULATORS	<u>OK</u>
CORE BOLTS	<u>OK</u>	IRON (VISUAL)	<u>OK</u>
FRAME BOLTS	<u>OK</u>		
ANCHORING	<u>OK</u>		

INSULATION RESISTANCE

	HI to LO & GND.	LO to HI & GND.	HI & LO to GND.	
TEST VOLTAGE	<u>2500 VDC</u>	<u>1000 VDC</u>	<u>1000 VDC</u>	
(MEGOHMS)	<u>5000</u>	<u>400</u>	<u>500</u>	

ADDITIONAL WORK OR TESTS DONE:

<u>TEMPERATURE RELAY SET POINTS</u>	<u>FANS 180°C</u>
	<u>ALARM 190°C</u>
	<u>TRIP 201°C</u>

TEST DATA SHEET



DRY TRANSFORMER TEST SUMMARY

FORM SW10

CUSTOMER <i>VS DEPARTMENT OF ENERGY</i>		JOB NO. <i>SEEG 403</i>	
DESIGNATION <i>T2</i>		LOCATION <i>PUREX PROJECT, RICHLAND, WA</i>	
MANUFACTURER <i>VIRGINIA TRANSFORMER</i>		ENGINEER/DATE <i>L.K. MCFARLAND</i>	
SERIAL/S.O. NO. <i>320750E503-8221B</i>		KVA <i>750</i>	
IMPEDANCE <i>5.58</i>	PHASE <i>3</i>	PRIMARY <i>2400</i> V	SECONDARY <i>480</i> V
PRIMARY BIL <i>30</i> KV		SECONDARY BIL <i>10</i> KV	

TAP SETTING FOUND	3	VECTOR DIAGRAM
TAP SETTING LEFT	3	
CASE GROUND	N/A	
AMBIENT	7	
WINDING TEMP	7	
		OHMS
		DEG. C
		DEG. C

VISUAL/MECHANICAL INSPECTION

PHYSICAL CONDITION	OK	GROUNDING CONN.	OK
NAMEPLATE DATA CORRECT	OK	BRACING	OK
AUX/ DEVICE OPERATION	OK	CLEANLINESS	OK
ELECTRICAL CONNECTIONS	OK	INSULATORS	OK
CORE BOLTS	OK	IRON (VISUAL)	OK
FRAME BOLTS	OK		
ANCHORING	OK		

INSULATION RESISTANCE

	HI to LO & GND.	LO to HI & GND.	HI & LO to GND.	
TEST VOLTAGE	2500 VDC	1000 VDC	1000 VDC	
(MEG OHMS)	5000	500	600	

ADDITIONAL WORK OR TESTS DONE:

TEMPERATURE RELAY SET POINTS FANS 180°C

ALARM 190°C

TRIP 201°C

TEST DATA SHEET



DRY TRANSFORMER TEST SUMMARY

FORM SW10

CUSTOMER <u>US DEPARTMENT OF ENERG</u>	JOB NO. <u>SEEG 403</u>
DESIGNATION <u>T3</u>	LOCATION <u>PUREX PROJECT, RICHLAND, WA</u>
MANUFACTURER <u>VIRGINIA TRANSFORMER</u>	ENGINEER/DATE <u>L.K. MCFARLAND 1-12-97</u>
SERIAL/S.O. NO. <u>320750E503-8221</u>	KVA <u>750</u>
IMPEDANCE <u>5.72</u> PHASE <u>3</u>	PRIMARY <u>2400</u> V SECONDARY <u>480</u> V
PRIMARY BIL <u>30</u> KV	SECONDARY BIL <u>10</u> KV

TAP SETTING FOUND <u>3</u>	VECTOR DIAGRAM
TAP SETTING LEFT <u>3</u>	
CASE GROUND <u>N/A</u> OHMS	
AMBIENT <u>5</u> DEG. C	
WINDING TEMP <u>5</u> DEG. C	

VISUAL/MECHANICAL INSPECTION

PHYSICAL CONDITION	<u>OK</u>	GROUNDING CONN.	<u>OK</u>
NAMEPLATE DATA CORRECT	<u>OK</u>	BRACING	<u>OK</u>
AUX/ DEVICE OPERATION	<u>OK</u>	CLEANLINESS	<u>OK</u>
ELECTRICAL CONNECTIONS	<u>OK</u>	INSULATORS	<u>OK</u>
CORE BOLTS	<u>OK</u>	IRON (VISUAL)	<u>OK</u>
FRAME BOLTS	<u>OK</u>		
ANCHORING	<u>OK</u>		

INSULATION RESISTANCE

	HI to LO & GND.	LO to HI & GND.	HI & LO to GND.	
TEST VOLTAGE	<u>2500 VDC</u>	<u>1000 VDC</u>	<u>1000 VDC</u>	
(MEGOHMS)	<u>8000</u>	<u>4</u>	<u>2</u>	

ADDITIONAL WORK OR TESTS DONE:

<u>TEMPERATURE RELAY SET POINTS</u>	<u>FANS</u>	<u>180°C</u>
	<u>ALARM</u>	<u>190°C</u>
	<u>TRIP</u>	<u>200°C</u>

480 VOLT MOTOR CONTROL
CENTERS



TEST DATA SHEET

SWITCHGEAR INSPECTION AND TEST

Form SW2

Customer: <u>US DEPARTMENT OF ENERGY</u>	Location: <u>HANFORD WA</u>	Job No.: <u>SEEG 403</u>
Bus I.D.: <u>BLOG 1 MCL</u>	Feeder I.D.: <u> </u>	S.N.: <u> </u>
Manufacturer: <u>GH/WESTINGHOUSE</u>	Type: <u>FREEDOM 200</u>	
Voltage: <u>480 V</u>	Bus Amps: <u>2000</u>	Structure Amps: <u>1200 ②</u>
Engineer: <u>LKM</u>		Date: <u>1-23-97</u>

	AS FOUND CONDITION	COMMENTS
Paint finish - inside & out	OK	
Alignment, leveling, anchoring	OK	
Hardware	OK	
Bus insulation	OK	
Corona/tracking	NONE	
Bus joint insulation	OK	
Bus or cable taping	OK	
Potheads/stress cones	N/A	
Bus supports	OK	
Ground bus and structure gnd.	OK	
Stationary contact bottles	N/A	
Shutter and operator	N/A	
Cell racking	N/A	
Terminal, fuse blocks and fuses	OK	
Heaters	N/A	
Auxiliary control devices	N/A	
Control wiring general condition	N/A	
Pilot lights and instr. function	N/A	
Brk., meter cont. sw., cell sw.	OK ③	
Cell heaters	N/A	No. Voltage
Key interlocks	N/A ④	Mfg. Key no.
Test position operation	N/A	
C.B. operation by relays	N/A	
Insulation resistance ①	A-B line N/A load N/A	A-Gnd. line N/A load N/A
in megohms	B-C line N/A load N/A	B-Gnd. line N/A load N/A
@ volts	C-A line N/A load N/A	G-Gnd. line N/A load N/A

- Notes: ① BUS ENERGIZED BY BACKFEED, PREVENT INSULATION TEST
 ② VERTICAL SECTION AMPS
 ③ MAIN BREAKER GROUND FAULT SCHEME REQUIRES REVISION
 ④ RECOMMEND KEY INTERLOCK ON TIE+ MAINS



TEST DATA SHEET

SWITCHGEAR INSPECTION AND TEST

Form SW2

Customer: <u>US DEPARTMENT OF ENERGY</u>	Location: <u>HANFORD WA</u>	Job No.: <u>SEEG 403</u>
Bus I.D.: <u>MINI SUB</u>	Feeder I.D.: <u> </u>	S.N.: <u> </u>
Manufacturer: <u>CH WESTINGHOUSE</u>	Type: <u>FREEDOM 2100</u>	
Voltage: <u>480V</u>	Bus Amps: <u>2000</u>	Structure Amps: <u>1200 ③</u>
Engineer: <u>LKM</u>		Date: <u>1-23-97</u>

	AS FOUND CONDITION	COMMENTS
Paint finish - inside & out	OK	
Alignment, leveling, anchoring	OK	
Hardware	OK	
Bus insulation	OK	
Corona/tracking	NONE	
Bus joint insulation	OK	
Bus or cable taping	OK	
Potheads/stress cones	N/A	
Bus supports	OK	
Ground bus and structure gnd.	OK	
Stationary contact bottles	N/A	
Shutter and operator	N/A	
Cell racking	N/A	
Terminal, fuse blocks and fuses	OK	
Heaters	N/A	
Auxiliary control devices	OK	LIGHTING CONTACTORS
Control wiring general condition	OK	①
Pilot lights and instr. function	OK	②
Brk., meter cont. sw., cell sw.	OK	
Cell heaters	NONE	No. Voltage
Key interlocks	NONE	Mfg. Key no.
Test position operation	N/A	
C.B. operation by relays	N/A	
Insulation resistance in megohms @ 1000 volts dc	A-B line N/A load B-C line N/A load C-A line N/A load	A-Gnd. line N/A load B-Gnd. line N/A load G-Gnd. line N/A load

- Notes: ① REMOVED GF. FROM LIGHTING CONTACTOR CONTROL CIRCUIT
 ② INDICATING LIGHT IN POSITION 1H REQUIRES REPLACEMENT
 ③ VERTICAL SECTION AMPS
 ④ MAIN NEUTRAL SENSOR INCORRECT POSITION.

2.4 KV MOTOR STARTERS



WESTINGHOUSE ELECTRIC CORPORATION

ELECTRICAL SYSTEMS SERVICES

HNF-SD-CP-ATR-089, REV. 0

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STARTER - MEDIUM VOLTAGE

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND, WA
(W) Job No: SEEG403

Date: JANUARY 14, 1997
Unique No:
Purchase Order:

Nameplate and Settings

Substation: PUREX 2400 VOLT MCC
Feeder: CANYON EXHAUST FAN 1
Manufacturer: C-H/WESTINGHOUSE-AMPGARD
Serial No. NONE
Voltage Rating: 2300/2400
Control Voltage: 120 VAC

Fuse Mfr: C-H/WESTINGHOUSE
Style No.: FUSE 449D597G03
Current Rating: CONTACTOR 360 AMP, FUSE 100(3R) AM
Starter Type: SJA25VW430, MODEL B
IB No.: I.L. 16-200-32C
Cat. No.: VMAN3FN4E1-T1

Inspection:

Contact Cond. and Alignment: A
Arc Chute Condition: N/A
Aux. Contacts and Switch: A
Primary Fingers: A
Insulators / Barriers: A
Racking / Shutter Mech.: A
Mech. Measurements: A
Vacuum Interrupters: A

Control Wiring: A
Isolation Switch: A
Protection Trip: A
Frame Condition: A
Clean Cell: A
Clean Starter: A
Lubrication: A
Fuse Holders: A

CODE LEGEND

A = Like New Condition
B = Good Condition Adjustment Required
C = Poor Condition Requires Correction
D = Corrections Made
E = Unacceptable Condition. Do Not Use!

Test Results

Contact Resistance (Readings in Microhms) A 99 B 91 C 103

Insulation Resistance (Readings in Megohms) @ 5000 Volts DC

Contactor Closed:	A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Contactor Closed:	A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Across Open Contacts:	A-A'	N/A	B-B'	N/A	C-C'	N/A
Power Fuse Resistance:	A	5280	B	5550	C	5570

HIPOT Across Open Vacuum Interrupter Contacts for 1 minute @: 23 KVDC PASS

Motor Protection

Style / Serial No. IQ-1000 PLUS
Motor FLA:

Manufacturer: WESTINGHOUSE
Heater Size: N/A
Service Factor: 1.0

Starter Type: SJA25VW430, M
CT Ratio: 75:5 GF=50:5
Motor Horsepower: 200

Test Current @ 300% of FLA =
Other:

N/A	Amps	A	B	C
	Amps	A	B	C

COMMENTS:

1	
2	

Tested By: L.K. MCFARLAND

Form No: 8.0210.1

STARTER_MEDIUM_VOLTAGE



WESTINGHOUSE ELECTRIC CORPORATION

ELECTRICAL SYSTEMS SERVICES

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STARTER - MEDIUM VOLTAGE

Customer:	US DEPARTMENT OF ENERGY	Date:	JANUARY 14, 1997
Location:	RICHLAND, WA	Unique No:	
(W) Job No:	SEEG403	Purchase Order:	

Nameplate and Settings

Substation:	PUREX 2400 VOLT MCC	Fuse Mfr:	C-H/WESTINGHOUSE
Feeder:	CANYON EXHAUST FAN 2	Style No.:	FUSE 449D597G03
Manufacturer:	C-H/WESTINGHOUSE-AMPGARD	Current Rating:	CONTACTOR 360 AMP, FUSE 100(3R) AM
Serial No.	NONE	Starter Type:	SJA25VW430, MODEL B
Voltage Rating:	2300/2400	IB No.:	I.L. 16-200-32C
Control Voltage	120 VAC	Cat. No.:	VMAN3FN4E1-T1

Inspection:

Contact Cond. and Alignment:	A	Control Wiring:	A
Arc Chute Condition:	N/A	Isolation Switch:	A
Aux. Contacts and Switch:	A	Protection Trip:	A
Primary Fingers:	A	Frame Condition:	A
Insulators / Barriers:	A	Clean Cell:	A
Racking / Shutter Mech. :	A	Clean Starter:	A
Mech. Measurements:	A	Lubrication:	A
Vacuum Interrupters:	A	Fuse Holders:	A

CODE LEGEND

A = Like New Condition
B = Good Condition Adjustment Required
C = Poor Condition Requires Correction
D = Corrections Made
E = Unacceptable Condition. Do Not Use!

Test Results

Contact Resistance (Readings in Microhms)	A	114	B	92	C	98
Insulation Resistance (Readings in Megohms) @	5000	Volts DC				
Contactor Closed:	A-G	> 100,000	B-G	> 100,000	C-G	> 100,000
Contactor Closed:	A-B	> 100,000	B-C	> 100,000	C-A	> 100,000
Across Open Contacts:	A-A'	N/A	B-B'	N/A	C-C'	N/A
Power Fuse Resistance:	A	5240	B	5220	C	5230

HIPOT Across Open Vacuum Interrupter Contacts for 1 minute @: 23 KVDC PASS

Motor Protection

Style / Serial No.	IQ-1000 PLUS	Manufacturer:	WESTINGHOUSE	Starter Type:	SJA25VW430, M
Motor FLA:	49	Heater Size	N/A	CT Ratio:	75:5 GF=50:5
		Service Factor:	1.0	Motor Horsepower:	200

Test Current @ 300% of FLA =	N/A	Amps	A		B		C	
Other:		Amps	A		B		C	

COMMENTS:

1	
2	

Tested By: L.K. MCFARLAND

Form No: 8.0210.1

STARTER_MEDIUM_VOLTAGE



WESTINGHOUSE ELECTRIC CORPORATION

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STARTER - MEDIUM VOLTAGE

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND, WA
(W) Job No: SEEG403

Date: JANUARY 14, 1997
Unique No: FAN3
Purchase Order:

Nameplate and Settings

Substation: PUREX 2400 VOLT MCC
Feeder: CANYON EXHAUST FAN 3
Manufacturer: C-H/WESTINGHOUSE-AMPGARD
Serial No. NONE
Voltage Rating: 2300/2400
Control Voltage: 120 VAC

Fuse Mfr: C-H/WESTINGHOUSE
Style No.: FUSE 449D597G03
Current Rating: CONTACTOR 360 AMP, FUSE 100(3R) AM
Starter Type: SJA25VW430, MODEL B
IB No.: I.L. 16-200-32C
Cat. No.: VMAN3FN4E1-T1

Inspection:

Contact Cond. and Alignment: A
Arc Chute Condition: N/A
Aux. Contacts and Switch: A
Primary Fingers: A
Insulators / Barriers: A
Racking / Shutter Mech. : A
Mech. Measurements: A
Vacuum Interrupters: A

Control Wiring: A
Isolation Switch: A
Protection Trip: A
Frame Condition: A
Clean Cell: A
Clean Starter: A
Lubrication: A
Fuse Holders: A

CODE LEGEND

A = Like New Condition
B = Good Condition Adjustment Required
C = Poor Condition Requires Correction
D = Corrections Made
E = Unacceptable Condition. Do Not Use!

Test Results

Contact Resistance (Readings in Microhms) A 105 B 111 C 108
Insulation Resistance (Readings in Megohms) @ 5000 Volts DC
Contactor Closed: A-G >100,000 B-G >100,000 C-G >100,000
A-B >100,000 B-C >100,000 C-A >100,000
Across Open Contacts: A-A' N/A B-B' N/A C-C' N/A
Power Fuse Resistance: A 5590 B 5570 C 5230

HIPOT Across Open Vacuum Interrupter Contacts for 1 minute @: 23 KVDC PASS

Motor Protection

Style / Serial No. IQ-1000 PLUS
Motor FLA: 49

Manufacturer: WESTINGHOUSE
Heater Size: N/A
Service Factor: 1.0

Starter Type: SJA25VW430, M
CT Ratio: 75:5 GF=50:5
Motor Horsepower: 200

Test Current @ 300% of FLA =
Other:

N/A Amps A B C
Amps A B C

COMMENTS:

1	
2	

Tested By: L.K. MCFARLAND

Form No: 8.0210.1

STARTER_MEDIUM_VOLTAGE

Table 8.B
SET POINT RECORD SHEET

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Program Date 1-24-97 Control Schematic _____
Unit ID/Starter Type FANS #1,2,3 W. Order # SEEG403
MotorHP 200 Mfr. N/A Serial N/A Volts 2300
FLA 49. LRA N/A Stall Time N/A Accel Time N/A
SF 1.0 RTD Type N/A Other _____

Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
0	S VER XX SOFTWARE VERSION NUMBER ³	N/A	N/A	
1	X PHASE SINGLE PHASE TEST MODE OR THREE PHASE PROTECTION MODE	3 PHASE	Toggles between 1 PHASE and 3 PHASE	
2	RTD IN X RTD TEMP IN DEGREES F OR DEGREES C	C	Toggles between RTD IN F and RTD IN C	
3	WD T XXX WINDING TEMP TRIP IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
4	MB T XXX MOTOR BEARING TRIP IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
5	LB T XXX LOAD BEARING TRIP IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
6	AX T XXX AUXILIARY TRIP IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
7	WD A XXX WINDING TEMP ALARM IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
8	MB A XXX MOTOR BEARING ALARM IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
9	LB A XXX LOAD BEARING ALARM IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
10	AX A XXX AUXILIARY ALARM IN DEGREES	0	0-199°C / 32-390°F (1° incre.)	
11	GF XX GROUND FAULT TRIP LEVEL IN AMPS	1	1-12 amps (1 amp. incre.)	12
12	GFSD XX GROUND FAULT START DELAY IN CYCLES	5	1-20 AC cycles (1 cycle incre.)	
13	GFRD XX GROUND FAULT RUN DELAY IN CYCLES	5	0-10 AC cycles (1 cycle incre.)	0
14	IOC XX ENABLE OR DISABLE INSTANTANEOUS OVERCURRENT FUNCTION	OFF	Toggles between IOC ON and IOC OFF displays	IOC OFF
15	IOC XXXX INSTANTANEOUS OVERCURRENT IN % FLA ⁵	—	300-1600% (1% incre.)	

Table 8.B
SET POINT RECORD SHEET
(Cont'd)

HNF-SD-CP-ATR-089, REV. 0
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Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
16	IOCSD XX INSTANTANEOUS OVERCURRENT START DELAY IN CYCLES	—	1-20 cycles (1 cycle incre.)	
17	LRC XXXX LOCKED ROTOR CURRENT IN % FLA	567	300 to 1200% (1% incre.)	
18	LRT XX MAXIMUM ALLOWABLE STALL TIME IN SECONDS	3	1-60 sec. (1 sec. incre.)	
19	UTC XXX ULTIMATE TRIP CURRENT IN % FLA	120	85-125% (1% incre.)	
20	I ² T XXX I ² T ALARM LEVEL IN % I ² T TRIP	75	60-100% (1% incre.)	100
21	MAN RST* AUTO RST* AUTO OR MANUAL I ² T RESET	MAN RST	Toggles between MAN RST and AUTO RST displays	
22	JM A XXXX JAM ALARM LEVEL IN % FLA	150	100-1200% (1% incre.)	1200
23	JM T XXXX JAM TRIP LEVEL IN % FLA	180	100-1200% (1% incre.)	1200 ⁶
24	JAMS XX JAM START DELAY IN SECONDS	3	0-60 sec. (1 sec. incre.)	
25	JAMR XXX JAM RUN DELAY IN SECONDS	1	0-240 sec. (1 sec. incre.)	240
26	UL A XX UNDERLOAD ALARM LEVEL IN % FLA	75	0-90% (1% incre.)	0
27	UL T XX UNDERLOAD TRIP LEVEL IN % FLA	60	0-90% (1% incre.)	0
28	ULSD XXX UNDERLOAD START DELAY IN SECONDS	3	0-100 sec. (1 sec. incre.)	
29	ULRD XX UNDERLOAD RUN DELAY IN SECONDS	10	1-10 sec. (1 sec. incre.)	1
30	PU A XX PHASE UNBALANCE ALARM LEVEL	10	10-50% (1% incre.)	50 ⁶
31	PURD XXX PHASE UNBALANCE ALARM RUN DELAY IN SECONDS	3	0-240 sec. (1 sec. incre.)	
32	I ² T TRIP* 2 SEC* 2 SECOND DELAY OR I ² T TRIP ON PHASE UNBALANCE	2	Toggles between I ² T TRIP and 2 SEC displays	
33	ST/T XX STARTS PER TIME ALLOWED	2	1-10 starts/ time (incre. of 1)	1

Table 8.B
SET POINT RECORD SHEET
(Cont'd)

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Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
34	T/ST X TIME ALLOWED FOR STARTS COUNT IN MINUTES	60	0 to 240 minutes duration (1 minute incr.)	0
35	OP COUNT ⁴ RST OCNT ⁴ RESET FOR OPERATIONS COUNTER	OP COUNT	Toggles between OP COUNT and RST OCNT	OP COUNT
36	RUN TIME ⁴ RST RT ⁴ RESET FOR RUN TIME	RUN TIME	Toggles between RUN TIME and RST RT displays	RUN TIME
37	TRNC XXX MOTOR START TRANSITION CURRENT LEVEL IN % FLA	150	50-150% (1% incre.)	150
38	TRNT XXX MOTOR START TRANSITION TIME IN SECONDS	0	0-240 sec. (1 sec. incre.)	0
39	TRN TOUT ⁴ TRP TOUT ⁴ TRANSITION OR TRIP ON TIME OUT	TRN TOUT	Toggles between TRN TOUT and TRP TOUT displays	TRN TOUT
40	INSQ XX INCOMPLETE SEQUENCE REPORT BACK TIME IN SECONDS	1	1-60 sec. (1 sec. incre.)	
41	ABKS XXX ANTI-BACKSPIN DELAY TIME IN SECONDS	0	0-600 sec.	0
42	FLA XXXX FULL-LOAD AMPS	50	10-3000 amps (1 amp incre.)	
43	FREQ 50 ⁴ FREQ 60 ⁴ 50 OR 60 HERTZ LINE FREQUENCY	60	Toggles between FREQ 50 and FREQ 60 displays	
44	MODE 1 ⁴ MODE 2 ⁴ TRIP MODE 1 — TRIP RELAY ENERGIZES ON TRIP CONDITION ⁴ TRIP MODE 2 — TRIP RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES ON TRIP CONDITION ⁴	MODE 1	Toggles between MODE 1 and MODE 2	
45	NON REV ⁴ REV ⁴ REVERSING OR NONREVERSING STARTER	NON REV	Toggles between REV and NONREV displays	

Table 8.B
SET POINT RECORD SHEET
(Cont'd)

HNF-SD-CP-ATR-089, REV. 0
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Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
46	REM RST ⁴ REM TRIP ⁴ DIF TRIP ⁴ MTR STOP ⁴ RST DBL ⁴ REMOTE INPUT — RST FOR REMOTE RESET — TRIP FOR REMOTE TRIP — DIF TRIP FOR DIFFERENTIAL TRIP — MTR STOP FOR MOTOR STOP DETECTION — RST DBL FOR RESET DISABLE	REM RST	Toggles between REM TRIP, REM RST, DIF TRIP, MTR STOP	
47	MAX XXX ⁴ 4-20 MA MAX OUTPUT — 100 FOR 100 PERCENT FLA — 125 FOR 125 PERCENT FLA — %I2T FOR PERCENT I2T TRIP — WRD FOR MAXIMUM WINDING RTD TEMP	100	Toggles between MAX100, MAX125, MAX%I2T and MAXWRD displays	
48	AUX XXXX TRIP STATE FOR AUX TRIP RELAY	ALL	Toggles between ALL, IOC, I2T, GFLT, JAM, UL, MBT, LBT, WT and REV displays ⁴	
49	TRIP XXX RESET FOR NUMBER OF TRIPS	TRIP CNT	Toggles between TRIP CNT and TRIP RST displays ⁴	TRIP CNT
50	MAX XXX RESET FOR MAXIMUM VALUES	MX RESET	Toggles between MX R-EBL, MX RESET and MX R-DBL displays ⁴	MX R-DBL
51	XXX PGM ENABLE UNIT TO BE PROGRAMMED WHILE MOTOR IS RUNNING	STOP PGM	Toggles between RUN PGM and STOP PGM	
52	X/5 XXXX CT RATIO — X TURNS TO 5	150	Available CT turns: 5 ratios are: 10, 20, 25, 40, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, 4000	

NOTES:

1. The letters X used here represent the setpoint variables.
2. Press the Help pushbutton to initiate the help display of the complete message shown here. The display scrolls right to left.
3. The software version number is used by Westinghouse. There is no selection associated with it. All correspondence with Westinghouse should refer to the specific software version number installed in the IQ-1000 II.
4. One of these choices must be selected.
5. IOC trip setting should be lower than your Fuse Interrupting Rating or your Contactor Withstand Rating.
6. Set start and run delays to maximum values to disable trip/alarm functions.

2.4 KV DISCONNECT
SWITCH



WESTINGHOUSE ELECTRIC CORPORATION

ELECTRICAL SYSTEMS SERVICES

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PRIMARY SWITCH TEST REPORT

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND, WA
(W) Job No: SEEG403

Date: JANUARY 14, 1997
Unique No: MAIN DISCONNECT
Purchase Order:

Nameplate and Settings

Substation: MINI SUB
Feeder: TRANSFORMER DISCONNECT
Manufacturer: C-H/WESTINGHOUSE
Voltage Rating: 4.8 KV

Serial No.:
Style Number: GO No. HSW26522E Item 2A
Current: 600 A
Interrupting Rating: 600 A

Fuses

Fuse Volt Rating: N/A Catalog No.: N/A Current Rating: N/A

Inspection and Adjustments

- ☒ Finish Paint:
☐ Key Interlock: N/A
☒ Operating Mechanism:
☒ Barriers and Insulators:
☒ Arcing Blades and Chutes:
☐ Arresters: NONE

- ☒ Door Interlocks:
☒ Window and Screens:
☐ Fuse Holders: NONE
☒ Bus Insulation:
☒ Main Blade and Jaw
☒ Contacts

Alignment:
Travel / Overtoggle:
Break Jaw:
Blade / Pad:
Open Gap:

Phase "A"	Phase "B"	Phase "C"
<u>OK</u>	<u>OK</u>	<u>OK</u>
<u>OK</u>	<u>OK</u>	<u>OK</u>
<u>OK</u>	<u>OK</u>	<u>OK</u>
<u>OK</u>	<u>OK</u>	<u>OK</u>
<u>OK</u>	<u>OK</u>	<u>OK</u>

Test Results:

Contact Resistance (Readings in Microhms):

Power Fuse Resistance:

Insulation Resistance (Readings in Megohms @):

Phase "A"	Phase "B"	Phase "C"
<u>32</u>	<u>28</u>	<u>35</u>
<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

5000 Volts Ambient Temp. (Degrees C) : -5

Sw Closed ①
Sw Closed ①
Sw Open

A-G N/A
A-B N/A
A-A' 30,000

B-G N/A
B-C N/A
B-B' 10,000

G-G N/A
C-A N/A
C-C' 20,000

COMMENTS:

- ① TRANSFORMER CONNECTED TO LOAD SIDE OF SWITCH, TEST NOT PRACTICAL
-
-

Tested By: L.R. McFARLAND

Form No: 3.0110.

SWITCH_PRIMARY



WESTINGHOUSE ELECTRIC CORPORATION

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PRIMARY SWITCH TEST REPORT

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND, WA
(W) Job No: SEEG403

Date: JANUARY 14, 1997
Unique No: FEEDER 1 (TRANSFER SW)
Purchase Order:

Nameplate and Settings

Substation: MINI SUB
Feeder: TRANSFORMER DISCONNECT
Manufacturer: C-H/WESTINGHOUSE
Voltage Rating: 4.8 KV

Serial No.:
Style Number: GO No. HSW26522E Item 2A
Current: 600 A
Interrupting Rating: NONE

Fuses

Fuse Volt Rating: N/A Catalog No.: N/A Current Rating: N/A

Inspection and Adjustments

- ☒ Finish Paint:
☐ Key Interlock: N/A
☒ Operating Mechanism:
☒ Barriers and Insulators:
☒ Arcing Blades and Chutes:
☐ Arresters: NONE

- ☒ Door Interlocks:
☒ Window and Screens:
☐ Fuse Holders: N/A
☒ Bus Insulation:
☒ Main Blade and Jaw
☒ Contacts

Alignment:
Travel / Overtoggle:
Break Jaw:
Blade / Pad:
Open Gap:

Phase "A"	Phase "B"	Phase "C"
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

Test Results:

Contact Resistance (Readings in Microhms):

Power Fuse Resistance:

Insulation Resistance (Readings in Megohms @):

	Phase "A"	Phase "B"	Phase "C"
①	120	91	115
	N/A	N/A	N/A
5000			
Sw Closed	A-G 20,000	B-G 20,000	G-G 20,000
Sw Closed	A-B 40,000	B-C 40,000	C-A 30,000
Sw Open	A-A 40,000	B-B 40,000	C-C 40,000

COMMENTS:

- ① REAMINGS HIGH DUE TO LOW TEMPERATURE OF CONTACT GREASE. READINGS SHOULD IMPROVE AS CONTACT TEMPERATURE RISES TO OPERATING CONDITIONS.
-
-

Tested By: L. K. McFARLAND

Form No: 3.0110.

SWITCH_PRIMARY



WESTINGHOUSE ELECTRIC CORPORATION

ELECTRICAL SYSTEMS SERVICES

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PRIMARY SWITCH TEST REPORT

Customer: US DEPARTMENT OF ENERGY
Location: RICHLAND, WA
(W) Job No: SEEG403

Date: JANUARY 14, 1997
Unique No: FEEDER 2 (TRANSFER SW)
Purchase Order:

Nameplate and Settings

Substation: MINI SUB
Feeder: TRANSFORMER DISCONNECT
Manufacturer: C-H/WESTINGHOUSE
Voltage Rating: 4.8 KV

Serial No.:
Style Number: GO No. HSW28522E Item 2A
Current: 600 A
Interrupting Rating: NONE

Fuses

Fuse Volt Rating: N/A Catalog No.: N/A Current Rating: N/A

Inspection and Adjustments

- | | |
|---|---|
| ☒ Finish Paint: | ☒ Door Interlocks: |
| ☐ Key Interlock: N/A | ☒ Window and Screens: |
| ☒ Operating Mechanism: | ☐ Fuse Holders: NONE |
| ☒ Barriers and Insulators: | ☒ Bus Insulation: |
| ☒ Arcing Blades and Chutes: | ☒ Main Blade and Jaw |
| ☐ Arresters: NONE | ☒ Contacts |

Alignment:
Travel / Overtoggle:
Break Jaw:
Blade / Pad:
Open Gap:

Phase "A"	Phase "B"	Phase "C"
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK
OK	OK	OK

Test Results:

Contact Resistance (Readings in Microhms):

Power Fuse Resistance:

Insulation Resistance (Readings in Megohms @):

Phase "A"	Phase "B"	Phase "C"
74	51	63
N/A	N/A	N/A

5000 Volts Ambient Temp. (Degrees C) : -5

Sw Closed
Sw Closed
Sw Open

A-G 20,000
A-B 50,000
A-A' 30,000

B-G 10,000
B-C 50,000
B-B' 30,000

G-G 20,000
C-A 50,000
C-C' 40,000

COMMENTS:

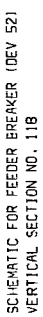
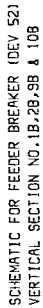
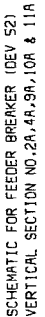
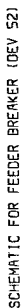
- CONTACT RESISTANCE SLIGHTLY HIGH DUE TO CONTACT GREASE TEMPERATURE. SHOULD IMPROVE AS CONTACTS REACH OPERATING TEMPERATURE.
-
-

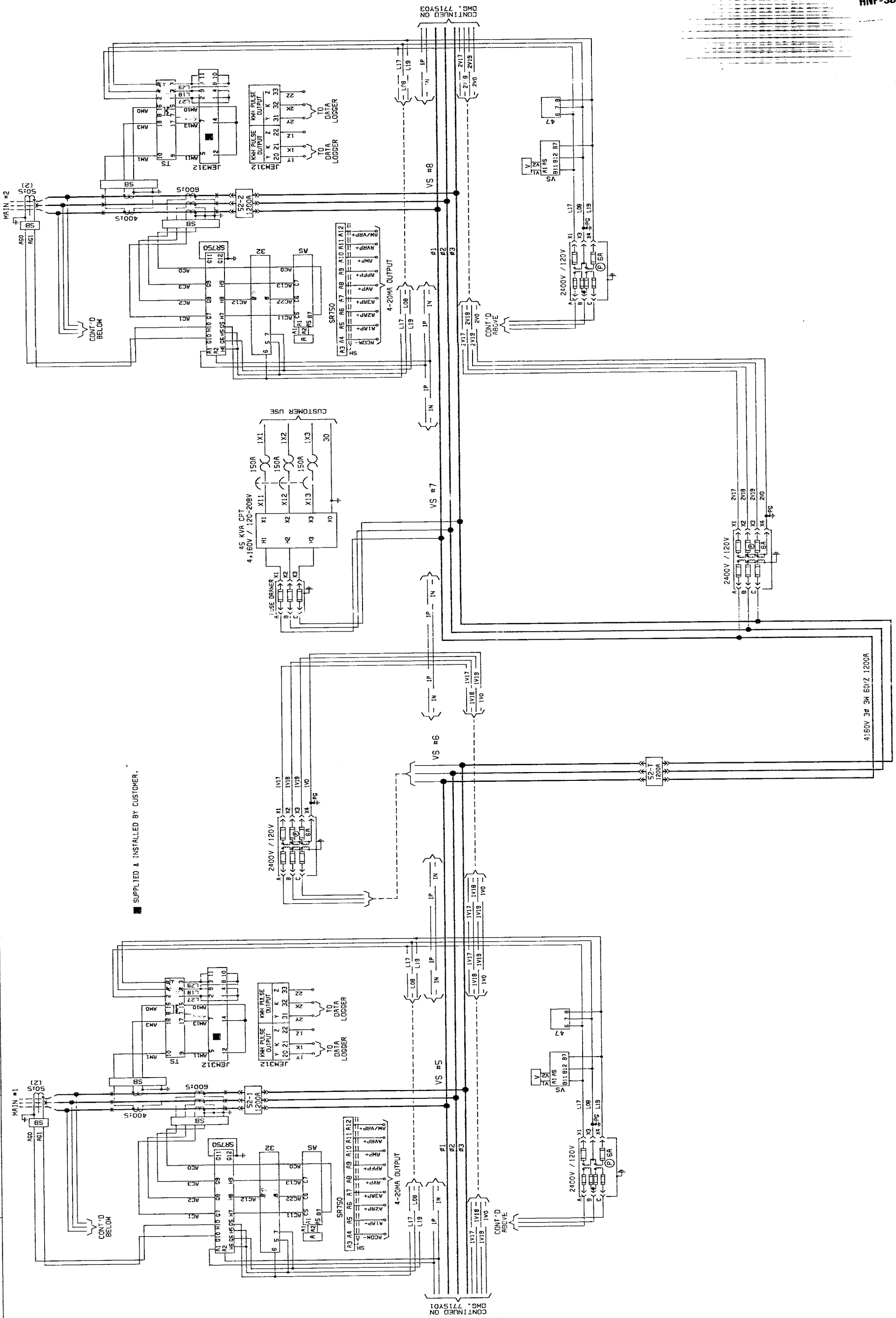
Tested By: L.R. McFARLAND

Form No: 3.0110.

SWITCH_PRIMARY

DRAWINGS





■ SUPPLIED & INSTALLED BY CUSTOMER.

16.0.717715 B.0.HSW2522E-MVA CHANGE		717715 MINOR CHANGES AFTER		CRAWFORD 05/13/96		HUTCHENS R. MATSKO		16.0.717715 B.0.HSW2522E-MVA CHANGE	
DATE 8/14/98		DATE 8/14/98		DATE 8/14/98		DATE 8/14/98		DATE 8/14/98	
DESIGN CRAWFORD		DESIGN CRAWFORD		DESIGN CRAWFORD		DESIGN CRAWFORD		DESIGN CRAWFORD	
DRAWN HUTCHENS		DRAWN HUTCHENS		DRAWN HUTCHENS		DRAWN HUTCHENS		DRAWN HUTCHENS	
CHECKED HUTCHENS		CHECKED HUTCHENS		CHECKED HUTCHENS		CHECKED HUTCHENS		CHECKED HUTCHENS	
APPROVED R. MATSKO		APPROVED R. MATSKO		APPROVED R. MATSKO		APPROVED R. MATSKO		APPROVED R. MATSKO	
TITLE PUREX (PLUTONIUM RECOVERY EXTRACTION)		TITLE PUREX (PLUTONIUM RECOVERY EXTRACTION)		TITLE PUREX (PLUTONIUM RECOVERY EXTRACTION)		TITLE PUREX (PLUTONIUM RECOVERY EXTRACTION)		TITLE PUREX (PLUTONIUM RECOVERY EXTRACTION)	
INDOOR VACUUM-AD-N SWITCH-GEAR		INDOOR VACUUM-AD-N SWITCH-GEAR		INDOOR VACUUM-AD-N SWITCH-GEAR		INDOOR VACUUM-AD-N SWITCH-GEAR		INDOOR VACUUM-AD-N SWITCH-GEAR	
50 VCP-N 350		50 VCP-N 350		50 VCP-N 350		50 VCP-N 350		50 VCP-N 350	
THREE LINE DIAGRAM		THREE LINE DIAGRAM		THREE LINE DIAGRAM		THREE LINE DIAGRAM		THREE LINE DIAGRAM	
SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1		SHEET 1 OF 1	
7715Y02		7715Y02		7715Y02		7715Y02		7715Y02	
6062		6062		6062		6062		6062	

NOTE TO CUSTOMER:
MAKE ALL POWER CONNECTIONS 1-2-3 FROM FRONT TO BACK, LEFT TO RIGHT, OR TOP TO BOTTOM, AS VIEWED FROM BREAKER DRANOUT SIDE, REGARDLESS OF THE PHASE ROTATION. SEE END FOR PHASE ROTATION.
LOCATION OF APPARATUS, WIRES OR CABLES MUST NOT BE DETERMINED FROM DIAGRAM.
DIAGRAMS-DEVICE FUNCTIONS AND NUMBERS ARE ANSI STANDARD.
CAUTION: CUSTOMER TO REMOVE JUMPERS WHEN CONNECTING TO REMOVE OR FUTURE EQUIPMENT.

■ DUMMY FUSE ■ SHORT DUTY TERM BLK
■ PULL FUSE ■ HEAVY DUTY TERM BLK

VERTICAL SECTION # 5
UPPER COMPARTMENT

HINGED PANEL (REAR VIEW)

LEFT SIDE SHEET

RIGHT SIDE SHEET

VERTICAL SECTION # 5

A COMPARTMENT (FRONT VIEW)

(CP)

CUSTOMER USE

1 SR750 4-20ma OUTPUT

2 TO DATA LOGGER

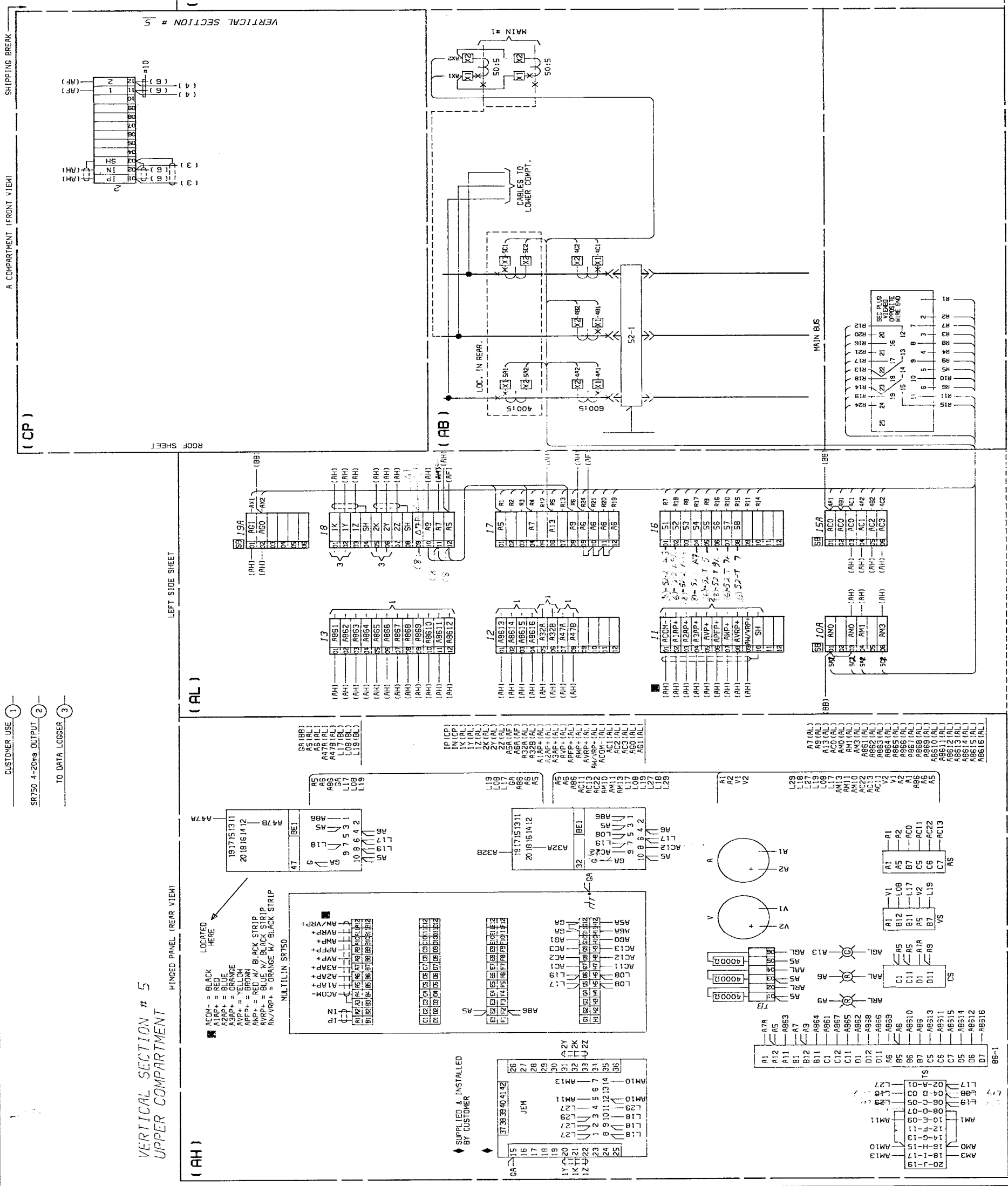
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(AH)

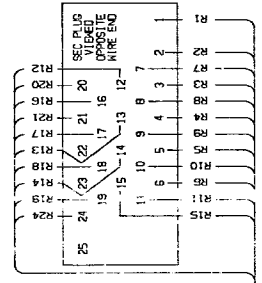
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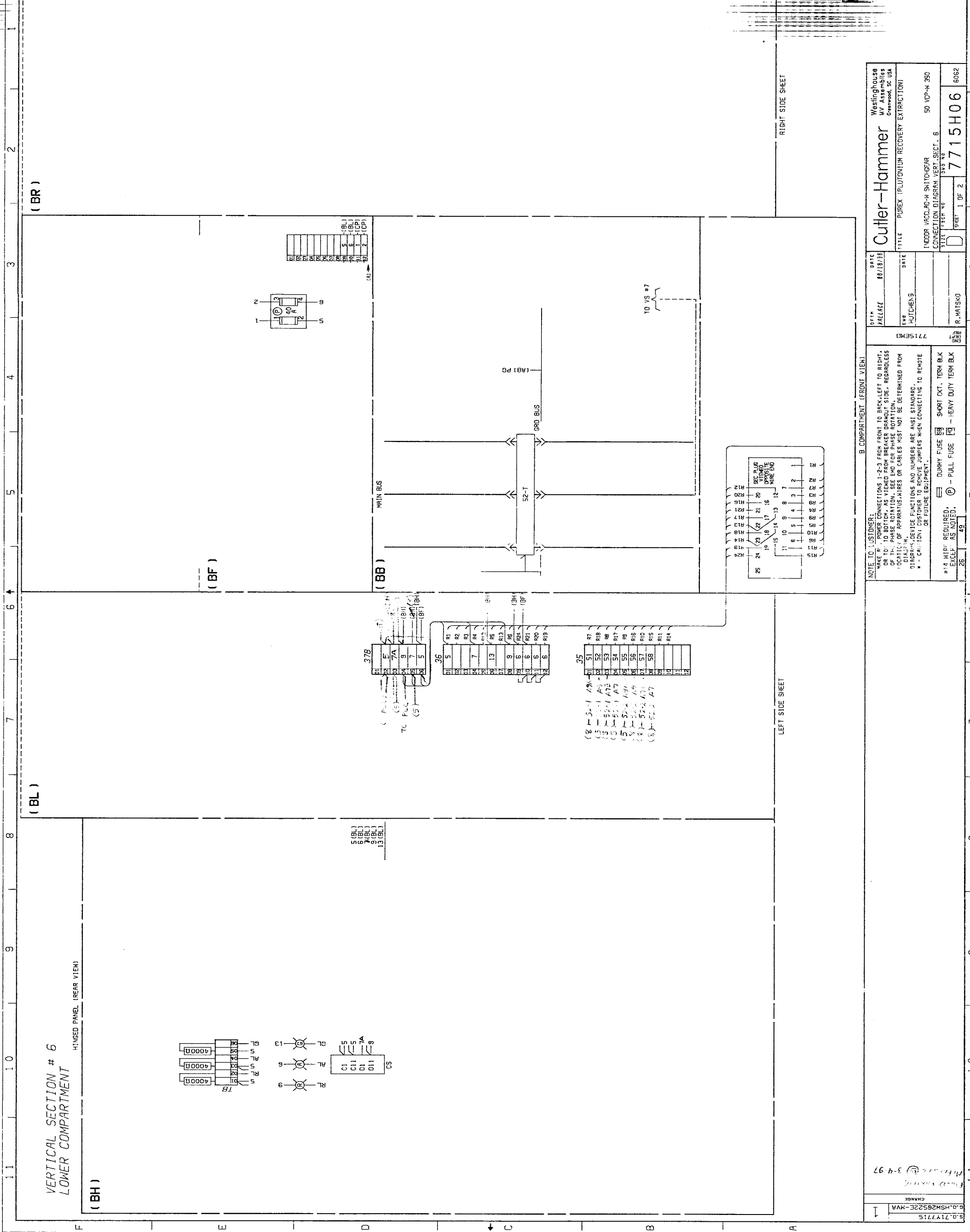
(AB)

(AR)



SUPPLIED & INSTALLED
BY CUSTOMER





Washinghouse MV Assemblies Greenwood, SC USA	
Cutler-Hammer	
TITLE: PUREX (PLUTONIUM RECOVERY EXTRACTION)	
DATE: 8/18/35	DATE: 8/18/35
BY: HUTCHENS	DATE: 8/18/35
INDOOR VACU-AD-W-SMTO-GEAR 50 VCP-W 350	
CONNECTION DIAGRAM VERT. SECT. 6	
TITLE: 7715H06	
SHEET 1 OF 2	
6062	

NOTE TO CUSTOMER:
MAKE #1 POWER CONNECTIONS 1-2-3 FROM FRONT TO BACK-LEFT TO RIGHT, OR 10" TO BOTTOM, AS VIEWED FROM BREAKER DRAWOUT SIDE, REGARDLESS OF THE PHASE ROTATION. SEE END FOR PHASE ROTATION.
TERMINALS OF APPROPRIATE WIRES OR CABLES MUST NOT BE DETERMINED FROM THIS DIAGRAM.
DIAGRAMS: DEVICE FUNCTIONS AND NUMBERS ARE ANSI STANDARD.
CAUTION: CUSTOMER TO REMOVE JUMPERS WHEN CONNECTING TO REMOTE OR FUTURE EQUIPMENT.

#14 WIRE REQUIRED, EXCEPT AS NOTED.

DUMMY FUSE 50 SHORT DUTY TERM BLK
PULL FUSE 10 - HEAVY DUTY TERM BLK



Westinghouse

FIELD ENGINEERING SERVICE REPORT

Job Order: SEEG708

Customer: H and N Electric/United States Department of Energy, PUREX Project.

Purpose of Visit: Westinghouse provided extended technical assistance at the PUREX Project to correct several items found deficient during initial commissioning and start up.

Date of Service: February 20, 21, 26, 27, 28, 1997

Persons Contacted: Mr. David Nelson, Babcock & Wilcox Project Engineer
Mr. Edgar Aponte, Cutler-Hammer Project Engineer
Mr. Robert Richard, Cutler-Hammer Sales Engineer

Apparatus ID: The following equipment underwent correction:

- 5 KV switchgear
- MCC main breakers, tie breaker, and ground fault wiring
- Mini-sub main breaker, neutral bus and ground fault wiring
- PLC interconnections

As Found: See Westinghouse report dated February 19, 1997 for as found conditions, and corrections made during initial commissioning and start up. The customer completed adding interposing relays to the interconnection between the PLC and 5 KV equipment.

Action Taken: Westinghouse performed the following corrective action or directed installing electricians concerning corrective action:

5 KV Switchgear

- Added control wiring to both main breakers and the tie breaker to prevent paralleling incoming feeds. The interlocking was provided instead of adding sync check relaying. The interlock wiring allows any two of the breakers to be closed at one time but prevents the third breaker from closing. The enclosed drawings were marked to show the changes made.
- Cell 10A received previously missing sheet metal trim which mates to the back of the breaker front cover when the breaker is in the connected position.
- Secured wiring harness to top of cells.

**FIELD ENGINEERING SERVICE REPORT**

Westinghouse

Job Order: SEEG708

480 V Motor Control Center

MCC Bldg. 1

- Ground fault protection scheme modified to provide proper residual protection for a two source, two ground substation (see attached schematic).
- Changed main breaker and tie breaker rating plugs to 1000 Amps. Breaker rating now less than 125% of transformer rating of 900 amps.
- Tested/certified ground fault protection scheme per attached scope SSW-26.
- Tested main breakers and tie breaker with Westinghouse Electronic Trip Unit Test Kit.

MCC Mini-sub

- Ground fault protection scheme modified to provide proper residual protection for a single source, single ground substation (see attached schematic).
- Changed main breaker rating plug to 1000 Amps. Breaker rating now less than 125% of transformer rating of 900 amps
- Tested/certified ground fault protection scheme per attached scope SSW-26.
- Tested main breaker with Westinghouse Electronic Trip Unit Test Kit.

PLC Interconnection

- Landed connections from interposing relays to 5 KV switchgear breaker control scheme. Installing electricians applied labels to wires not previously labeled.

Test Data:

Ground fault test/certification data appears on the attached test data sheets.

The test results for the 480 V motor control center main and tie breakers follow:

**FIELD ENGINEERING SERVICE REPORT****Westinghouse**

Job Order: SEEG708

Breaker	Rating	LT test	Long time	Short
	plug	setting	delay	delay test
MCC Main #1	1000 A	B	37 sec.	OK
MCC Main #2	1000 A	B	37 sec.	OK
MCC Tie	1000 A	B	37 sec.	OK
Mini-sub Main	1000 A	B	37 sec.	OK

Recommendations: The following items still require attention:

- Westinghouse recommends adding cell switches to the 5 KV switchgear mains and tie breakers to allow any one of the main or tie breakers to be removed without affecting interlock system performance. Current system requires all three breakers be connected to allow two of three breakers to close. Withdrawing one breaker would allow only one of the connected breakers to close and not allow energizing the entire switchgear. Adding cell switches would correct this situation.
- The MCC Bldg 1 mains and tie breakers require interlocking to prevent closing all three at the same time. The Cutler-Hammer supplied interlock brackets interfere with lock out provisions already installed on the breakers. The lock out provision also contains provisions for mounting key interlocks; therefore, only locks and mounting hardware (screws) are required.
- Voltmeters in 5 KV switchgear cells were not replaced since replacement meters were not available. Westinghouse understands Cutler-Hammer is supplying meters for the site electricians to install.

Remarks:

Westinghouse has completed the original and extended scope of work for commissioning and start-up at the PUREX Project.

Westinghouse will also provide a separate quote to supply the following:

- Cell switches for the 5 KV switchgear main and tie breaker interlock scheme.
- Labor to install cell switches and connect to interlock scheme.
- Key interlocks for the MCC Bldg.1 main and tie breakers.

Report by: Lyle McFarland, Field Service Engineer
Report Date: March 5, 1997
Phone: 206-656-4380

-3-

Westinghouse Electric Corporation
405 SW 41st Street
Renton, WA 98055

WESTINGHOUSE ELECTRIC
CORPORATION

ENERGY SERVICES
(206) 656-4380

STANDARD SCOPE OF WORK

SSW26 (4/95)

SSW 26.0 GROUND FAULT SYSTEMS (NEC 230-95)

26.1 Visual and Mechanical Inspection

Inspect for physical damage and compliance with plans and specifications.

Inspect neutral grounding connection to assure:

- a. Ground is properly positioned with respect to sensors.
- b. Source ground system neutral is grounded through sensing device.
- c. Ground connection is properly positioned with respect to neutral disconnect link.

Observe current sensor polarity marks conform to design drawings.

Zero sequence systems shall be inspected to verify proper routing of conductors.

Observe ground fault device is labeled to identify protected circuit.

Pick-up and time delay settings shall be set in accordance with engineer's provided settings.

26.2 Electrical Test

System neutral insulation resistance shall be measured to insure no shunt ground paths exist, neutral-ground disconnect link shall be removed, neutral insulation resistance measured and link replaced.

The relay pickup current shall be determined by primary injection at the sensor and the circuit interrupting device operated.

Conduct no trip test at less than pick-up amps.

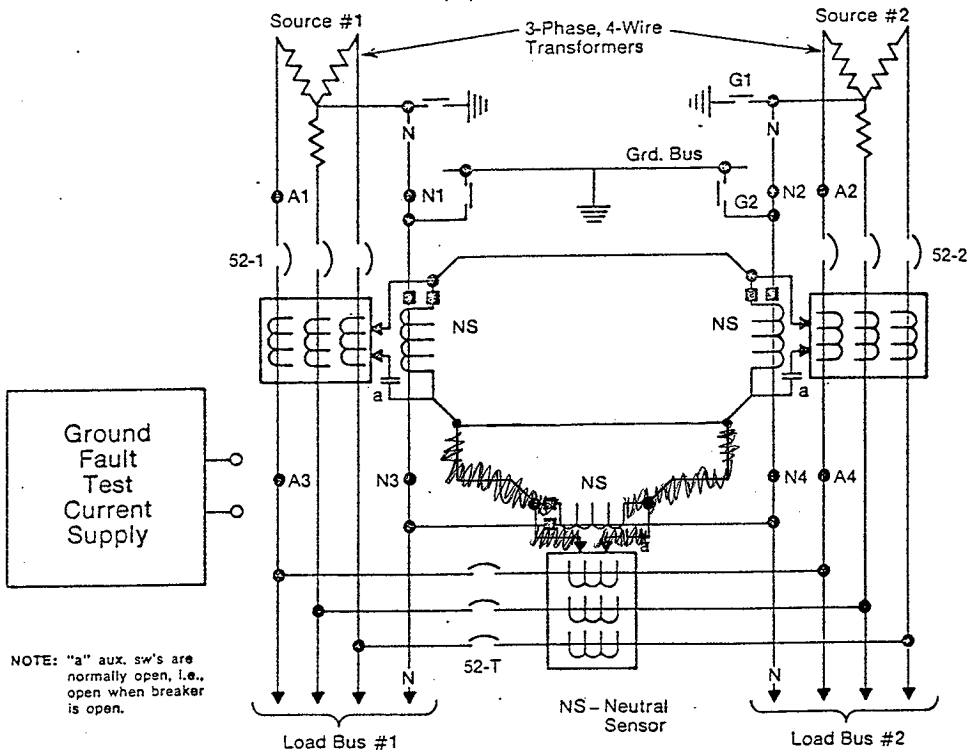
The relay timing shall be tested by injecting primary current into sensor. Total trip time shall be electrically monitored.

System operation shall be tested at 55% rated voltage. *N/A*

Zone interlock systems shall be tested by simultaneous sensor current injection and monitoring zone blocking function. *N/A*

NOTE: All checks done after installation.

FIGURE 12
Integral Ground Fault Protection on Main and Tie Breakers of
Double-Ended Equipment — 3-Phase, 4-Wire



Test No.	Connect Test Current Supply to Points	Connect Jumper between Points	During the Test Disconnect Ground from Neutral at Points	Breakers Open or Closed			Results Expected	Comments
				52-1	52-T	52-2		
12-1	A1 and N1	A4-N4	G1 and G2	c	c	o	Breakers 52-1 and 52-T should not trip.	Confirms that sensor polarity is correct.
12-2	A2 and N2	A4-N4	G1 and G2	o	c	c	Breaker 52-2 should not trip.	
12-3	A2 and N2	A4-N1	G1 and G2	o	c	c	Breaker 52-2 should trip.	52-2 trips for a G.F. on load bus = 2.
12-4	A1 and N1	A3-N2	G1 and G2	c	c	o	Breaker 52-1 should trip.	52-1 trips for a G.F. on load bus = 1.
12-5	A1 and N1	A4-N2	G1 and G2	c	c	o	Breaker 52-T should trip.	52-T trips for a G.F. on load bus = 2.

NOT
 APPLICABLE
 NO GF ON TIE

Westinghouse

Engineering Service

Seattle, Wa.

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TEST DATA SHEET



GROUND FAULT SYSTEM TEST DATA

Form SW26

CUSTOMER: <u>US DEPARTMENT OF ENERGY</u>	JOB NO.: <u>SEEG708</u>
LOCATION: <u>HANFORD, WA</u>	DATE: <u>2-21-97</u>
CIRCUIT DESIGNATION: <u>MCC MAIN#1</u>	ENGINEER: <u>L. McFARLAND</u>

A. VISUAL AND MECHANICAL INSPECTION

1. CONFORMS TO PLANS AND SPECIFICATIONS
 - a. ZERO SEQUENCE SENSOR SYSTEM ✓
N/A
 - b. RESIDUAL SENSOR SYSTEM ✓
N/A
 - c. SOURCE NEUTRAL MONITORING SYSTEM ✓
N/A
2. INSPECT NEUTRAL GROUNDING TO VERIFY:
 - a. PROPER LOCATION OF GROUND ✓
 - b. PROPER LOCATION OF NEUTRAL ISOLATION LINK ✓
 - c. CONDUCTORS AND SHIELDS ARE PROPERLY ROUTED ✓
 - d. BONDING IS PER N.E.C. ✓
3. INSPECT CURRENT SENSORS FOR:
 - a. PROPER POLARITY MARKS ✓
 - b. ROUTING OF CONDUCTORS FOR ZERO SEQUENCE SYSTEMS N/A
4. VERIFY GROUND FAULT RELAY
 - a. LABELING IDENTIFIES PROPER PROTECTIVE DEVICE OR CIRCUIT ✓
 - b. SETTINGS CONFORM TO CUSTOMERS DESIRED VALUES ✓

B. ELECTRICAL TEST RESULTS

1. NEUTRAL INSULATION (MEGOHMS) 2000+
2. GROUND FAULT RELAY:
 - a. PICKUP AMPS 1032
 - b. TRIPS PROPER DEVICE ✓
 - c. TIME DELAY AT 150 % PICKUP 0.48 sec.
 - d. CONFIRM NO TRIP AT 900 AMPS ✓
3. CONTROL VOLTAGE:
 - a. DESIGN VALUE (VOLTS) N/A
 - b. LOW VOLTAGE TEST (55%) N/A
4. ZONE INTERLOCKING VERIFICATION N/A
5. TEST PANEL OPERATION N/A

C. COMMENTS OF TEST ENGINEER

SYSTEM CORRECTLY CONFIGURED FOR 2 SOURCE / 2 GROUND
RESIDUAL GROUND FAULT SCHEME.

Westinghouse
Engineering Service
Seattle, Wa.
(206) 656-4380

TEST DATA SHEET



GROUND FAULT SYSTEM TEST DATA

Form SW26

CUSTOMER: <u>US DEPARTMENT OF ENERGY</u>	JOB NO.: <u>SEEG 708</u>
LOCATION: <u>HANFORD, WA</u>	DATE: <u>2-21-97</u>
CIRCUIT DESIGNATION: <u>MCC MAIN #2</u>	ENGINEER: <u>L. McFARLAND</u>

A. VISUAL AND MECHANICAL INSPECTION

1. CONFORMS TO PLANS AND SPECIFICATIONS
 - a. ZERO SEQUENCE SENSOR SYSTEM N/A
 - b. RESIDUAL SENSOR SYSTEM ✓
 - c. SOURCE NEUTRAL MONITORING SYSTEM N/A
2. INSPECT NEUTRAL GROUNDING TO VERIFY:
 - a. PROPER LOCATION OF GROUND ✓
 - b. PROPER LOCATION OF NEUTRAL ISOLATION LINK ✓
 - c. CONDUCTORS AND SHIELDS ARE PROPERLY ROUTED ✓
 - d. BONDING IS PER N.E.C. ✓
3. INSPECT CURRENT SENSORS FOR:
 - a. PROPER POLARITY MARKS ✓
 - b. ROUTING OF CONDUCTORS FOR ZERO SEQUENCE SYSTEMS N/A
4. VERIFY GROUND FAULT RELAY
 - a. LABELING IDENTIFIES PROPER PROTECTIVE DEVICE OR CIRCUIT ✓
 - b. SETTINGS CONFORM TO CUSTOMERS DESIRED VALUES ✓

B. ELECTRICAL TEST RESULTS

1. NEUTRAL INSULATION (MEGOHMS) 2000+
2. GROUND FAULT RELAY:
 - a. PICKUP AMPS 1090
 - b. TRIPS PROPER DEVICE ✓
 - c. TIME DELAY AT 150 % PICKUP 0.48 sec
 - d. CONFIRM NO TRIP AT 900 AMPS ✓
3. CONTROL VOLTAGE:
 - a. DESIGN VALUE (VOLTS) N/A
 - b. LOW VOLTAGE TEST (55%) N/A
4. ZONE INTERLOCKING VERIFICATION N/A
5. TEST PANEL OPERATION N/A

C. COMMENTS OF TEST ENGINEER

SYSTEM CORRECTLY CONFIGURED FOR 2 SOURCE / 2 GROUND
RESIDUAL GROUND FAULT SCHEME.

Westinghouse

Engineering Service

Seattle, Wa.

(206) 656-4380

TEST DATA SHEET



GROUND FAULT SYSTEM TEST DATA

Form SW26

CUSTOMER: <u>US DEPARTMENT OF ENERGY</u>	JOB NO.: <u>SEEG 708</u>
LOCATION: <u>HANFORD WA</u>	DATE: <u>2-26-97</u>
CIRCUIT DESIGNATION: <u>MINISUB MAIN</u>	ENGINEER: <u>L. McFARLAND</u>

A. VISUAL AND MECHANICAL INSPECTION

1. CONFORMS TO PLANS AND SPECIFICATIONS
 - a. ZERO SEQUENCE SENSOR SYSTEM ✓
N/A
 - b. RESIDUAL SENSOR SYSTEM ✓
N/A
 - c. SOURCE NEUTRAL MONITORING SYSTEM ✓
N/A
2. INSPECT NEUTRAL GROUNDING TO VERIFY:
 - a. PROPER LOCATION OF GROUND ✓
 - b. PROPER LOCATION OF NEUTRAL ISOLATION LINK ✓
 - c. CONDUCTORS AND SHIELDS ARE PROPERLY ROUTED ✓
 - d. BONDING IS PER N.E.C. ✓
3. INSPECT CURRENT SENSORS FOR:
 - a. PROPER POLARITY MARKS ✓
 - b. ROUTING OF CONDUCTORS FOR ZERO SEQUENCE SYSTEMS N/A
4. VERIFY GROUND FAULT RELAY
 - a. LABELING IDENTIFIES PROPER PROTECTIVE DEVICE OR CIRCUIT ✓
 - b. SETTINGS CONFORM TO CUSTOMERS DESIRED VALUES ✓

B. ELECTRICAL TEST RESULTS

1. NEUTRAL INSULATION (MEGOHMS) 4000MΩ
2. GROUND FAULT RELAY:
 - a. PICKUP AMPS 10.50
 - b. TRIPS PROPER DEVICE ✓
 - c. TIME DELAY AT 125 % PICKUP 0.48
 - d. CONFIRM NO TRIP AT 200 AMPS ✓
3. CONTROL VOLTAGE:
 - a. DESIGN VALUE (VOLTS) N/A
 - b. LOW VOLTAGE TEST (55%) N/A
4. ZONE INTERLOCKING VERIFICATION N/A
5. TEST PANEL OPERATION N/A

C. COMMENTS OF TEST ENGINEERGROUND FAULT SCHEME OPERATES PROPERLY.

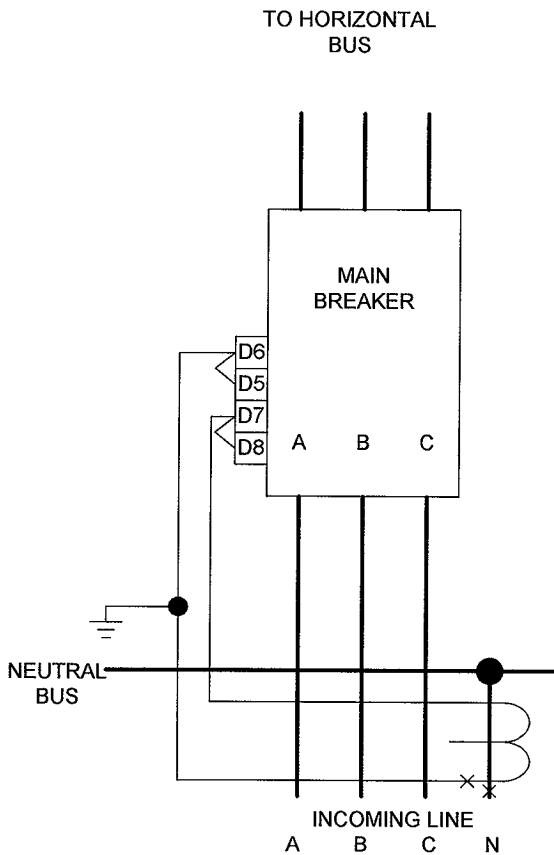


FIGURE 1
GROUND FAULT SCHEME
MINI-SUB

TO HORIZONTAL
 BUS

TO HORIZONTAL
 BUS

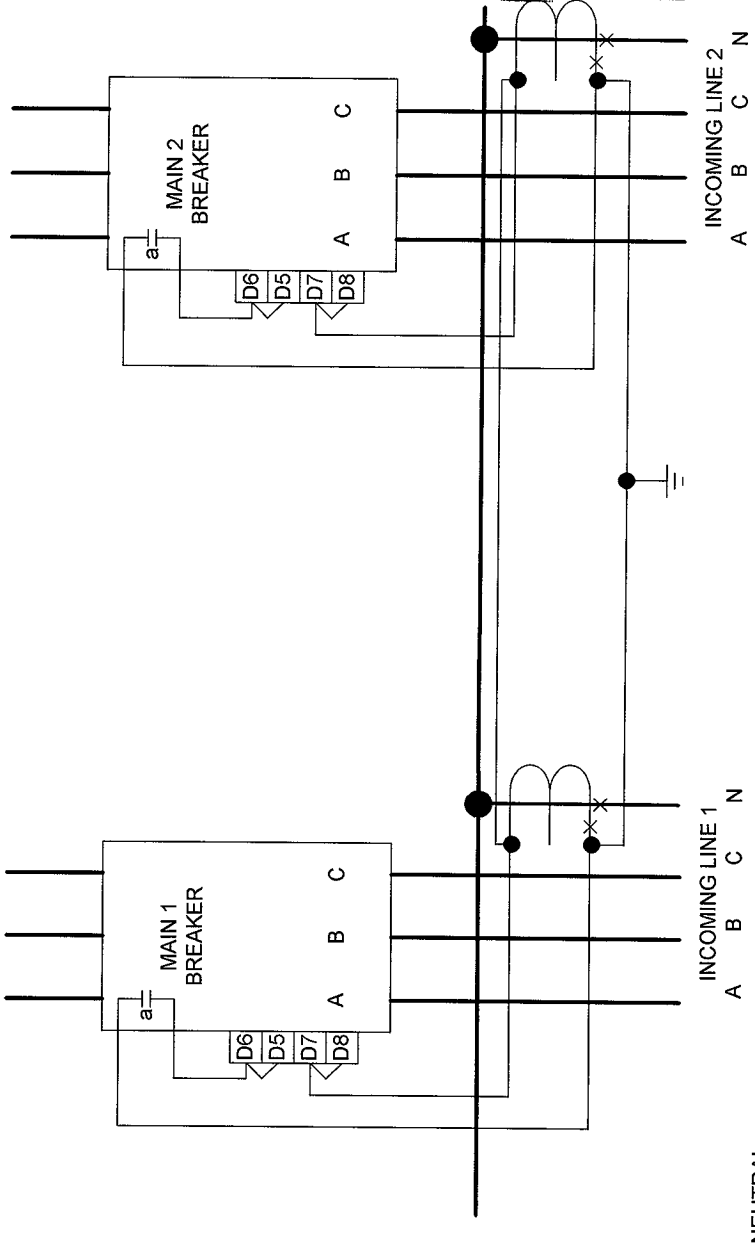


FIGURE 2
 GROUND FAULT SCHEME MCC
 BLDG 1

SECTION 7

**SUBSTATION, MINI-SUBSTATION, ELECTRICAL SYSTEM & LOADS
NEC (NATIONAL ELECTRICAL CODE) INSPECTION**

ALL NEW CONSTRUCTION WILL MEET THE CURRENT NEC AND BE
INSPECTED & BE FOUND ACCEPTABLE BY THE HANFORD SITE NEC
INSPECTORS PRIOR TO ENERGIZATION.

NEC INSPECTION REPORT

Project/W.O. No. E30271		Building No. 291AE		Code Edition NEC, 1996 Edition		Report No. 5317	
Inspection Requested By Allen Hjellum		Phone 372-0536		Inspector Wallace DO		Phone 372-2290	
Page 1 of 2							
Item Inspected: Inspection of Service Panelboard B for building 291AE, 225 amp main breaker installed as per drawing H-821854 sheet 3.							
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)							
Inspector Signature: DO Wallace <i>DO. Wallace</i>				Original Inspection Date Oct. 21, 1996		Closure Date Nov. 22, 1996	
	Description of NEC Violation				Cause Code	Days to Correct	Violation Corrected
1	Where the equipment grounding conductor is run with circuit conductors to a separate building for grounding any noncurrent-carrying metal equipment, interior metal piping and building steel, it is also required to bond to the existing grounding electrode, Article 250-24 Except #2.				D		DOw 11-22-96
2	Complete panelboard schedule as required in Article 384-13 & 110-22.				C		DOw 11-22-96
3	Complete panelboard schedule as required in Article 384-13& 110-22.				C		DOw 11-22-96
4	Terminals for more than one conductor shall be identified, Article 110-14(a). Circuit breaker #7 has two conductors installed under one lug.				D		DOw 11-22-96
5	Where a disconnecting means is not within sight from the heater, a separate disconnecting means shall be installed, or the disconnecting means shall be capable of being locked in the open position, Article 424-19.				D		DOw 11-22-96
6	Bond equipment grounding conductor to metal box as required in Article 250-114 (a). All junction boxes.				C		DOw 11-22-96
7	Seal conduit as required in Article 300-5(g) and 230-8.				C		DOw 11-22-96

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Page 2 of 2

Project/W.O. No. E30271		Building No. 291AE		Code Edition NEC, 1996 Edition		Report No. 5317	
	Description of NEC Violation			Cause Code	Days to Correct	Violation Corrected	Date
1	Bond 4" conduit to cable tray installed east of building 291AE as required in Article 250-75.					000	11-22-96
2							
3							
4							
5							
6							
7							
8							
9							
10							

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5347		
Inspection Requested By Thea Wallace	Phone 373-2939	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of 750/1000 KVA, 2400 primary 480Y/277 volt secondary Transformers T1 & T2 installed west of Unit Substation as per drawing H-2-821864 sheet 1.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>DO Wallace</i>		Original Inspection Date Nov. 13, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1					
2					
3					
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. Purex	Code Edition NEC, 1996 Edition	Report No. 5290		
Inspection Requested By Thea Wallace	Phone 373-2939	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of 4/0 ground wire and ground rods installed around two 13.8/2.4 KV, 1500 KVA transformer pad/vaults prior to backfill as per drawing H-2-821857 sheet 5.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>D.O. Wallace</i>		Original Inspection Date Sep. 20, 1996		Closure Date Sep. 20, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1					
2					
3					
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5324		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #1, 45 KVA transformer and 60 amp disconnect installed in the Storage Gallery, Column 11 as per drawing H-2-821860 sheet 2.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace		Original Inspection Date Oct. 22, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D		DOW	11/13/96
2	16 X 20 Hoffman box has two conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11-13-96
3					
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271		Building No. 202A		Code Edition NEC, 1996 Edition		Report No. 5320	
Inspection Requested By Allen Hjellum		Phone 372-0536		Inspector Wallace DO		Phone 372-2290	
						Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #2, 45 KVA transformer and 60 amp disconnect installed in the Storage Gallery, Column 14 as per drawing H-2-821860 sheet 1.							
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)							
Inspector Signature: DO Wallace <i>D.O. Wallace</i>				Original Inspection Date Oct. 22, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation			Cause Code	Days to Correct	Violation Corrected	Date
1	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).			C		DOW	11/13/96
2	Install 1 1/2" KO seal in unused opening in panelboard, Article 110-12(a).			C		DOW	11-13-96
3	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).			D		DOW	11-13-96
4	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).			C		DOW	11-13-96
5							
6							
7							

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5321		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290		
		Page 1 of 2			
Item Inspected: Inspection of lighting Panelboard #3, 45 KVA transformer and 60 amp disconnect installed in the Storage Gallery, Column 21 as per drawing H-2-821860 sheet 1.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>DO. Wallace</i>		Original Inspection Date Oct. 22, 1996	Closure Date Nov. 13, 1996		
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	Bond equipment grounding conductor to all junction boxes as required in Article 250-114(a).	C		DOW	11/13/96
2	Support T conduit with fixtures attached, as required in Article 370-23 & 410-16(a).	C		DOW	11-13-96
3	Install 3/4" KO seal in unused opening in 60 amp disconnect, Article 110-12(a).	C		DOW	11-13-96
4	Install fuse in 60 amp disconnect, C phase, Article 240-3.	C		DOW	11-13-96
5	Fixture installed at column 24 is missing glass cover, Article 110-3(b).	C		DOW	11-13-96
6	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D		DOW	11-13-96
7	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11-13-96

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271		Building No. 202A		Code Edition NEC, 1996 Edition		Report No. 5322	
Inspection Requested By Allen Hjellum		Phone 372-0536		Inspector Wallace DO		Phone 372-2290	
Page 1 of 1							
Item Inspected: Inspection of lighting Panelboard #4, 45 KVA transformer and 60 amp disconnect installed in the Storage Gallery, Column 28 as per drawing H-2-821860 sheet 1.							
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)							
Inspector Signature: DO Wallace				Original Inspection Date Oct. 22, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation			Cause Code	Days to Correct	Violation Corrected	Date
1	Support T conduit with fixtures attached, as required in Article 410-16(a) & 370-23.			C		DOW	11/13/96
2	Bond equipment grounding conductor to all junction boxes as required in Article 250-114(a).			C		DOW	11-13-96
3	Install fuses in 60 amp disconnect, Article 240-3.			C		DOW	11-13-96
4	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).			D		DOW	11-13-96
5	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).			C		DOW	11-13-96
6							
7							

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5323		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290		
		Page 1 of 1			
Item Inspected: Inspection of lighting Panelboard #5, 45 KVA transformer and 60 amp disconnect installed in the Storage Gallery, Column 37 as per drawing H-2-821860 sheet 1.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>D.O. Wallace</i>		Original Inspection Date Oct. 22, 1996	Closure Date Nov. 13, 1996		
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).	C		DOW	11/13/96
2	Install fuses in 60 amp disconnect, Article 240-3.	C		DOW	11-13-96
3	Install LB cover, Article 370-28(c).	C		DOW	11-13-96
4	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D		DOW	11-13-96
5	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11-13-96
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5325
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290
		Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #6, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery, Column 10 as per drawing H-2-821860 sheet 3.			
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)			
Inspector Signature: DO Wallace <i>DO Wallace</i>		Original Inspection Date Oct. 23, 1996	Closure Date Nov. 13, 1996
	Description of NEC Violation	Cause Code	Days to Correct
1	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).	C	DOW
2	Support T condulets with fixtures attached, as required ind Article 370-23 & 410-16(a).	C	DOW
3	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D	DOW
4	16 X 20 Hoffman box has two conductors installed under one lug, this is a violation of Article 110-14(a).	C	DOW
5			
6			
7			

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5326		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #7, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery, Column 17 as per drawing H-2-821860 sheet 3.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace		Original Inspection Date Oct. 23, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).	C		DOW	11/13/96
2	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D		DOW	11-13-96
3	16 X 20 Hoffman box has two conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11-13-96
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5327
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290
		Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #8, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery, Column 31 as per drawing H-2-821860 sheet 3.			
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)			
Inspector Signature: DO Wallace		Original Inspection Date Oct. 23, 1996	Closure Date Nov. 13, 1996
	Description of NEC Violation	Cause Code	Days to Correct
1	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).	C	DOW
2	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D	0000
3	16 X 20 Hoffman box has two conductors installed under one lug, this is a violation of Article 110-14(a).	C	0000
4			
5			
6			
7			

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5328		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #9, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery, Column 38 as per drawing H-2-821860 sheet 3.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>DO. Wallace</i>		Original Inspection Date Oct. 23, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	16 X 20 Hoffman box has two conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11/13/96
2	Support T condulets with fixtures attached, as required in Article 370-23 & 410-16(a).	C		DOW	11-13-96
3	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).	D		DOW	11-13-96
4	16 X 20 Hoffman box has tow conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11-13-96
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271		Building No. 202A		Code Edition NEC, 1996 Edition		Report No. 5319	
Inspection Requested By Allen Hjellum		Phone 372-0536		Inspector Wallace DO		Phone 372-2290	
						Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #10, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery West Switchgear room as per drawing H-2-821860 sheet 4.							
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)							
Inspector Signature: DO Wallace				Original Inspection Date Oct. 22, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation			Cause Code	Days to Correct	Violation Corrected	Date
1	install cover on LB conduit, Article 370-28(c).			D		DOW	11/13/96
2	The grounding electrode conductor installed at XO of the 45 KVA transformer is required to connect to the nearest available structural steel, Article 250-26(c). The grounding electrode shall be as near as practicable.					OW	11-13-96
3	60 amp disconnect does not have the required working clearance as described in Article 110-16(a). The work space shall not be less than 30 in. in front of the electric equipment.					OW	11-13-96
4	The equipment grounding conductor installed in the 60 amp disconnect is required to bond to building steel, Article 250-24(a).					OW	11-13-96
5	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).			C		OW	11-13-96
6							
7							

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5318		
Inspection Requested By Allen Hjellum	Phone 372-0536	Inspector Wallace DO	Phone 372-2290	Page 1 of 1	
Item Inspected: Inspection of lighting Panelboard #11, 45 KVA transformer and 60 amp disconnect installed in the P & O Gallery Aqueous Make-up as per drawing H-2-821860 sheet 4.					
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)					
Inspector Signature: DO Wallace <i>D.O. Wallace</i>		Original Inspection Date Oct. 22, 1996		Closure Date Nov. 13, 1996	
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	Panelboard and 60 amp disconnect do not have the required working clearance as described in Article 110-16(a). The work space shall not be less than 30 in. wide in front of the electric equipment.	D		DOW	11/13/96
2	16 X 20 Hoffman box has two equipment grounding conductors installed under one lug, this is a violation of Article 110-14(a).	C		DOW	11/13/96
3	The equipment grounding conductor installed in the 60 amp disconnect is required to be bonded to building steel, Article 250-24(a).	D		DOW	11/13/96
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271		Building No. 202A		Code Edition NEC, 1996 Edition		Report No. 5414	
Inspection Requested By Thea Wallace		Phone 373-2939		Inspector Wallace DO		Phone 372-2290	
						Page 1 of 1	
Item Inspected: Inspection of Mini Substation and 2400/480Y277 volt Transformer T3 located on the north side of Purex as per drawing H-2-821865 sheets 1 & 2.							
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)							
Inspector Signature: DO Wallace <i>D.O. Wallace</i>				Original Inspection Date Feb. 27, 1997		Closure Date Feb. 28, 1997	
	Description of NEC Violation			Cause Code	Days to Correct	Violation Corrected	Date
1	750/1000 KVA Transformer T3 is required to have a grounding electrode conductor connecting the grounded conductor of the derived system to the grounding electrode, Article 250-26(b) & 250-91(a).			D		DOW	2/28/97
2	Receptacles installed within 6 feet of exterior doors are required to have ground fault protection, DOE 6430.1A paragraph 1605-2.3.			D		<i>DOW</i>	2-28-97
3	Bond equipment grounding conductor to all metal junction boxes as per Article 250-114(a).			C		DOW	2/28/97
4	750/1000 KVA Transformer T3 is required to have a grounding electrode conductor connecting the grounded conductor of the derived system to the grounding electrode, Article 250-26(b) & 250-91(a).			D		<i>DOW</i>	2-28-97
5	2400 volt primary disconnect is required to have a grounding electrode conductor connecting the grounded conductor to the grounding electrode, Article 250-24(a).			D		<i>DOW</i>	2-28-97
6							
7							

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5351
Inspection Requested By Thea Wallace	Phone 373-2939	Inspector Wallace DO	Phone 372-2290
		Page 1 of 2	
Item Inspected: Inspection of Unit Substation built offsite, located east of 2400/480Y277 volt Transformers T1 & T2, reference drawing H-2-821864 sheet 1.			
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)			
Inspector Signature: DO Wallace <i>DO. Wallace</i>		Original Inspection Date Nov. 15, 1996	Closure Date Feb. 27, 1997
	Description of NEC Violation	Cause Code	Days to Correct
1	MCC 1 & 2 ground-fault protection system requires performance testing and written record made available to the authority having jurisdiction, as per Article 230-95.	U	DOW
2	The branch circuit feeding the emergency lights & exit signs shall be the same branch circuit as that serving the normal lighting in the area, Article 700-12(e). Emergency lights/exits signs are installed on circuit #4 in Lighting Panelboard, normal lighting is circuit 1.	D	DOW
3	SO cord with male plugs installed connected to 4 square box does not meet the requirements of Article 400-7 & 400-8.	C	DOW
4	Interior metal piping is required to be bonded to grounding electrode, Article 250-80(b).	C	DOW
5	Ground 37.5 KVA single phase transformer as required in Article 250-26. A grounding electrode conductor shall connect the grounded conductor of the derived system to the grounding electrode.	C	DOW
6	Bond equipment grounding conductor to all metal junction boxes as per Article 250-114(a).	C	DOW
7	Receptacles installed within 6 feet of exterior doors are required to have ground fault protection, DOE 6430.1A paragraph 1605-2.3.	D	DOW

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

Author: Debra O Wallace at ~WHC40
Date: 3/6/97 11:10 AM
Priority: Normal
Subject: Re: NEC INSPECTION REPORT #5351

----- Message Contents -----

Dave,

That report should read 1 of 1, no second page.

Deb

Reply Separator

Subject: NEC INSPECTION REPORT #5351
Author: David E Nelson at ~WHC139
Date: 3/5/97 9:38 AM

DEBRA

PLEASE SEND ME A COPY OF SHEET 2 OF REPORT #5351. I GOT SHEET/PAGE 1
WITH YOUR SIGNATURES AS BEING ACCEPTABLE, BUT PAGE 2 WAS NOT ATTACHED.

THANKS

DAVE

NEC INSPECTION REPORT

Project/W.O. No. E30271	Building No. 202A	Code Edition NEC, 1996 Edition	Report No. 5413
Inspection Requested By Thea Wallace	Phone 373-2939	Inspector Wallace DO	Phone 372-2290
		Page 1 of 1	
Item Inspected: Inspection of HVAC units installed on Unit Substation rooftop as per drawing H-2-821864 sheet 1.			
Condition Found: ☒ Acceptable ☐ Unacceptable (see description below)			
Inspector Signature: DO Wallace <i>DO Wallace</i>		Original Inspection Date Feb. 27, 1997	Closure Date Feb. 28, 1997
	Description of NEC Violation	Cause Code	Days to Correct
1	A 125-volt single phase receptacle is required to be installed at an accessible location for servicing of equipment on rooftops, Article 210-63. The receptacle shall be located on the same level and within 25 feet of the heating, air conditioning equipment.	D	DOW
2			
3			
4			
5			
6			
7			

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Project/W.O. No. KP4BA	Building No. Purex	Code Edition NEC, 1996 Edition	Report No. 8053
Inspection Requested By David E. Nelson	Phone 373-1147	Inspector Bresina WL	Phone 372-2459
			Page 1 of 2

Item Inspected:

Skid built to monitor Purex building systems.

Condition Found:

☐

Acceptable

☒

Unacceptable (see description below)

Inspector Signature:

WL Bresina

W.L. Bresina

Original Inspection Date

Jan. 23, 1997

Closure Date

2/27/97

	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	Size #6 equipment grounding conductors must be identified by a continuous green outer finish or be bare. Replace black conductors in panelboards, transformers, and UPS system. Article 310-12(b)		30	<i>WLB</i>	2/27/97
2	Panelboard directory doesn't identify room lighting circuit. Plus 100 amp panelboard on right side has #4 circuit marked spare but has conductor on breaker. Article 384-13		30	<i>WLB</i>	2/27/97
3	Outside panelboard and panelboard next to UPS system batteries don't have directory identifying circuits. Article 384-13		30	<i>WLB</i>	2/27/97
4	Outside 480 volt panelboard has equipment grounding conductors on neutral bar that is floating above ground. Install equipment ground terminal bar for conductors per manufacturers instructions.		30	<i>WLB</i>	2/27/97
5	Install two ground rod electrodes and take a size #6 grounding electrode conductor to the outside 480 volt panelboard equipment grounding bar. Articles 250-24, 250-83, and 250-84.		30	<i>WLB</i>	2/27/97
6	Insulated bushings needed on raceways with size #4 or larger conductors entering panelboards and 480/208 volt transformer. Article 300-4(f)		30	<i>WLB</i>	2/27/97
7	SIZE #6 GROUNDING CONDUCTORS MUST BE IDENTIFIED BY A CONTINUOUS WHITE OUTER FINISH ALONG ITS ENTIRE LENGTH. REPLACE BLACK WIRES IN PANELBOARDS, TRANSFORMERS, AND UPS SYSTEM - ARTICLE 200-6(A) & 310-12(A)		30	<i>WLB</i>	2/27/97

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

NEC INSPECTION REPORT

Page 2 of 2

Project/W.O. No.	Building No.	Code Edition	Report No.			
KP4BA	Purex	NEC, 1996 Edition	8053			
	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date	
1	A grounding electrode conductor must be installed at panelboard neutral bar. (Fed from 37 1/2 KVA transformer, next to UPS batteries.) Article 250-26		30	<i>WLB</i>	2/27/97	
2	Install a main bonding jumper from neutral bar to equipment grounding bar sized from table 250-94 in panelboard fed from 37 1/2 KVA transformer.		30	<i>WLB</i>	2/27/97	
3	A color code of the two system voltages must be installed using phase tape on conductors. Plus the panelboards must have each color code used in panel posted at cover. Article 210-4(d)		30	<i>WLB</i>	2/27/97	
4	Remove size #12 bonding jumper in panelboard A3 installed from neutral bar to equipment grounding bar and install a grounding electrode conductor at XO terminal of transformer feeding panel A3, sized from table 250-94 and take conductor to ground rods. Articles 250-26, 250-83, and 250-84		30	<i>WLB</i>	2/27/97	
5						
6	Three electric cylinder control devices must have guards installed over 120 volt terminal strips. Article 110-17		30	<i>WLB</i>	2/27/97	
7	Control cables in cable tray are not ITC rated cable (Article 727). Install a raceway such as a liquid tight flexible nonmetallic conduit between EMT raceway to equipment following Article 351-27. Article 340-3		30	<i>WLB</i>	2/27/97	
8	Size #6 conductor feeding 100 amp panelboard from UPS cabinet on 200 amp breaker must have a 60 amp breaker replace the 200 amp breaker.		30	<i>WLB</i>	2/27/97	
9	Emergency light must be on same circuit as room lighting, plus the panelboard directory must be marked that circuit supplies emergency lighting. Article 700-12(e)		30	<i>WLB</i>	2/27/97	
10	Three equipment grounding conductors on terminal listed for one, located in UPS cabinet. Article 110-14		30	<i>WLB</i>	2/27/97	

NEC INSPECTION REPORT

Project/W.O. No. KP4BA	Building No. Purex	Code Edition NEC, 1996 Edition	Report No. 8054
Inspection Requested By David E. Nelson	Phone 373-1147	Inspector Bresina WL	Phone 372-2459
			Page 1 of 1

Item Inspected:

Continuation of Report No. 8053 - Skid built to monitor Purex building systems.

Condition Found: ☐ Acceptable ☒ Unacceptable (see description below)

Inspector Signature:

WL Bresina

W.L. Bresina

Original Inspection Date

Jan. 23, 1997

Closure Date

2/27/97

	Description of NEC Violation	Cause Code	Days to Correct	Violation Corrected	Date
1	3/4" Rigid conduit entering 480 volt panelboard outside must have bushing. Article 346-8		30	<i>WLB</i>	<i>2/27/97</i>
2	3/4" Rigid conduit entering air conditioning unit must have a ground bushing and a #10 jumper installed. Article 250-76		30	<i>WLB</i>	<i>2/27/97</i>
3					
4					
5					
6					
7					

Electrical service will be discontinued for the equipment or facility identified if violations are not corrected within time allowed by the "Days to Correct" column. "Days to Correct" starts with the original inspection date. For concerns regarding this, call the Chief Electrical Engineer at 376-6347.

SECTION 8

ELECTRICAL UTILITIES PADMOUNT TRANSFORMER & CABLE TESTS

- A. TRANSFORMER INSULATING OIL DIELECTRIC TEST RESULTS
- B. TRANSFORMER HOT-COLLAR TEST RESULTS
- C. TRANSFORMER EXCITATION TEST RESULTS
- D. CABLE HYPOT TEST RESULTS

TWO WINDING TRANSFORMER INSULATION TEST 200E PUREX C6705E

Identification Panel

COMPANY: Westinghouse Hanford Company

DIVISION: UTILITIES

LOCATION: 200E PUREX

SPECIAL ID: C6705E

CCT DESIG: WO #: 6B9500568

RETEST DATE:

Transformer Nameplate Data TEST CONDITIONS

MFR: CPS SERIAL #: 966001811

PH: 3

DATE: Dec 06 1996

YEAR MFR: 1996 TYPE:

CFG: D-D

WEATHER: NIGHT RH: 75%

KV: 13.8/2.4 kVA: 1500/ / //

V: 485 UG

AIR TEMP: 0°C

TANKTYPE: N2 BLANKETED COOLNT: OIL

TOP OIL TEMP: 19°C

Bushing Nameplate C1 C2

BUSH SERIAL # MFR TYPE %PF C(pF) %PF C(pF) KV AMPS YEAR

H1
H2
H3
H0
X1
X2
X3
X0

COPIES TO: lamm/doble LAST TEST DATE:

LAST SHT #:

TEST SET TYPE: M4K INS #: 491 XFMR #: 516

REASON FOR TEST: ACCEPTANCE

TESTED BY: wcmarrh APPRV BY: APPRV DATE:

SHT #: 2-c-6705-1996

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

TWO WINDING TRANSFORMER INSULATION TEST 200E PUREX C6705E

Overall Tests

LINE NI	TEST CONNECTIONS				TEST kV	Equiv. 10kV		% PWR FCTR		corr fctr	WND meas C (pF)	MEASURED	INS RTG
	ENG	GND	GAR	UST		mA	Watts	meas	corr				
1	HIGH	LOW	LOW	LOW	10	35.080	1.145	0.43	0.44	1.03	9306	CH + CHL	G
2	HIGH				10	8.866	0.382			1.03	2351	CH	
3	HIGH				10	26.210	0.783			1.03	6954	CHL(UST)	
4	TEST 1 MINUS TEST 2					26.214	0.763	0.29	0.30	1.03	6955	CHL	G
5	LOW	HIGH	HIGH	HIGH	2.5	46.650	1.721	0.45	0.46	1.03	12374	CL + CHL	G
6	LOW				2.5	20.430	0.910			1.03	5419	CL	
7	LOW				2.5	26.210	0.812			1.03	6953	CHL(UST)	
8	TEST 5 MINUS TEST 6					26.220	0.811	0.31	0.32	1.03	6955	CHL	G
9	CH MINUS BUSHING C1									1.03		CH'	
10	CL MINUS BUSHING C1									1.03		CL'	

<**** IWC DETAIL ****>

LINE	<mA>		mult	<Watts>		mult	<pF>		mult
	meter			meter			meter		
1	35.08/35.08	1	/1	1.145/1.145	1	/1	9306./9306.	1	/1
2	8.866/8.866	1	/1	0.382/0.382	1	/1	2351./2351.	1	/1
3	26.21/26.21	1	/1	0.783/0.783	1	/1	6954./6954.	1	/1
5	46.65/46.65	1	/1	1.721/1.721	1	/1	12374/12374	1	/1
6	20.43/20.43	1	/1	0.910/0.910	1	/1	5419./5419.	1	/1
7	26.21/26.21	1	/1	0.812/0.812	1	/1	6953./6953.	1	/1

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

TWO WINDING TRANSFORMER INSULATION TEST 200E PUREX C6705E

Hot-collar Tests

TEST # NI	BUSH #	SERIAL #	CNTR COND	COLLAR UNDER SKT #	TEST kV	Equiv. 10kV			INS RTG
						mA	Watts		
1	X1		GROUND	2	10	0.085	0.039		G
2	X2		GROUND	2	10	0.088	0.068		G
3	X3		GROUND	2	10	0.087	0.063		G

<**** IWC DETAIL ****>

LINE	<mA>		<Watts>		<pF>	
	meter	mult	meter	mult	meter	mult
1	0.085/0.085	1	0.039/0.039	1	/	/
2	0.088/0.088	1	0.068/0.068	1	/	/
3	0.087/0.087	1	0.063/0.063	1	/	/

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

TWO WINDING TRANSFORMER INSULATION TEST 200E PUREX C6705E

Oil Sample Test Tests

TEST # NI	SAMPLE LOCATION	TMP °C	TEST kV	Equiv. 10 kV		% PWR FCTR		corr fctr		INS RTG
				mA	Watts	meas	corr			
1	SAMPLE VALVE	6	10	0.897	0.001	0.01	0.01	1.47		G

<**** IWC DETAIL ****>

LINE	meter	<mA>	mult	meter	<Watts>	mult	meter	<pF>	mult
1	0.897/0.897	1	/1	0.001/0.001	1	/1	/		/

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

TRANSFORMER WORK SHEET

REV 10 - 02/14/94

TRANSFORMER # C6205E

WORKPACKAGE # <u>6A95-00568</u>	LOCATION	AREA <u>400E</u>	STATION
MANUFACTURER: <u>COOPER</u>	POLARITY	VOLTAGE:	
FACILITY LOCATED IN:	Additive	PRIMARY/HIGH <u>13.8</u>	
ROOM #	Subtractive <u>X</u>	SECONDARY/LOW <u>8.4</u>	
SERIAL # <u>966001811</u>	% Z	KVA	MVA
LAMBERT COORDINATES: N <u>E</u>	<u>6.1</u>	<u>1500</u>	

MEGGAR READINGS		HI-GR _____ LO-GR _____ HI-LO _____	OIL TEMP <u>16°</u>	KELVIN BRIDGE READINGS - Primary				
TAP	% OF CHANGE	T T R		Ranges: I <u>500M</u> Ω <u>2</u>				
		H 1 H 2 H 3 H 1	% I	H 1 H 2 H 3 H 1				
		X 1 X 2 X 3 X 1						
1 or A	<u>105</u>	<u>6.036</u>	<u>6.033</u>	<u>6.035</u>	<u>1049</u>	<u>.865</u>	<u>.922</u>	<u>.916</u>
2 or B	<u>102.5</u>	<u>5.896</u>	<u>5.895</u>	<u>5.896</u>		<u>.851</u>	<u>.900</u>	<u>.894</u>
3 or C	<u>100</u>	<u>5.755</u>	<u>5.754</u>	<u>5.754</u>		<u>.827</u>	<u>.880</u>	<u>.873</u>
4 or D	<u>72.5</u>	<u>5.606</u>	<u>5.605</u>	<u>5.605</u>		<u>.807</u>	<u>.858</u>	<u>.850</u>
5 or E	<u>95</u>	<u>5.466</u>	<u>5.464</u>	<u>5.465</u>		<u>.787</u>	<u>.838</u>	<u>.830</u>
6 or F								
7 or G								

OK		OIL TEMP <u>16°</u>	KELVIN BRIDGE READINGS -Secondary	
OK	Paint		Ranges: I <u>500M</u> Ω <u>2</u>	
OK	Numbers / Labels	% I	X 1 X 2 X 3 X 1	
OK	Valves			
OK	Primary Bushings	<u>105.1</u>	<u>.017</u>	<u>.017</u>
OK	Secondary Bushings	POLARIZATION INDEX		
OK	Gaskets	1 MIN 10 MIN		
OK	Tap Changer	PRI: 2500V		
OK	Nitrogen Blanket	SEC: 500V		
OK	Grounds	PRI - SEC		
Y / N		PRI - GRD		
	Replaced Nitrogen Cylinder	SEC - GRD		
	Replaced Fluid - type of fluid:			

	Added Fluid - (Specify amount in Comment Section)
	Replaced/Repaired Gaskets - (Describe specifics in Comment Section)
	Replaced/Repaired Bushings - (Describe specifics in Comment Section)
	Replaced/Repaired Valves - (Describe specifics in Comment Section)
	Other - (Describe specifics in Comment Section)

COMMENTS:

COPY

CHECKED BY: WC/ma/rtDATE 12.6.96

DRAFT

ELECTRICAL UTILITY SECTION		CABLE D.C. HY-POT STEP VOLTAGE TEST									
DATE <i>12-7-76</i>		TEMP. (Celsius) <i>5</i>		HUM. <i>76%</i>		CABLE OR LINE <i>E8X371</i>					
FROM <i>C6706E</i>						TO <i>E8X371</i>					
AREA <i>200E</i>		CABLE MFR. <i>SOUTHWIRE</i> <i>DIRECT BURIAL</i>						RATED KV <i>5KV</i>			
INS. TYPE <i>EPR</i>		INS. THICK. <i>15 mil</i>		NO. OF COND. <i>6-2/0</i>		TYPE OF COND. <i>STRANDED C.C.</i>					
COND. SIZE <i>500mm</i>		CABLE LENGTH <i>295 ft.</i> m.		SHIELD TYPE <i>NON SHIELDED</i>		JACKET TYPE		SEMI COND. TYPE			
SHIELD RES. $\Rightarrow$		A0 - GND		A0 - GND		A0 - GND		B0 - GND		B0 - GND	
		A0 - B0		A0 - B0		A0 - B0		B0 - C0		B0 - C0	
TEST KV		TIME INT.		CURRENT READING							
				CONDUIT NUMBERS							
5 KV CABLE		15 KV CABLE		A0		B0		C0			
5		15		32		0		0		0	
10		20				0		0		0	
15		25				0		0		0	
20		30				0		0		0	
25		35				0		0		0	
25		40				0		.3		0	
		45									
		50									
		53									
		55									
HAS CABLE BEEN RECONNECTED TO EQUIPMENT? () YES () NO						HAVE ALL GROUNDS BEEN REMOVED? () YES () NO					
REMARKS:											
COPY											
TESTED BY <i>RA/MIA/IVC</i>						CHECKED BY			DATE		

CONTINUED ON REVERSE

DRAFT

ELECTRICAL UTILITY SECTION		CABLE D.C. HY-POT STEP VOLTAGE TEST							
DATE 12/9/96		TEMP. (Celsius) 10		HUM. 62%		CABLE OR LINE C846-38-1			
FROM C8X634				TO C8X635 C6705.1E					
AREA 200E		CABLE MFR. GENERAL				RATED KV 15			
INS. TYPE XLPE		INS. THICK 133%		NO. OF COND. 3/10		TYPE OF COND. C4			
COND. SIZE 4/0		CABLE LENGTH 90 ft. m.		SHIELD TYPE C4 RIBBON		JACKET TYPE		SEMI COND. TYPE	
SHIELD RES →		A0 - GND	A0 - GND	A0 - GND	B0 - GND	B0 - GND	B0 - GND	C0 - GND	C0 - GND
		A0 - B0	A0 - B0	A0 - B0	B0 - C0	B0 - C0	B0 - C0	C0 - A0	C0 - A0
TEST KV		TIME INT.		CURRENT READING					
5 KV CABLE	15 KV CABLE			CONDUIT NUMBERS					
5	15	20	13		13			13	
10	20		13		13			13	
15	25		13		13			13	
20	30		13		13			13	
25	35		13		13			13	
25	40		12		12			12	
	45		12		12			12	
	50		12		12			12	
	53		12		12			12	
	55		12		12			12	
HAS CABLE BEEN RECONNECTED TO EQUIPMENT? [] YES [] NO				HAVE ALL GROUNDS BEEN REMOVED? [] YES [] NO					
REMARKS:									
COPY									
TESTED BY LB/RH/KiJ				CHECKED BY				DATE	

CONTINUED ON REVERSE

EUM-059
Page 1 of 2
Rev 3 - 12/28/94

CONTINUED ON REVERSE

ELECTRICAL UTILITIES CABLE DATA

12/06/96

EU-001
Rev. 4 12/14/92

Cable Number: C8L6-38-1
(CIRCUIT - RUN - CONDUCTOR NUMBER)

Project #: PUREX Installation Date: 11/96 Date Removed: / /
mo/yr

Area: 200E Station: _____

Buildings Fed: 202A

From: C8X634 To: C8X635 @C6705E

Manufacturer: GENERAL Phase (1/3): 3 Number of Conductors: 3

Size: 40 Rated KV: 15.0 Operating KV: 13.8
AWG ☒ MCM ☐

Insulation - Type: _____ Level: _____ % Thickness: _____
EPR ☐ 100% ☐
XLP ☐ 133% ☒
PVC ☐ 175% ☐
CPE ☐
OTHER ☐ XLPE

Length: 90 ft. _____ 0.0 m.

Shielded? (Y/N): Y Shield Type: CU RIBBON

Jacket: _____ Conductor Type: STRANDED Mfg. Date: /
NEOPRENE ☐ ALUMINUM ☐ mo/yr
CSP ☐ COPPER ☒
PVC ☒ OTHER ☐
CPE ☐
OTHER ☐ ARMOR-FLEX

Temperature Rating: 90 Drawing #: _____

Notes: _____

Form Filled Out By R Hart Date 12/3/96

Data Entered By _____ Date _____

COPY

ELECTRICAL UTILITIES CABLE DATA

EU-001
Rev. 4 12/14/92

12/06/96

Cable Number: E8L6-1-1
(CIRCUIT - RUN - CONDUCTOR NUMBER)Project #: PUREX Installation Date: 11/96 Date Removed: 1/1
mo/yrArea: 200E Station: _____Buildings Fed: 202AFrom: C6705E To: E8X369Manufacturer: SOUTHWIRE Phase (1/3): 3 Number of Conductors: 6Size: 500 Rated KV: 5.0 Operating KV: 2.4AWG ☐
MCM ☒Insulation - Type: _____ Level: % Thickness: .090
EPR ☒ 100% ☐
XLP ☐ 133% ☒
PVC ☐ 175% ☐
CPE ☐
OTHER ☐Length: 275 ft. 0.0 m.Shielded? (Y/N): N Shield Type: _____Jacket: DIRECT BURIAL Conductor Type: STR Mfg. Date: 1/95
mo/yr
NEOPRENE ☐ ALUMINUM ☐
CSP ☐ COPPER ☒
PVC ☐ OTHER ☐
CPE ☐
OTHER ☐ ARMORTemperature Rating: 90 Drawing #: _____

Notes: _____

Form Filled Out By Cowley Date 12-7-96

Data Entered By _____ Date _____

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HNF-SD-CP-ATR-089, REV. 0

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Identification Panel

COMPANY: Westinghouse Hanford Company
 LOCATION: 200E PUREX
 CCT DESIG:

DIVISION: UTILITIES
 SPECIAL ID: C6706E

WO #: 6B9500568

RETEST DATE:

Transformer Nameplate Data TEST CONDITIONS
 MFR: CPS SERIAL #: 966001812 PH: 3 DATE: Dec 06 1996
 YEAR MFR: 1996 TYPE: CFG: D-D WEATHER: NIGHT RH: 65%
 kV: 13.8/2.4 kVA: 1500/ / // AIR TEMP: 12°C
 TANKTYPE: N2 BLANKETED COOLNT: OIL V: 485 UG TOP OIL TEMP: 20°C

Bushing Nameplate				C1		C2				
BUSH	SERIAL #	MFR	TYPE	%PF	C(pF)	%PF	C(pF)	kV	AMPS	YEAR
H1										
H2										
H3										
H0										
X1										
X2										
X3										
X0										

COPIES TO: LAMM/DOBLE LAST TEST DATE:

LAST SHT #:

TEST SET TYPE: M4K INS #: 491 XFMR #: 516

REASON FOR TEST: ACCEPTANCE

TESTED BY: WCMARH APPRV BY:

APPRV DATE:

SHT #: 2-C-6706-1996

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

Overall Tests

LINE NI	TEST CONNECTIONS				TEST kV	Equiv. 10kV		% PWR FCTR		corr fctr	WND meas C(pF)	MEASURED	INS RTG
	ENG	GND	GAR	UST		mA	Watts	meas	corr				
1	HIGH	LOW			10	35.880	1.004			1.01	9518	CH + CHL	
2	HIGH		LOW		10	9.084	0.265	0.29	0.29	1.01	2409	CH	G
3	HIGH			LOW	10	26.790	0.761	0.28	0.28	1.01	7107	CHL(UST)	G
4	TEST 1 MINUS TEST 2					26.796	0.739	0.28	0.28	1.01	7109	CHL	G
5	LOW	HIGH			2.5	49.030	1.509			1.01	13006	CL + CHL	
6	LOW		HIGH		2.5	22.230	0.757	0.34	0.34	1.01	5898	CL	G
7	LOW			HIGH	2.5	26.790	0.757	0.28	0.28	1.01	7106	CHL(UST)	G
8	TEST 5 MINUS TEST 6					26.800	0.752	0.28	0.28	1.01	7108	CHL	G
9	CH MINUS BUSHING C1 MEAS									1.01		CH'	
10	CL MINUS BUSHING C1 MEAS									1.01		CL'	

<**** IWC DETAIL ****>

LINE	<mA>			mult	<Watts>			mult	<pF>			mult
	meter				meter				meter			
1	35.88/35.88	1	/1		1.004/1.004	1	/1		9518./9518.	1	/1	
2	9.084/9.084	1	/1		0.265/0.265	1	/1		2409./2409.	1	/1	
3	26.79/26.79	1	/1		0.761/0.761	1	/1		7107./7107.	1	/1	
5	49.03/49.03	1	/1		1.509/1.509	1	/1		13006/13006	1	/1	
6	22.23/22.23	1	/1		0.757/0.757	1	/1		5898./5898.	1	/1	
7	26.79/26.79	1	/1		0.757/0.757	1	/1		7106./7106.	1	/1	

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

Hot-collar Tests

TEST # NI	BUSH #	SERIAL #	CNTR COND	COLLAR UNDER SKT #	TEST kV	Equiv. 10kV		INS RTG
						mA	Watts	
1	X1		GROUND	2	10	0.086	0.018	G
2	X2		GROUND	2	10	0.088	0.022	G
3	X3		GROUND	2	10	0.086	0.026	G

<**** IWC DETAIL ****>

LINE	<mA>		<Watts>		<pF>	
	meter	mult	meter	mult	meter	mult
1	0.086/0.086	1	0.018/0.018	1	/	/
2	0.088/0.088	1	0.022/0.022	1	/	/
3	0.086/0.086	1	0.026/0.026	1	/	/

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

Oil Sample Test Tests

TEST # NI	SAMPLE LOCATION	TMP °C	TEST kV	Equiv. 10 kV		% PWR FCTR		corr fctr	INS RTG
				mA	Watts	meas	corr		
1	SAMPLE VALVE	6.0	10	0.900	0.001	0.01	0.01	1.47	G

<**** IWC DETAIL ****>

LINE	meter	<mA>	mult	meter	<Watts>	mult	meter	<pF>	mult
1	0.900/0.900	1	/1	0.001/0.001	1	/1	/		/

<**** EXPLANATION(S) ****>

- N/A -

<**** NOTE(S) ****>

- N/A -

COPY

TRANSFORMER WORK SHEET

REV 10 - 02/14/94

TRANSFORMER # C6706E

WORKPACKAGE # <u>68-9500548</u>	LOCATION <u>PUREX</u>	AREA <u>2006</u>	STATION
MANUFACTURER: <u>COOPER</u>	POLARITY	VOLTAGE:	
FACILITY LOCATED IN: _____	Additive _____	PRIMARY/HIGH	<u>13.8</u>
ROOM # _____	Subtractive <u>1</u>	SECONDARY/LOW	<u>2.4</u>
SERIAL # <u>966001812</u>	% Z	KVA	MVA
LAMBERT COORDINATES: N _____ E _____	<u>6.1</u>	<u>1500</u>	

MEGGAH READING		HI-GR <u>0</u>	LO-GR <u>2</u>	HI-LO <u>2</u>	OIL TEMP <u>20°</u>	KELVIN BRIDGE READINGS - Primary								
TAP	% OF CHANGE	T T R						Ranges: I <u>50MA</u> Ω <u>2</u>						
		H 1 X 1	H 2 X 2	H 2 X 2		H 3 X 3	H 3 X 3	H 1 X 1	% I	H 1	H 2	H 2	H 3	H 3
1 or A	<u>105</u>	<u>6.037</u>	<u>6.035</u>	<u>6.035</u>	<u>105</u>	<u>.922</u>	<u>.918</u>	<u>.871</u>						
2 or B	<u>102.5</u>	<u>5.867</u>	<u>5.896</u>	<u>5.875</u>		<u>.906</u>	<u>.898</u>	<u>.848</u>						
3 or C	<u>100</u>	<u>5.756</u>	<u>5.755</u>	<u>5.753</u>		<u>.885</u>	<u>.877</u>	<u>.827</u>						
4 or D	<u>92.5</u>	<u>5.606</u>	<u>5.606</u>	<u>5.605</u>		<u>.866</u>	<u>.855</u>	<u>.804</u>						
5 or E	<u>95</u>	<u>5.466</u>	<u>5.465</u>	<u>5.465</u>		<u>.847</u>	<u>.835</u>	<u>.783</u>						
6 or F														
7 or G														

OK		OIL TEMP <u>20°</u>	KELVIN BRIDGE READINGS -Secondary					
Ranges: I <u>50MA</u> Ω <u>2</u>								
✓	Paint	% I	X 1	X 2	X 2	X 3	X 3	X 1
✓	Numbers / Labels	<u>105.1</u>	<u>.017</u>	<u>.017</u>	<u>.017</u>	<u>.017</u>	<u>.017</u>	<u>.017</u>
✓	Valves	POLARIZATION INDEX						
✓	Primary Bushings			1 MIN		10 MIN		
✓	Secondary Bushings	PRI: 2500V						
✓	Gaskets	SEC: 500V						
✓	Tap Changer	PRI - SEC						
✓	Nitrogen Blanket	PRI - GRD						
✓	Grounds	SEC - GRD						
Y / N								
	Replaced Nitrogen Cylinder							
	Replaced Fluid - type of fluid:							
	Added Fluid - (Specify amount in Comment Section)							
	Replaced/Repaired Gaskets - (Describe specifics in Comment Section)							
	Replaced/Repaired Bushings - (Describe specifics in Comment Section)							
	Replaced/Repaired Valves - (Describe specifics in Comment Section)							
	Other - (Describe specifics in Comment Section)							

COMMENTS:

7/90WAUKESHA, WI.5210-12-110, 578485 GRD oil

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CHECKED BY:

WC/MA/RL

DATE

12.16 96

DRAFT

HNF-SD-CP-ATR-089, REV. 0
Page 320EUM-059
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Rev 3 - 12/28/99

ELECTRICAL UTILITY SECTION		CABLE D.C. HY-POT STEP VOLTAGE TEST																	
DATE 12/9/96		TEMP. (Celsius) 10		HUM. 78%		CABLE OR LINE CFL8-2-1													
FROM C8X641				TO C8X640 C6706E															
AREA 200W		CABLE MFR. GENERA						RATED KV 15											
INS. TYPE XLPE		INS. THICK 133%		NO. OF COND. 3/10		TYPE OF COND. C11													
COND. SIZE 4/0		CABLE LENGTH 90 ft. m.		SHIELD TYPE CU 2 BBN		JACKET TYPE ALMO2/FLEX		SEMI COND. TYPE											
SHIELD RES ⇒		A0 - GND		A0 - GND		A0 - GND		B0 - GND		B0 - GND		B0 - GND		C0 - GND		C0 - GND		C0 - GND	
		A0 - B0		A0 - B0		A0 - B0		B0 - C0		B0 - C0		B0 - C0		C0 - A0		C0 - A0		C0 - A0	
TEST KV		TIME INT.		CURRENT READING															
5 KV CABLE		15 KV CABLE		A0 B0 C0															
				CONDUIT NUMBERS															
5		15		.2				.4		.2				.2					
10		20		.2				.6		.2				.2					
15		25		.2				.6		.2				.3					
20		30		.2				.8		.2				.2					
25		35		.2				1.0		.2				.2					
25		40		.2				1.2		.2				.2					
		45		.2				1.3		.3				.3					
		50		.2				1.5		.5				.2					
		53		.2				1.6		.5				.2					
		55		.2				1.7		.6				.2					
HAS CABLE BEEN RECONNECTED TO EQUIPMENT? () YES () NO				HAVE ALL GROUNDS BEEN REMOVED? () YES () NO															
REMARKS:																			
COPY																			
TESTED BY LB 124 /KV				CHECKED BY												DATE			

CONTINUED ON REVERSE

ELECTRICAL UTILITIES CABLE DATA

12/06/96

EU-001
Rev. 4 12/14/92

Cable Number: C8L8-2-1
(CIRCUIT - RUN - CONDUCTOR NUMBER)

Project #: PUREX Installation Date: 11/96 Date Removed: / /
mo/yr

Area: 200E Station: _____

Buildings Fed: 202A

From: C8X641 To: C8X640 @C6706E

Manufacturer: GENERAL Phase (1/3): 3 Number of Conductors: 3

Size: 4/0 Rated KV: 15.0 Operating KV: 13.8
AWG ☒
MCM ☐

Insulation - Type: _____ Level: _____ % Thickness: _____
EPR ☐ 100% ☐
XLP ☐ 133% ☒
PVC ☐ 175% ☐
CPE ☐
OTHER ☐ XLPE]

Length: 90 ft. 0.0 m.

Shielded? (Y/N): Y Shield Type: Cu RIBBON

Jacket: _____ Conductor Type: STRANDED Mfg. Date: /
NEOPRENE ☐ ALUMINUM ☐ mo/yr
CSP ☐ COPPER ☒
PVC ☒ OTHER ☐
CPE ☐
OTHER ☐ ARMOR-FLEX

Temperature Rating: 90 Drawing #: _____

Notes: _____

Form Filled Out By R. Hart Date 12/9/96

Data Entered By _____ Date _____

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ELECTRICAL UTILITIES CABLE DATA

12/06/96

EU-001
Rev. 4 12/14/92

Cable Number: E8L8-3-1
(CIRCUIT - RUN - CONDUCTOR NUMBER)

Project #: PUREX Installation Date: 11/96 Date Removed: / /
mo/yr

Area: 200E Station: _____

Buildings Fed: 202A

From: C6706E To: E8X371

Manufacturer: SOUTHWIRE Phase (1/3): 3 Number of Conductors: 6

Size: 500 Rated KV: 5.0 Operating KV: 2.4
AWG ☐
MCM ☒

Insulation - Type: _____ Level: _____ % Thickness: .090
EPR ☒ 100% ☐
XLP ☐ 133% ☒
PVC ☐ 175% ☐
CPE ☐
OTHER ☐ _____]

Length: 295 ft. _____ 0.0 m.

Shielded? (Y/N): N Shield Type: _____

Jacket: DIRECT BURIAL Conductor Type: STR. Mfg. Date: 195
mo/yr
NEOPRENE ☐ ALUMINUM ☐
CSP ☐ COPPER ☒
PVC ☐ OTHER ☐
CPE ☐
OTHER ☐ ARMOR]

Temperature Rating: 90 Drawing #: _____

Notes: SOUTHWIRE DIRECT BURIAL
ARMOR JACKET

Form Filled Out By Chadly Date 12-7-96

Data Entered By _____ Date _____

COPY

SECTION 9

**RELAY SETTING CHANGES BASED ON OPERATIONAL
EXPERIENCE**

Table 8.B

SET POINT RECORD SHEET

Program Date 3/27/97 Control Schematic _____
 Unit ID/Starter Type FANS 1,2,3 W. Order # _____
 Motor HP 200 Mfr. Siemens/Allis Serial _____ Volts 2400V
 FLA 49/50 LRA _____ Stall Time _____ Accel Time _____
 SF 1 RTD Type _____ Other _____

Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
0	S VER XX SOFTWARE VERSION NUMBER ³	N/A	N/A	
1	X PHASE SINGLE PHASE TEST MODE OR THREE PHASE PROTECTION MODE	<u>3 Phase</u>	Toggles between 1 PHASE and 3 PHASE	
2	RTD IN X RTD TEMP IN DEGREES F OR DEGREES C	<u>C</u>	Toggles between RTD IN F and RTD IN C	
3	WD T XXX WINDING TEMP TRIP IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
4	MB T XXX MOTOR BEARING TRIP IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
5	LB T XXX LOAD BEARING TRIP IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
6	AX T XXX AUXILIARY TRIP IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
7	WD A XXX WINDING TEMP ALARM IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
8	MB A XXX MOTOR BEARING ALARM IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
9	LB A XXX LOAD BEARING ALARM IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
10	AX A XXX AUXILIARY ALARM IN DEGREES	<u>0</u>	0-199°C / 32-390°F (1° incre.)	
11	GF XX GROUND FAULT TRIP LEVEL IN AMPS	<u>1</u>	1-12 amps (1 amp. incre.)	12
12	GFSD XX GROUND FAULT START DELAY IN CYCLES	<u>6</u>	1-20 AC cycles (1 cycle incre.)	
13	GFRD XX GROUND FAULT RUN DELAY IN CYCLES	<u>5</u>	0-10 AC cycles (1 cycle incre.)	0
14	IOC XX ENABLE OR DISABLE INSTANTANEOUS OVERCURRENT FUNCTION	<u>OFF</u>	Toggles between IOC ON and IOC OFF displays	IOC OFF
15	IOC XXXX INSTANTANEOUS OVERCURRENT IN % FLA ⁵	<u>-</u>	300-1600% (1% incre.)	



Values Changed
From Original

Table 8.B

SET POINT RECORD SHEET
(Cont'd)

Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
16	IOCSD XX INSTANTANEOUS OVERCURRENT START DELAY IN CYCLES	—	1-20 cycles (1 cycle incre.)	
17	LRC XXXX LOCKED ROTOR CURRENT IN % FLA	700	300 to 1200% (1% incre.)	
18	LRT XX MAXIMUM ALLOWABLE STALL TIME IN SECONDS	6	1-60 sec. (1 sec. incre.)	
19	UTC XXX ULTIMATE TRIP CURRENT IN % FLA	120	85-125% (1% incre.)	
20	I ² T XXX I ² T ALARM LEVEL IN % I ² T TRIP	75	60-100% (1% incre.)	100
21	MAN RST ⁴ AUTO RST ⁴ AUTO OR MANUAL I ² T RESET	MAN RST	Toggles between MAN RST and AUTO RST displays	
22	JM A XXXX JAM ALARM LEVEL IN % FLA	150	100-1200% (1% incre.)	1200
23	JM T XXXX JAM TRIP LEVEL IN % FLA	200	100-1200% (1% incre.)	1200 ⁶
24	JAMS XX JAM START DELAY IN SECONDS	6	0-60 sec. (1 sec. incre.)	
25	JAMR XXX JAM RUN DELAY IN SECONDS	5	0-240 sec. (1 sec. incre.)	240
26	UL A XX UNDERLOAD ALARM LEVEL IN % FLA	65	0-90% (1% incre.)	0
27	UL T XX UNDERLOAD TRIP LEVEL IN % FLA	45	0-90% (1% incre.)	0
28	ULSD XXX UNDERLOAD START DELAY IN SECONDS	6	0-100 sec. (1 sec. incre.)	
29	ULRD XX UNDERLOAD RUN DELAY IN SECONDS	10	1-10 sec. (1 sec. incre.)	1
30	PU A XX PHASE UNBALANCE ALARM LEVEL	10	10-50% (1% incre.)	50 ⁶
31	PURD XXX PHASE UNBALANCE ALARM RUN DELAY IN SECONDS	3	0-240 sec. (1 sec. incre.)	
32	I ² T TRIP ⁴ 2 SEC ⁴ 2 SECOND DELAY OR I ² T TRIP ON PHASE UNBALANCE	2	Toggles between I ² T TRIP and 2 SEC displays	
33	ST/T XX STARTS PER TIME ALLOWED	2	1-10 starts/ time (incre. of 1)	1

Table 8.B
SET POINT RECORD SHEET
(Cont'd)

Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
34	T/ST X TIME ALLOWED FOR STARTS COUNT IN MINUTES	60	0 to 240 minutes duration (1 minute incr.)	0
35	OP COUNT ⁴ RST OCNT ⁴ RESET FOR OPERATIONS COUNTER	OP Count	Toggles between OP COUNT and RST OCNT	OP COUNT
36	RUN TIME ⁴ RST RT ⁴ RESET FOR RUN TIME	Run Time	Toggles between RUN TIME and RST RT displays	RUN TIME
37	TRNC XXX MOTOR START TRANSITION CURRENT LEVEL IN % FLA	150	50-150% (1% incre.)	150
38	TRNT XXX MOTOR START TRANSITION TIME IN SECONDS	0	0-240 sec. (1 sec. incre.)	0
39	TRN TOUT ⁴ TRP TOUT ⁴ TRANSITION OR TRIP ON TIME OUT	TRN TOUT	Toggles between TRN TOUT and TRP TOUT displays	TRN TOUT
40	INSQ XX INCOMPLETE SEQUENCE REPORT BACK TIME IN SECONDS	1	1-60 sec. (1 sec. incre.)	
41	ABKS XXX ANTI-BACKSPIN DELAY TIME IN SECONDS	0	0-600 sec.	0
42	FLA XXXX FULL-LOAD AMPS	50	10-3000 amps (1 amp incre.)	
43	FREQ 50 ⁴ FREQ 60 ⁴ 50 OR 60 HERTZ LINE FREQUENCY	60	Toggles between FREQ 50 and FREQ 60 displays	
44	MODE 1 ⁴ MODE 2 ⁴ TRIP MODE 1 — TRIP RELAY ENERGIZES ON TRIP CONDITION ⁴ TRIP MODE 2 — TRIP RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES ON TRIP CONDITION ⁴	Mode 1	Toggles between MODE 1 and MODE 2	
45	NON REV ⁴ REV ⁴ REVERSING OR NONREVERSING STARTER	Non Rev	Toggles between REV and NONREV displays	

Table 8.B
SET POINT RECORD SHEET
(Cont'd)

Item No.	Program Menu Display ^{1,2}	Selected Value	Set Point Ranges Selection	Set Point Disable Value
46	REM RST ⁴ REM TRIP ⁴ DIF TRIP ⁴ MTR STOP ⁴ RST DBL ⁴ REMOTE INPUT — RST FOR REMOTE RESET — TRIP FOR REMOTE TRIP — DIF TRIP FOR DIFFERENTIAL TRIP — MTR STOP FOR MOTOR STOP DETECTION — RST DBL FOR RESET DISABLE	Rem RST	Toggles between REM TRIP, REM RST, DIF TRIP, MTR STOP	
47	MAX XXX ⁴ 4-20 MA MAX OUTPUT — 100 FOR 100 PERCENT FLA — 125 FOR 125 PERCENT FLA — %I2T FOR PERCENT I2T TRIP — WRD FOR MAXIMUM WINDING RTD TEMP	100	Toggles between MAX100, MAX125, MAX%i2T and MAXWRD displays	
48	AUX XXXX TRIP STATE FOR AUX TRIP RELAY	All	Toggles between ALL, IOC, I2T, GFLT, JAM, UL, MBT, LBT, WT and REV displays ⁴	
49	TRIP XXX RESET FOR NUMBER OF TRIPS	TRIP CNT	Toggles between TRIP CNT and TRIP RST displays ⁴	TRIP CNT
50	MAX XXX RESET FOR MAXIMUM VALUES	Mx Reset	Toggles between MX R-EBL, MX RESET and MX R-DBL displays ⁴	MX R-DBL
51	XXX PGM ENABLE UNIT TO BE PROGRAMMED WHILE MOTOR IS RUNNING	Stop PGM	Toggles between RUN PGM and STOP PGM	
52	X/5 XXXX CT RATIO — X TURNS TO 5	75	Available CT turns: 5 ratios are: 10, 20, 25, 40, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, 4000	

NOTES:

1. The letters X used here represent the setpoint variables.
2. Press the Help pushbutton to initiate the help display of the complete message shown here. The display scrolls right to left.
3. The software version number is used by Westinghouse. There is no selection associated with it. All correspondence with Westinghouse should refer to the specific software version number installed in the IQ-1000 II.
4. One of these choices must be selected.
5. IOC trip setting should be lower than your Fuse Interrupting Rating or your Contactor Withstand Rating.
6. Set start and run delays to maximum values to disable trip/alarm functions.

REVISED RELAY SETTINGS

BE1-32R POWER RELAYS ON MAIN BREAKERS #1 & #2

SETTINGS WERE CHANGED FROM TAP A-LO TO TAP C-HI.

THIS CHANGED PICKUP WATTS FROM 1.5 TO 18 DUE TO
NUISANCE TRIPS CAUSED BY UNBALANCED INRUSH CURRENT
WHEN STARTING SUBSTATION 37.5KVA SINGLE PHASE TRANSFORMER.

MULTILIN SR750 RELAYS ON MAIN BREAKERS #1 & #2

SETTINGS WERE CHANGED ON THE BUS UNDERVOLTAGE 1 PROTECTION
SETPPOINTS FROM .92 X BUS VOLTAGE TO .85 X BUS VOLTAGE WITH A
TIME DELAY CHANGE FROM 2.0 SECONDS TO 10 SECONDS FOR PICKUP.

THIS CHANGE WAS DUE TO NUISANCE TRIPS CAUSED BY STARTING A
CANYON EXHAUST FAN WITH THE DAMPERS FULLY OPEN. VOLTAGE
DIPPED TO .91 X BUS VOLTAGE WITH A LONGER TIME DELAY THAN
2.0 SECONDS FOR THE FAN TO COME UP TO SPEED.

MULTILIN SR750 RELAYS ON FEEDER BREAKERS

SETTINGS WERE CHANGED ON THE BUS UNDERVOLTAGE 1 PROTECTION
SETPPOINTS FROM .92 X BUS VOLTAGE TO .90 X BUS VOLTAGE WITH A
TIME DELAY CHANGE FROM 2.0 SECONDS TO 3 SECONDS FOR PICKUP.

THIS CHANGE WAS DUE TO NUISANCE TRIPS CAUSED BY STARTING A
CANYON EXHAUST FAN WITH THE DAMPERS FULLY OPEN. VOLTAGE
DIPPED TO .91 X BUS VOLTAGE WITH A LONGER TIME DELAY THAN
2.0 SECONDS FOR THE FAN TO COME UP TO SPEED.

IQ 1000 II MOTOR PROTECTION RELAYS

THE FOLLOWING CORRECTIONS WERE MADE TO THE PROGRAM TO MATCH
MOTOR RUNNING AND STARTING CHARACTERISTICS.

CT RATIO CHANGED TO 75/5 TO MATCH ACTUAL INSTALLATION.

LOCKED ROTOR CURRENT CHANGED TO 7 X FLA (50A) - ACTUAL
OBSERVED 6.9 X FLA.

UNDERLOAD ALARM POINT 65% OF FLA = 32.5A TO BE UNDER
OBSERVED RUNNING LOAD CURRENTS OF 33A TO 36A.

TIME DELAYS FOR PICKUP WERE EXTENDED TO 5 TO 6 SECONDS TO
MATCH MOTOR STARTING CHARACTERISTICS.

UNDERLOAD TRIP POINT RESET TO 45% OF FLA TO AVOID NUISANCE
TRIPS

DISTRIBUTION SHEET

To PUREX DEACTIVATION PROJECT	From PUREX ELECTRICAL COGNIZANT ENG.	Page 1 of 1
		Date 5/9/97
Project Title/Work Order PUREX ELECTRICAL SUBSTATION ATR		EDT No. 621328
		ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
DE NELSON	N2-05	X			
RE HOWARD	L1-01	X			
MW ELLIS	S6-01	X			
WA PEIFFER	S6-19	X			
JP HAYFIELD	S6-19	X			
KY MILLER	N2-13	X			
CG AYRAN	X5-53	X			
G. MACFARLAN	X5-53	X			
WD DOGGETT	T4-20	X			
AD HJELLUM	S2-54	X			
DC LARSON	S6-01	X			
BK WILMOTH	S6-01	X			