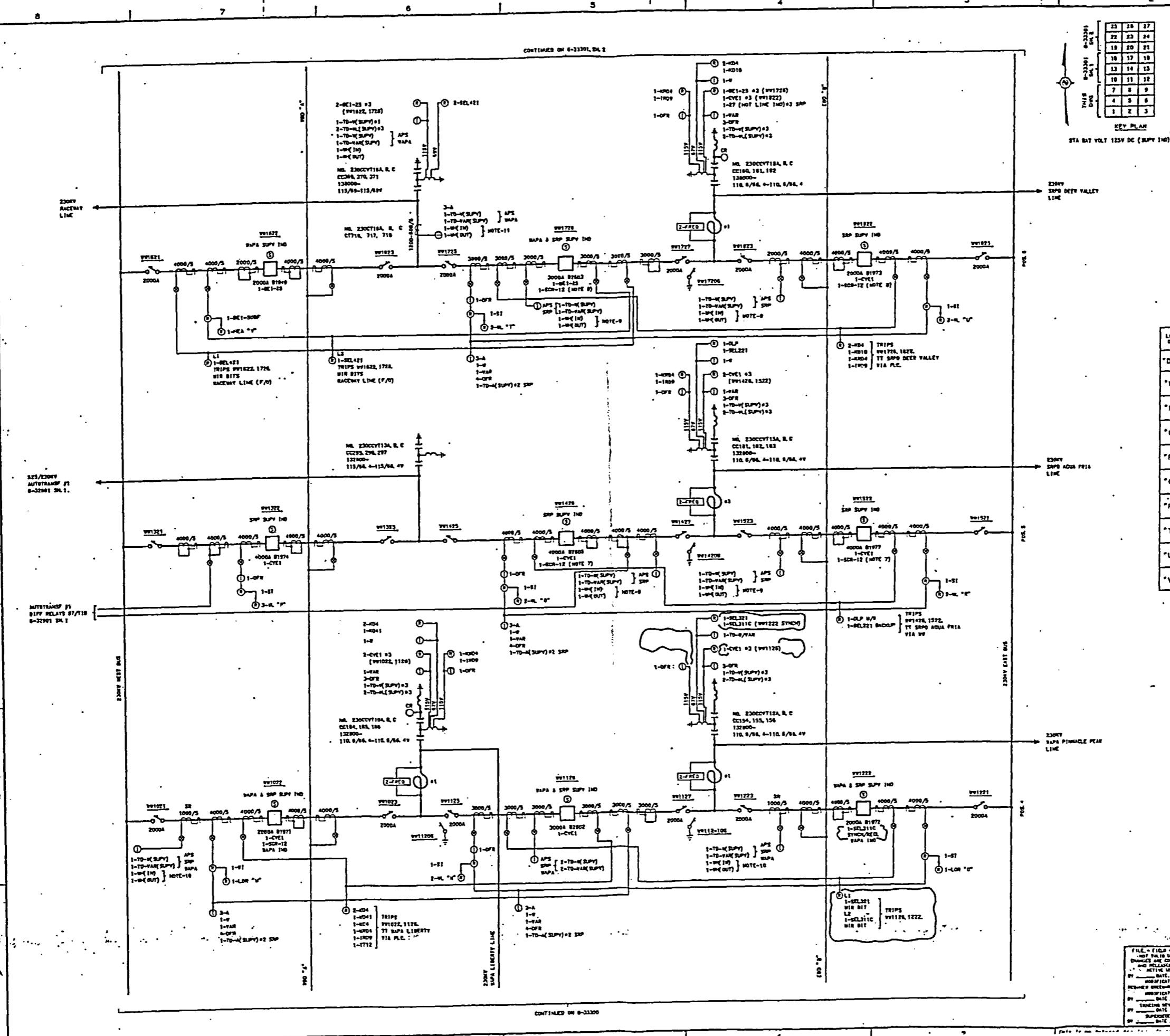


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REFERENCE DWGS. PHASING & KEY DIAG. G-33302

25	26	27
18	19	20
12	13	14
6	7	8
1	2	3

KEY PLAN
STA BAT VOLT 125V DC (SUPV 140)

- NOTES:
1. LOCKOUT LEGEND AND PANEL LOCATION DATA SHALL BE SHOWN ONLY ONCE FOR EACH LOCKOUT AND SHALL APPEAR ON THE ONE LINE DIAGRAM SHEET SHOWING THE LOCKOUT RELAY (SYMBOL).
 2. ALL CT'S & PT'S ARE IN SETS OF THREE (3) UNLESS DESIGNATED OTHERWISE.
 3. ALL CT'S ARE MULTIRATIO (MR) UNLESS DESIGNATED OTHERWISE.
 4. ALL 230KV SWITCHES ARE 4000A UNLESS NOTED OTHERWISE.
 5. (S) SUPERVISORY CONTROL & INDICATION
 6. (E) CT REMANENCE SWITCH
 7. ONE (1) RESETTING RELAY (SCR-12) IS PROVIDED FOR THE SPP ACUA FRIA LINE AND MAY BE SWITCHED BY RECLOSER SELECTOR SWITCH TO BE ON EITHER W/1126 OR W/1122.
 8. ONE (1) RESETTING RELAY (SCR-12) IS PROVIDED FOR THE SPP DEER VALLEY LINE AND MAY BE SWITCHED BY RECLOSER SELECTOR SWITCH TO BE ON EITHER W/1127 OR W/1123.
 9. THE SPP ACUA FRIA & DEER VALLEY LINE W/ (IN & OUT) ARE TOTALIZED (SST-3) AND THE RESULTING SIGNAL RECORDED ON RECORDED BY LOCAL DEMAND METERS (2-POS). DEMAND METER OUTPUTS ARE TELEMETTERED TO APS & SPP VIA SUPV.
 10. THE WAPA LIBERTY & PINEA PEAK LINE W/ (IN & OUT) ARE INDIVIDUALLY TELEMETTERED TO WAPA VIA SUPV. THE WAPA LINE W/ (IN & OUT) ARE TOTALIZED (SST-3) AND THE RESULTING SIGNAL TELEMETTERED TO APS & WAPA VIA SUPV.
 11. THE RACEWAY LINE W/ (IN & OUT) ARE TELEMETTERED TO APS & WAPA VIA SUPV.

LOCK OUT	FUNCTION	PANEL LOC.	SUPV 140	DESCRIPTION
"DT"	TT REC (PLC) SPP DEER VALLEY	74F		TRIPS & BLOCKS CLOSING W/1127, 1122.
"M"	230KV W/1122 BUS FAIL	45F	X	TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 2026. TT SPP ACUA FRIA VIA P.L.C.
"N"	230KV W/1126 BUS FAIL	45F		TRIPS & BLOCKS CLOSING W/1126, 1122. TT WAPA LIBERTY VIA P.L.C. DIT WAPA PINE PE.
"O"	230KV W/1122 BUS FAIL	45F	X	TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 2026. DIT WAPA PINE PE.
"P"	230KV W/1122 BUS FAIL	55F		TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 2026. TT SPP ACUA FRIA VIA P.L.C.
"Q"	230KV W/1126 BUS FAIL	55F		TRIPS & BLOCKS CLOSING W/1122, 1122, 1122, 2026. TT SPP ACUA FRIA VIA P.L.C.
"R"	230KV W/1122 BUS FAIL	55F		TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 2026. TT SPP ACUA FRIA VIA P.L.C.
"T"	230KV W/1127 BUS FAIL	65F		TRIPS & BLOCKS CLOSING W/1122, 1122. TT SPP DEER VALLEY VIA P.L.C. TT RACEWAY VIA P.L.C.
"U"	230KV W/1122 BUS FAIL	65F		TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 1726. TT SPP DEER VALLEY VIA P.L.C.
"V"	230KV W/1122 BUS FAIL	65F		TRIPS & BLOCKS CLOSING W/1122, 422, 1126, 1122, 1122, 1726, 2026. TT RACEWAY VIA P.L.C.

RELAY NUMBER	RELAY DEFINITION	RELAY NUMBER	RELAY DEFINITION
21	PHASE DISTANCE GROUND DISTANCE	91	NON-DIR. TIME OVERCURRENT
25	SYNCH CHECK	99	OVERVOLTAGE
27	UNDERVOLTAGE DIR. POLE	60	12.5 SEC. CONTROL
32	NON-DIR. INST. OVERCURE W/TIME END OVERCURE	63	FAULT PREVENTION
304	NON-DIR. INST. OVERCURE W/TIME END OVERCURE	67C	DIR. END OVERCURE
310	NON-DIR. INST. OVERCURE W/TIME END OVERCURE	75	RELOADING
50	NON-DIR. INST. OVERCURE W/TIME END OVERCURE	81	UNDER FREQUENCY
50P	INST. OVERCURE W/TIME END OVERCURE	87	DITP. PROTECTIVE

RELAY	RELAY NUMBER
1-REL-11	21
1-REL-12	21
1-MR-10	21
1-K21	21
1-REL-11C	21-11C-478-SWP-10
1-CYCL-12	25
1-MR	30
1-REL-11C-SWP	30P
1-TRC-12	57C
1-T11	63
1-HEA-LOR-R	64
1-LFC	67

WESTWING 230KV SWITCHYARD BAYS 10-18 ONE LINE DIAGRAM

FILE - FIELD & STATION
DRAFTSMAN & ENGINEER
CHANGES AND REVISIONS
ACTIVE USE
DATE
MODIFICATION
REVISIONS
BY DATE
CHECKED BY DATE
DATE

DATE: 8-28-77
DRAWING NO. G-33301
SHEET 1 OF 2

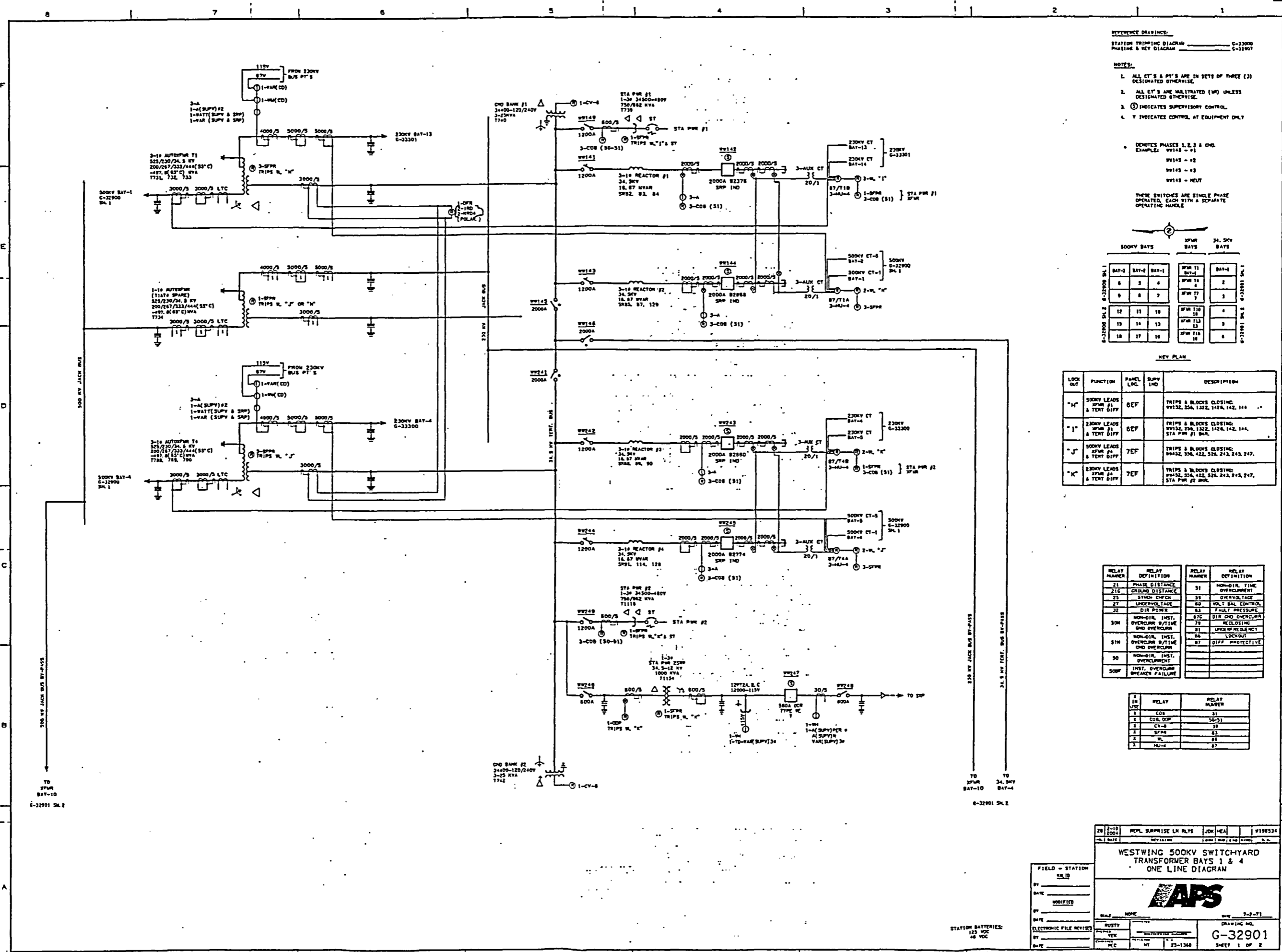
APPS

BY: MEC MARCO TAYLOR
DATE: 8-28-77
REV: 25-1370

CONTINUED ON G-33301, SHEET 2

CONTINUED ON G-33300

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REFERENCE DRAWINGS:
 STATION PRIMING DIAGRAM G-32000
 PHASING & KEY DIAGRAM G-32007

- NOTES:
- ALL CT'S & PT'S ARE IN SETS OF THREE (3) DESIGNATED OTHERWISE.
 - ALL CT'S ARE METERED (M) UNLESS DESIGNATED OTHERWISE.
 - (S) INDICATES SUPERVISORY CONTROL.
 - (Y) INDICATES CONTROL AT EQUIPMENT ONLY.

• DENOTES PHASES 1, 2, 3 & CND.
 EXAMPLE: SW145 - 01
 SW145 - 02
 SW145 - 03
 SW145 - NCVT

THESE SWITCHES ARE SINGLE PHASE OPERATED, EACH WITH A SEPARATE OPERATING HANDLE.

KEY PLAN

500KV BAYS			34.5KV BAYS	
BAY-2	BAY-3	BAY-4	34.5KV BAY-1	34.5KV BAY-2
1	2	3	4	5
4	5	6	7	8
7	8	9	10	11
10	11	12	13	14
13	14	15	16	17
16	17	18	19	20

LOCK OUT	FUNCTION	PANEL LOC.	SUPPLY	DESCRIPTION
"H"	500KV LEADS 3PWR #1 & TEST DIFF	6EF		TRIPS & BLOCKS CLOSING: SW132, 234, 1322, 1428, 142, 144
"I"	230KV LEADS 3PWR #1 & TEST DIFF	6EF		TRIPS & BLOCKS CLOSING: SW132, 204, 1322, 1428, 142, 144, STA PWR #1 BUS
"J"	500KV LEADS 3PWR #2 & TEST DIFF	7EF		TRIPS & BLOCKS CLOSING: SW432, 234, 422, 524, 242, 242, 247
"K"	230KV LEADS 3PWR #2 & TEST DIFF	7EF		TRIPS & BLOCKS CLOSING: SW432, 204, 422, 524, 242, 242, 247, STA PWR #2 BUS

RELAY NUMBER	RELAY DEFINITION	RELAY NUMBER	RELAY DEFINITION
21	PHASE DISTANCE	51	NON-DIR. TIME OVERCURRENT
21C	GROUND DISTANCE	51	OVERVOLTAGE
22	STUCK CIRC. CIR.	80	VOLT. BAL. CONTROL
27	UNDERVOLTAGE	83	FAULT PRESSURE
32	DIR. POWER	87C	DIR. CND. OVERCLAMP
50M	NON-DIR. INST. OVERCLAMP R/TIME CND. OVERCLAMP	87D	DIR. CND. OVERCLAMP
51H	NON-DIR. INST. OVERCLAMP R/TIME CND. OVERCLAMP	87E	LOCKOUT
50	NON-DIR. INST. OVERCLAMP	87	DIFF. PROTECTIVE
50P	INST. OVERCLAMP BREAKER FAILURE		

J	RELAY	RELAY NUMBER
1	CB	51
2	CB, DOP	50-51
3	CT-4	37
4	SPFR	63
5	WL	85
6	WL-4	87

28 2-10 2004 REPL. SURPRISE LR RLYS JOK-HEA W198334

WESTWING 500KV SWITCHYARD TRANSFORMER BAYS 1 & 4 ONE LINE DIAGRAM

APS

FIELD - STATION VAL 19

DATE: _____

BY: _____

DATE: _____

BY: _____

DATE: _____

BY: _____

DATE: _____

STATION BATTERIES: 125 VDC 48 VDC

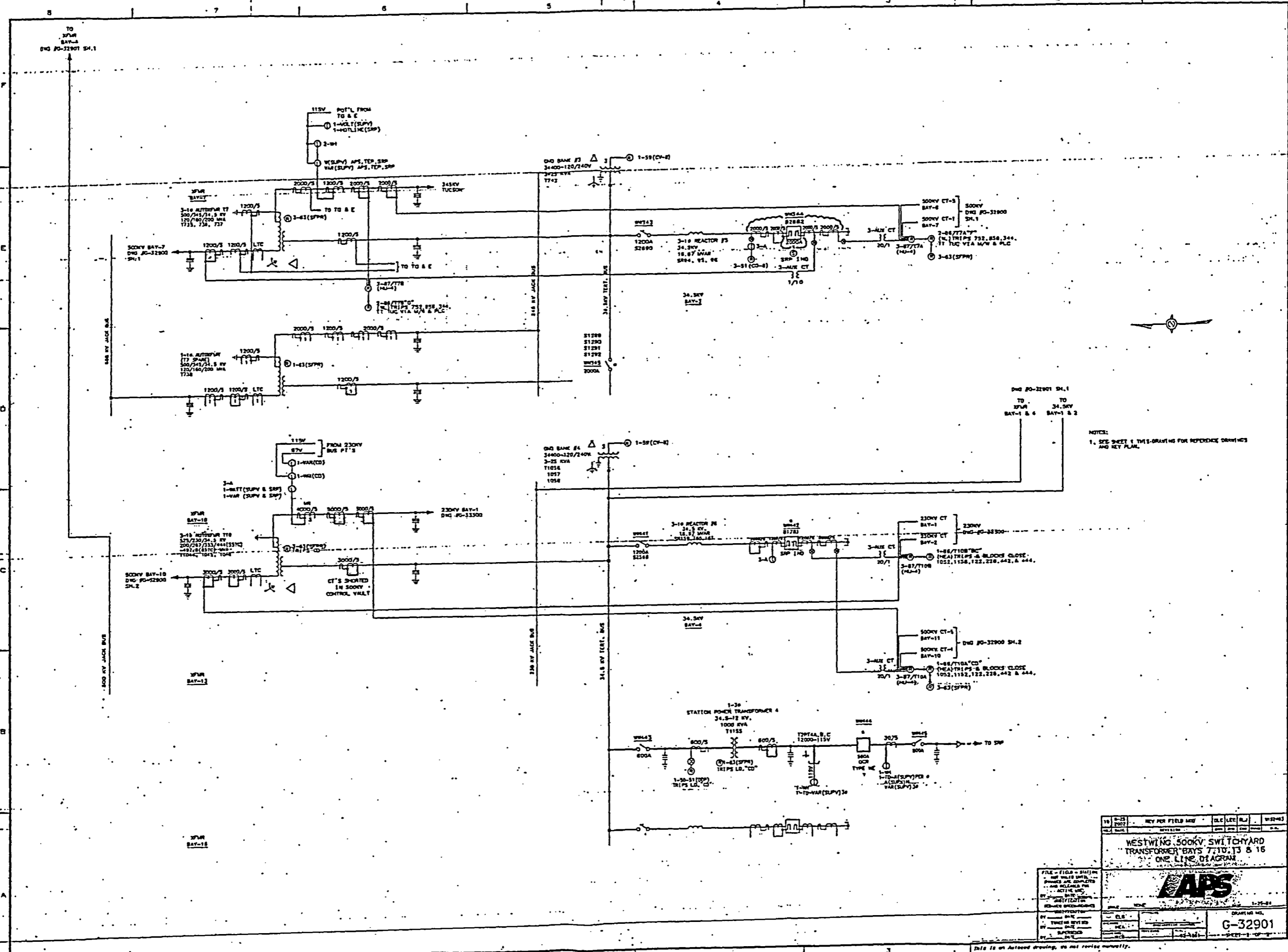
SCALE: NONE

DATE: 7-2-71

DRAWING NO. G-32901

SHEET 1 OF 2

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NOTES:
1. SEE SHEET 1 THIS DRAWING FOR REFERENCE DRAWINGS AND KEY PLAN.

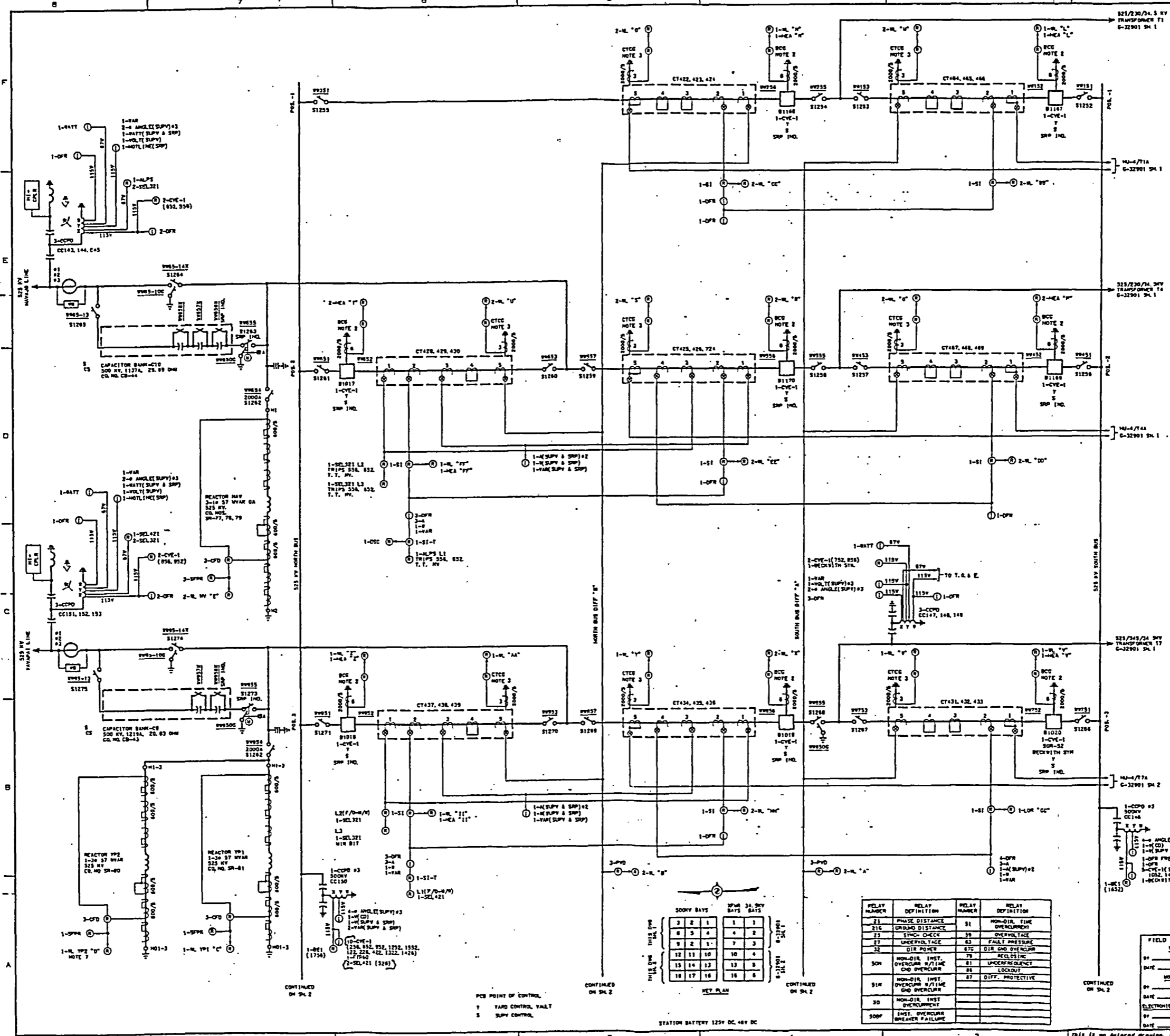
10	3-25	REV PER FIELD REV	ELC	LET	RLJ	WER-MS
01	0001					
WESTING. 500KV SWITCHYARD TRANSFORMER BAYS 7, 10, 13 & 14 ONE LINE DIAGRAM						



FILE - FIELD - STATION
- ALL WIRE SIZES,
- POINTS AND SPACINGS
- AND RELAYS FOR
- ACTIVE USE
BY
DATE
REVISIONS SPECIFICATIONS
BY
DATE
BY
DATE

DRAWING NO.
G-32901
SHEET 1 OF 2

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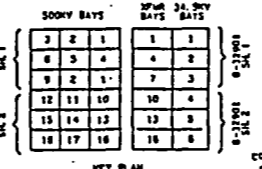


REFERENCE DWGS:
PHASING & KEY DIAGRAM 6-32902

NOTES:
1. ALL C.T.'S ARE 3000/5 UNLESS OTHERWISE NOTED
2. BCS 1-SC (3 UNIT) PER POSITION.
3. CTCB 1-SC (3 UNIT) PER POSITION.
4. ALL PCB'S RATED 3000A CONTINUOUS.
5. ALL DISC'S RATED 3000A UNLESS OTHERWISE NOTED.
6. TRIPPER TRIP INCLUDES LTT & B AND GTT.
7. DISABLE "O" WHEN THE REACTOR IS SPARK ON OR HAZARD LINE.

LOCK OUT	FUNCTION	PANEL SUPPLY LOC.	DESCRIPTION
"A"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 452, 752, 1052, 1454, 1852.
"B"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W256, 852, 952, 1252, 1552, 1754.
"C"	REACTOR DIFF	20P	TRIPS & BLOCKS CLOSING: W456, 952, T.T. TP.
"D"	REACTOR DIFF	20P	TRIPS & BLOCKS CLOSING: W456, 952, T.T. TP. (SEE NOTE 7)
"E"	REACTOR DIFF	20P	TRIPS & BLOCKS CLOSING: W456, 952, T.T. TP. (SEE NOTE 8)
"L"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"M"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"N"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"O"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"P"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"Q"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"R"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"S"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"T"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"U"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"V"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"W"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"X"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"Y"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"Z"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"AA"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"BB"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"CC"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"DD"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"EE"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"FF"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"GG"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"HH"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.
"II"	500KV BUS DIFF	10P	TRIPS & BLOCKS CLOSING: W152, 256, 452, 752, 1052, 1454, 1852, 1252, 1426.

RELAY	RELAY NUMBER
ALPS	21-21C-47C-300P
SEL321	21-21C-47C-300P
SEL421	21-21C-47C-300P
CVE-1/AB1	15
BECAWTH BTH	25
SC	30
ST/SP-1/AB1	30P
SI-1	31
SPPB	63
SG33	79
HEA/M/AB	86
PVD/CPD	87



RELAY NUMBER	RELAY DEFINITION	RELAY NUMBER	RELAY DEFINITION
21	PHASE DISTANCE	81	NON-OIL TIME OVERCURRENT
21G	GROUND DISTANCE	82	OVERVOLTAGE
22	SYNCH CHECK	83	UNDERVOLTAGE
27	UNDERVOLTAGE	84	DIR. POWER
32	DIR. POWER	85	RECLOSING
50N	NON-OIL INST. OVERCURRENT W/TIME CD OVERCLUR	86	UNDERFREQUENCY
50H	NON-OIL INST. OVERCURRENT W/TIME CD OVERCLUR	87	DIFF. PROTECTIVE
50P	NON-OIL INST. OVERCURRENT		
500P	INST. OVERCURRENT BREAKER FAILURE		

WESTWING 500KV SWITCHYARD BAYS 1-9 ONE LINE DIAGRAM

APS

FIELD - STATION
 BY: []
 DATE: []
 MODIFIED: []
 DATE: []
 ELECTRONIC FILE REVISION: []
 DATE: []

SCALE: NONE
 JUSTY: []
 DATE: []
 DATE: []

9199334
 23-1-27
 2004
 REPL SUPPLIES LN RLYS
 JON HEA
 9199334

DATE: 4-22-71
 DRAWING NO. G-32900
 SHEET 1 OF 2

