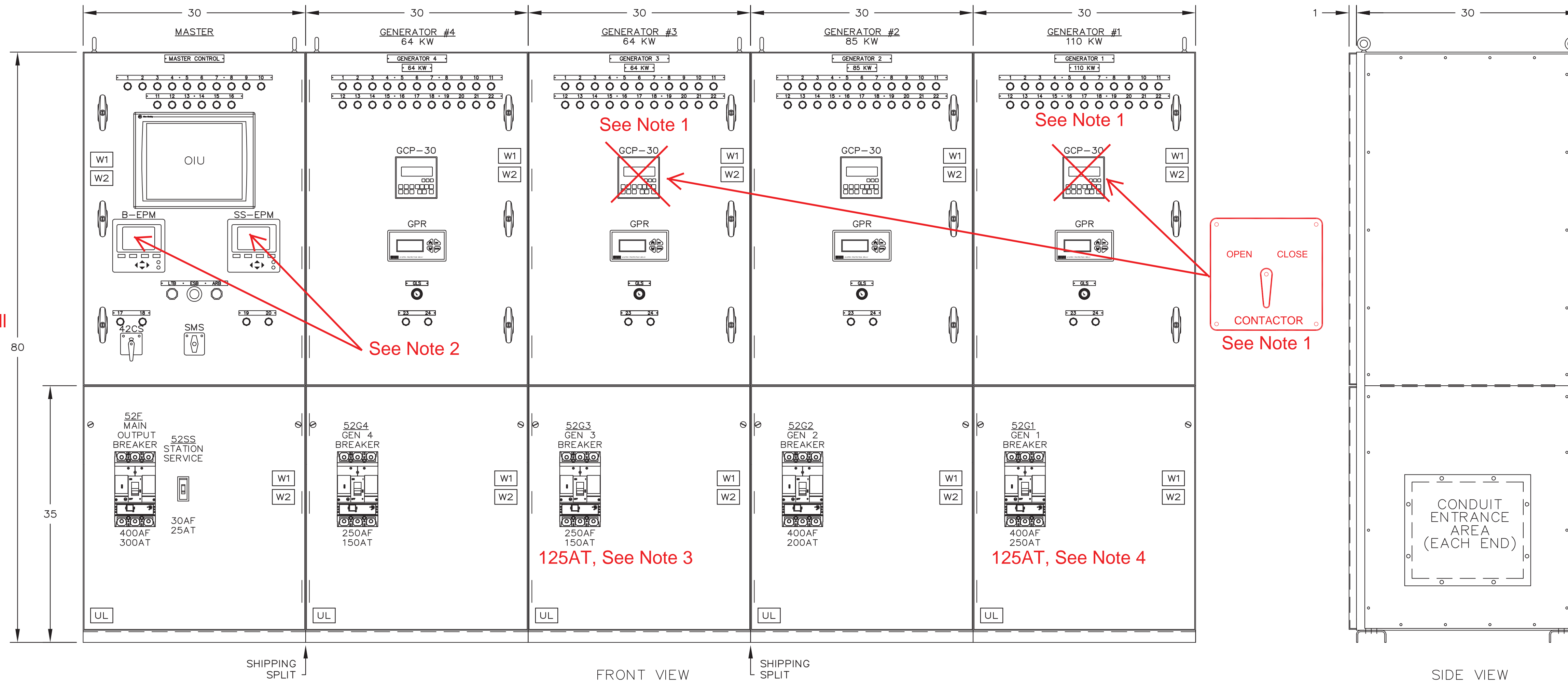


Switchgear Modification Specific Notes:

- 1) Remove existing GCP and install cover plate with face mounted Contactor Close / Contactor Open switch and back mounted Lock Out Relay. See Sheets 4A, 4C, 6A, and 6C for connection to existing.
- 2) Remove existing Bus and Station Service meters and install new meters. See Sheet 5.
- 3) Remove existing Gen #3 trip plug and install new 125A trip plug. See Sheet 4C.
- 4) Remove existing Gen #1 trip plug and install new 125A trip plug. See Sheet 4A.



DEVICE LEGEND	
ARB	ALARM RESET BUTTON
B-EPM	BUS ELECTRONIC POWER METER - 7650ION
ESB	EMERGENCY STOP BUTTON
GCP	GENERATOR CONTROL PACKAGE
GLS	GENERATOR LOCKOUT SWITCH
GPR	GENERATOR PROTECTIVE RELAY
OIU	OPERATOR INTERFACE UNIT
LTB	LAMP TEST BUTTON
SMS	MASTER CONTROL SWITCH (AUTO-MANUAL)
SS-EPM	STATION SERVICE POWER METER - 7550ION
42xx	CONTACTOR
42CS	CONTACTOR CONTROL SWITCH
52xx	CIRCUIT BREAKER

GENERATOR ANNUNCIATOR LEGEND:			
1	ENGINE RUN	13	NOT IN AUTO POSITION
2	ENGINE IDLE	14	GENERATOR BREAKER OPEN
3	ENGINE ALARM	15	FAIL TO SYNCHRONIZE
4	LOW OIL PRESSURE	16	OVERCURRENT
5	LOW OIL LEVEL	17	UNDER VOLTAGE
6	HIGH OIL TEMPERATURE	18	OVER VOLTAGE
7	HIGH WATER TEMPERATURE	19	UNDER FREQUENCY
8	OVERSPEED	20	OVER FREQUENCY
9	OVERCRANK	21	LOSS OF EXCITATION
10	COOLDOWN/LOCKOUT	22	REVERSE POWER
11	BATTERY CHARGER FAILURE	23	CONTACTOR OPEN
12	NORMAL STOP	24	CONTACTOR CLOSED

MASTER ANNUNCIATOR LEGEND:			
1	FIRE ALARM LIGHT	11	HEAT RECOVERY NO LOAD
2	EMERGENCY STOP LIGHT	12	HEAT RECOVERY LOSS OF PRESSURE
3	SYSTEM LOW WATER LEVEL LIGHT	13	HEAT RECOVERY LOSS OF FLOW
4	LOW FUEL LEVEL LIGHT	14	SPARE 1
5	BUS UNDER/OVER VOLTAGE LIGHT	15	SPARE 2
6	BUS UNDER/OVER FREQUENCY LIGHT	16	SPARE 3
7	FEEDER BREAKER OVERCURRENT LIGHT	17	FEEDER BREAKER OPEN
8	PRIMARY PLC FAILURE	18	FEEDER BREAKER CLOSED
9	OPERATING ON BACKUP PLC	19	STATION SERVICE BREAKER OPEN
10	BACKUP PLC FAILURE	20	STATION SERVICE BREAKER CLOSED

DRAWING LEGEND	
1	PHYSICAL LAYOUT
2	SINGLE LINE DIAGRAM
3	BLANK
4A	GENERATOR 1 AC SCHEMATIC
4B	GENERATOR 2 AC SCHEMATIC
4C	GENERATOR 3 AC SCHEMATIC
4D	GENERATOR 4 AC SCHEMATIC
5	MASTER AC & DISTRIBUTION SCHEMATIC
6A	GENERATOR 1 DC CONTROL SCHEMATIC
6B	GENERATOR 2 DC CONTROL SCHEMATIC
6C	GENERATOR 3 DC CONTROL SCHEMATIC
6D	GENERATOR 4 DC CONTROL SCHEMATIC
7A	GENERATOR 1 DC CONTROL SCHEMATIC
7B	GENERATOR 2 DC CONTROL SCHEMATIC
7C	GENERATOR 3 DC CONTROL SCHEMATIC
7D	GENERATOR 4 DC CONTROL SCHEMATIC
8A	GENERATOR 1 DC CONTROL SCHEMATIC
8B	GENERATOR 2 DC CONTROL SCHEMATIC
8C	GENERATOR 3 DC CONTROL SCHEMATIC
8D	GENERATOR 4 DC CONTROL SCHEMATIC

DRAWING LEGEND	
9	MASTER DC CONTROL SCHEMATIC
10	MASTER DC CONTROL SCHEMATIC
11	MASTER DC CONTROL SCHEMATIC
12	BLANK
13	BLANK
14	PLC COMMUNICATION DIAGRAM
15	COMMUNICATION NETWORK DIAGRAM
16	EPM MONITORING & SYSTEM COMMUNICATION DIAGRAM
17	HEATER & LIGHTING CONTROL SCHEMATIC
18	CONTROL SWITCH TARGET DIAGRAM
19	NAMEPLATE DETAILS
20	INTERCONNECTION DIAGRAM

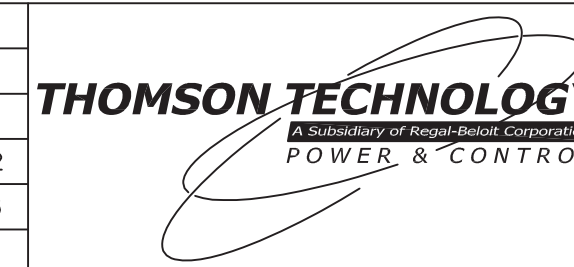
Switchgear Modification General Notes:

- A) The existing switchgear is not functioning due to age and neglect. The purpose of the M&I project switchgear modifications is to restore limited function to allow operation of Gen #1 and Gen #3 sections. A more extensive upgrade is scheduled in the near future under a separate project.
- B) The new generators operating in positions #1 and #3 are equipped with unit mounted control panels. All start/stop, speed control, and unit protection will be performed from the control panels and not from the switchgear.
- C) The new generators operating in positions #1 and #3 are 24VDC and the associated starter batteries will provide 24VDC power to the switchgear. The failed 12-24VDC converters will be taken out of service.
- D) The existing generators in positions #2 and #4 will be locked out of service.
- E) The switchgear will temporarily serve as a manual transfer switch allowing operation of Gen #1 or Gen #3 individually. The new controls will allow either generator to close into a dead bus and will prevent the two generators from operating simultaneously.

REFER TO SHEET #

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DRAWING No.	REFERENCE DRAWINGS	No.	REVISIONS	BY	AUTH	DATE
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1	APPROVAL MOD'S			BM	RH	05-03-16

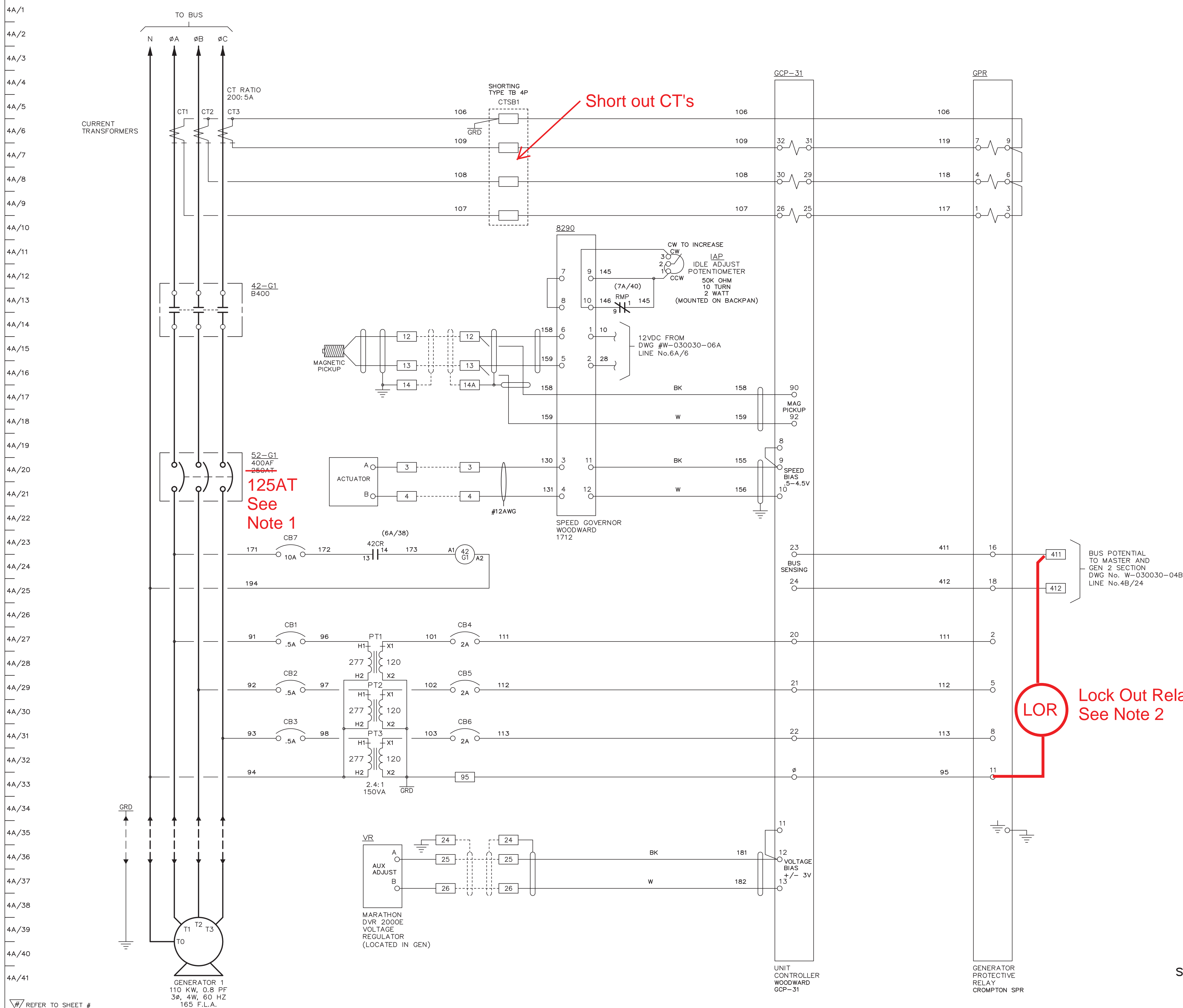


GENERATOR CONTROL PANEL
 MODEL GCS 2200
 PHYSICAL LAYOUT
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

AS BUILT

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CUSTOMER ALASKA ENERGY AUTHORITY	
CUSTOMER ORDER No. C-022623	WORK ORDER No. W-030030
DRAWN BY LR	AUTH BY RH
DATE 05-02-14	REV 2
DRAWING/FILE No. W-030030-01	SHEET 1



Notes:
 1) Existing Gen #1 breaker is a G.E. Spectra RMS Cat. # SGHA36AT0400. Remove existing trip plug and install new 125A trip plug.
 2) Furnish and install new Lock Out Relay to prevent closing contactor when bus is hot. Min 2 pole relay with 120VAC coil.

125AT
See Note 1

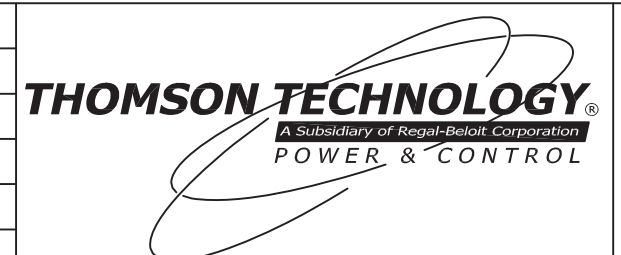
LOR
Lock Out Relay
See Note 2

SECTION #5

AS BUILT

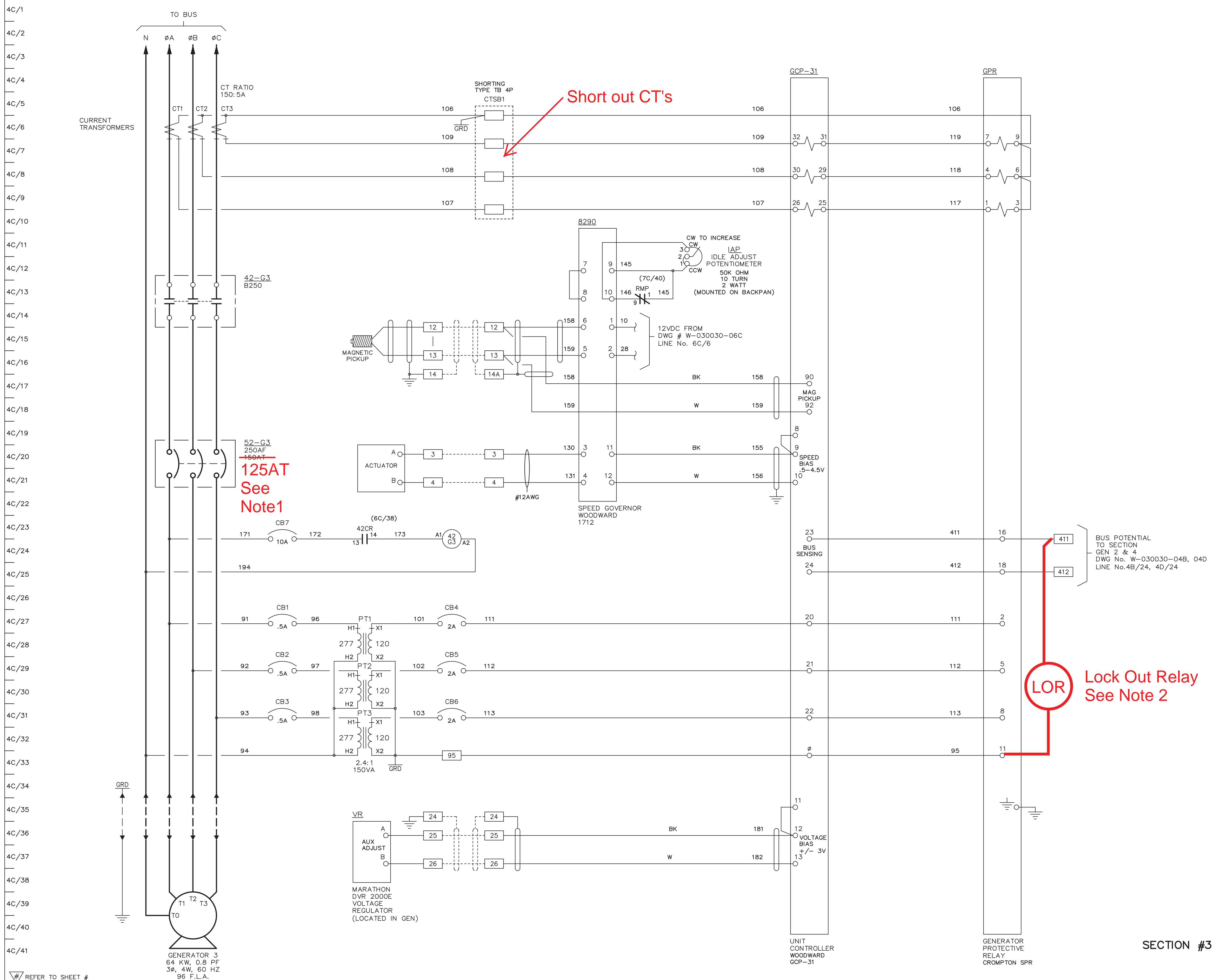
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GENERATOR CONTROL PANEL
 MODEL GCS 2200
 GENERATOR #1 AC SCHEMATIC
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

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CUSTOMER ALASKA ENERGY AUTHORITY		WORK ORDER No. W-030030	
CUSTOMER ORDER No. C-022623	AUTH BY RH	DATE 05-02-14	REV 1
DRAWN BY LR	DRAWING/FILE No. W-030030-04A		SHEET 4A



Notes:
 1) Existing Gen #3 breaker is a G.E. Spectra RMS Cat. # SFHA36AT0250. Remove existing trip plug and install new 125A trip plug.
 2) Furnish and install new Lock Out Relay to prevent closing contactor when bus is hot. Min 2 pole relay with 120VAC coil.

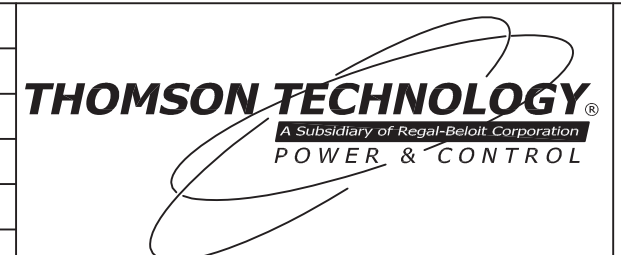
LOR Lock Out Relay
See Note 2

SECTION #3

AS BUILT

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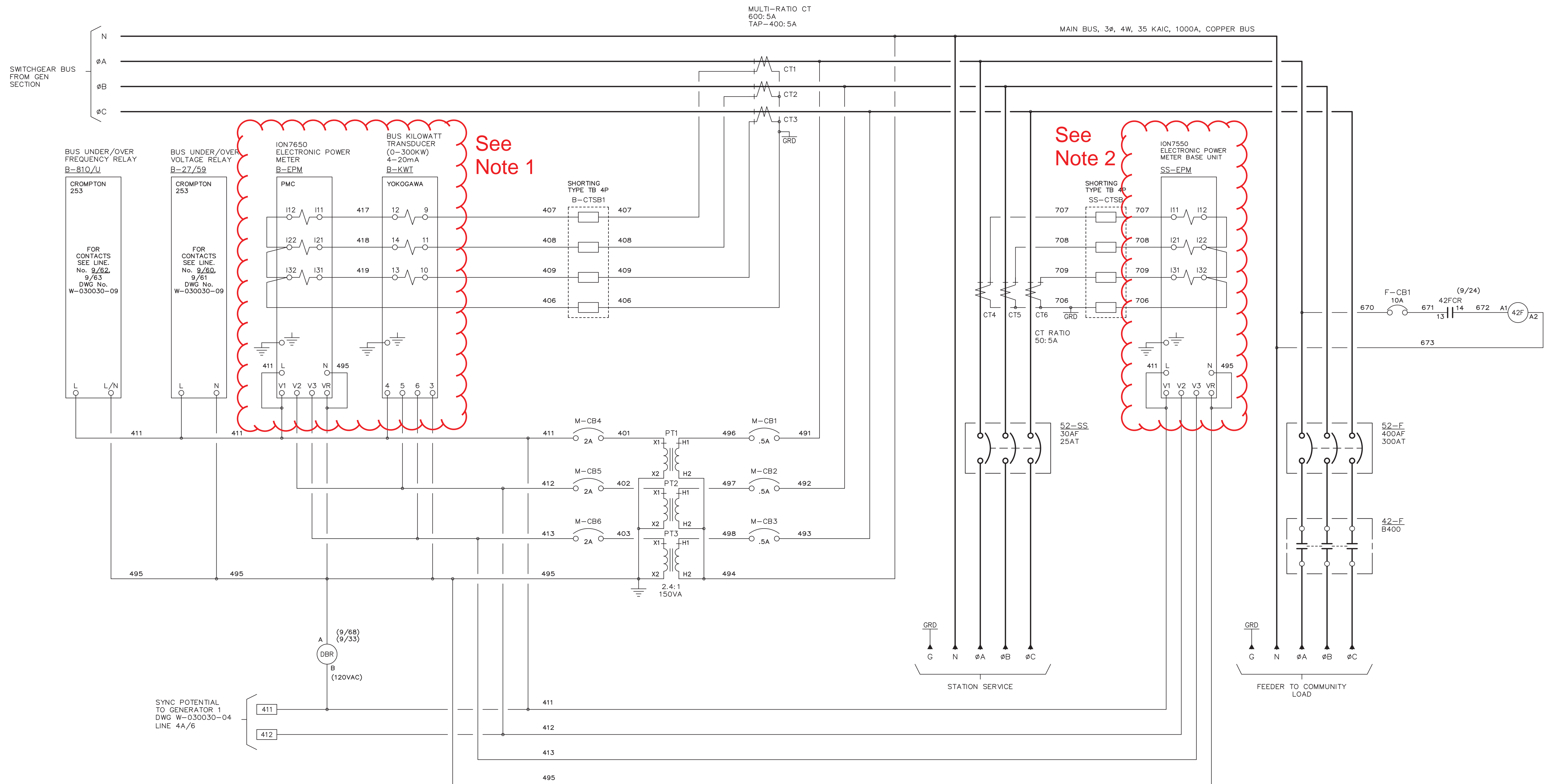
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1	AS BUILT			BM	RH	05-05-02



GENERATOR CONTROL PANEL
 MODEL GCS 2200
 GENERATOR #3 AC SCHEMATIC
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

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CUSTOMER ALASKA ENERGY AUTHORITY		WORK ORDER No. W-030030	
CUSTOMER ORDER No. C-022623	AUTH BY RH	DATE 05-02-14	REV 1
DRAWN BY LR	DRAWING/FILE No. W-030030-04C		SHEET 4C

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See Note 1

See Note 2

Notes:

- 1) Remove existing Totalizing (Bus) Meter and provide new meter: Class 10 current inputs, 120V AC input, 18-60V DC power supply. Provide with 4-20 mA I/O card, Ethernet communications port, panel mount remote display module, and cable. SHARK 200-60-10-V2-D-INP100S-20mAOS, or approved equal.
- 2) Remove existing Station Service Meter and provide new meter: Class 10 current inputs, 120V AC input, 18-60V DC power supply. Provide with 4-20 mA I/O card, Ethernet communications port, panel mount remote display module, and cable. SHARK 200-60-10-V2-D-INP100S-X, or approved equal.

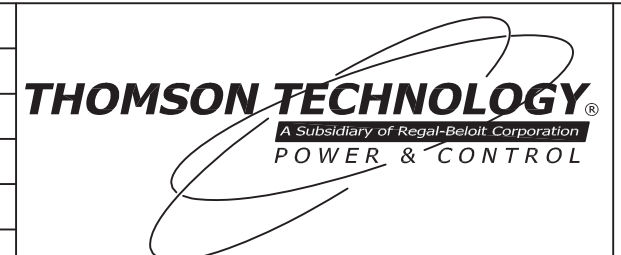
SECTION #1

AS BUILT

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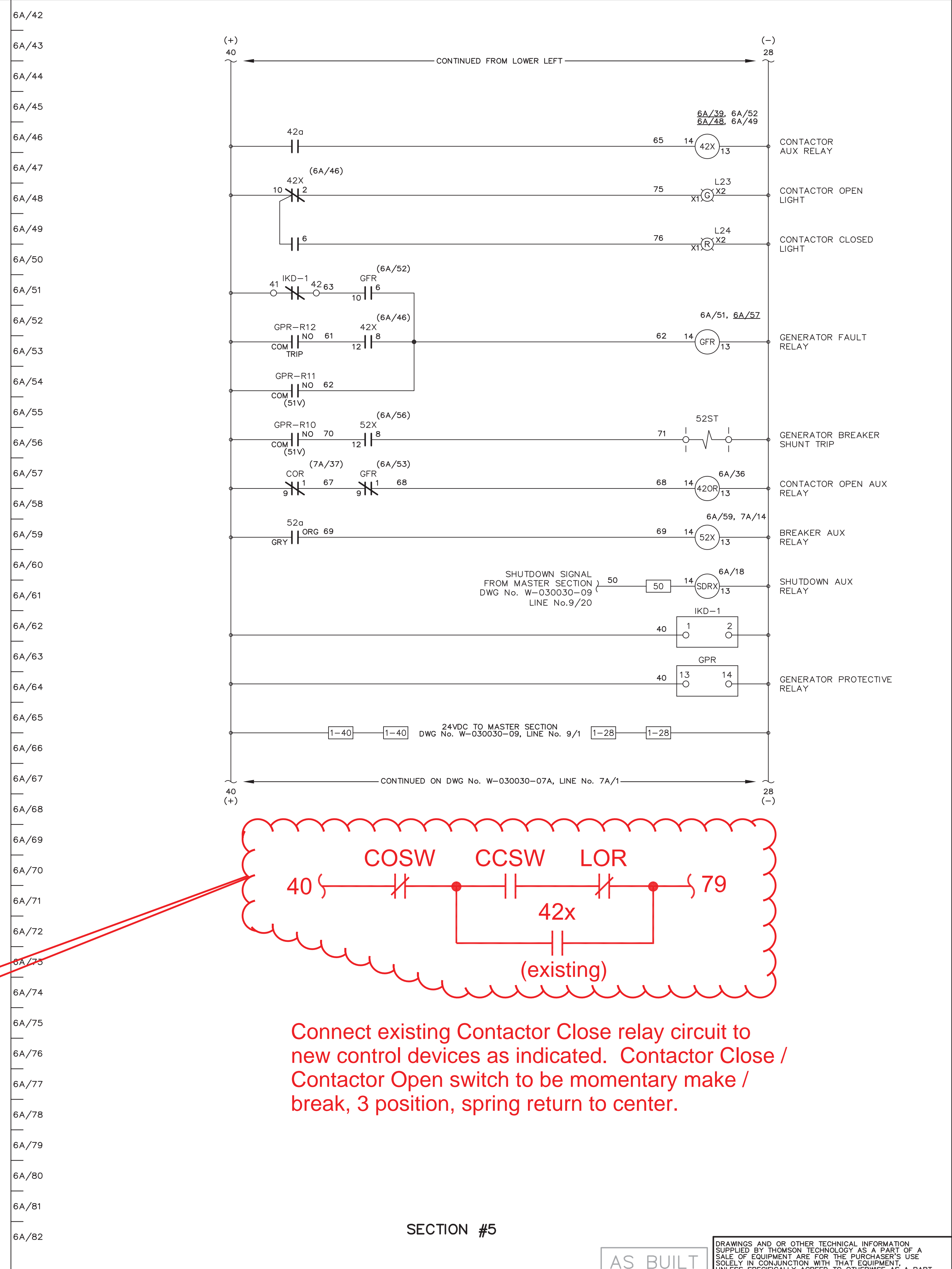
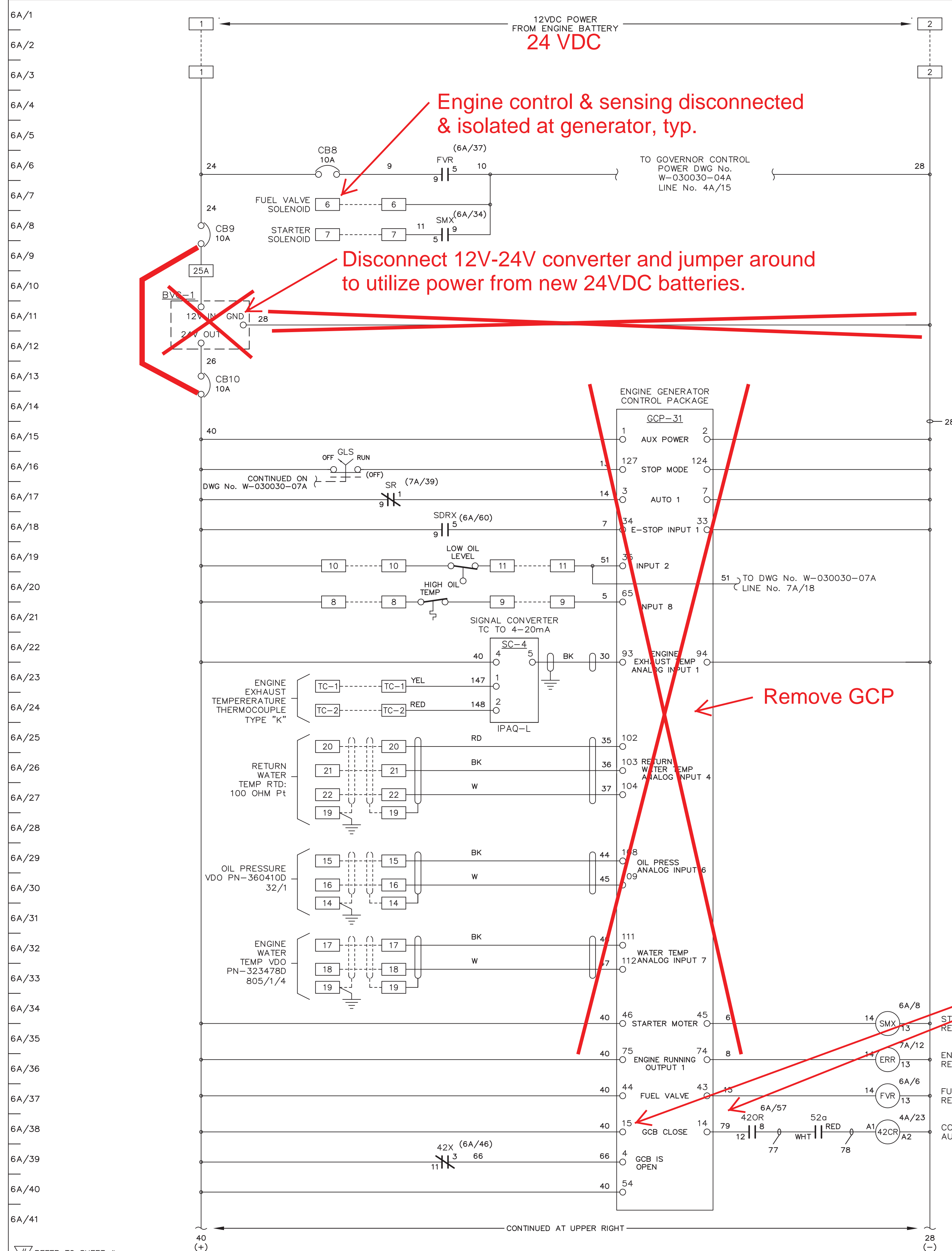
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1	AS BUILT			BM	RH	05-05-02



GENERATOR CONTROL PANEL
 MODEL GCS 2200
 MASTER AC & DISTRIBUTION SCHEMATIC
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

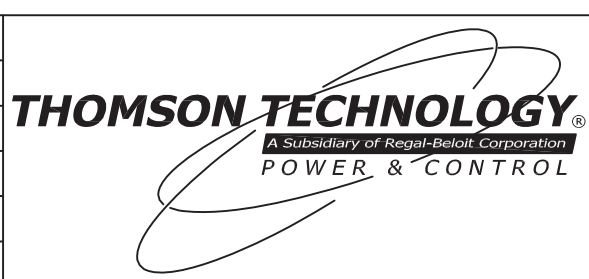
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DRAWING/FILE No. W-030030-05			SHEET 5



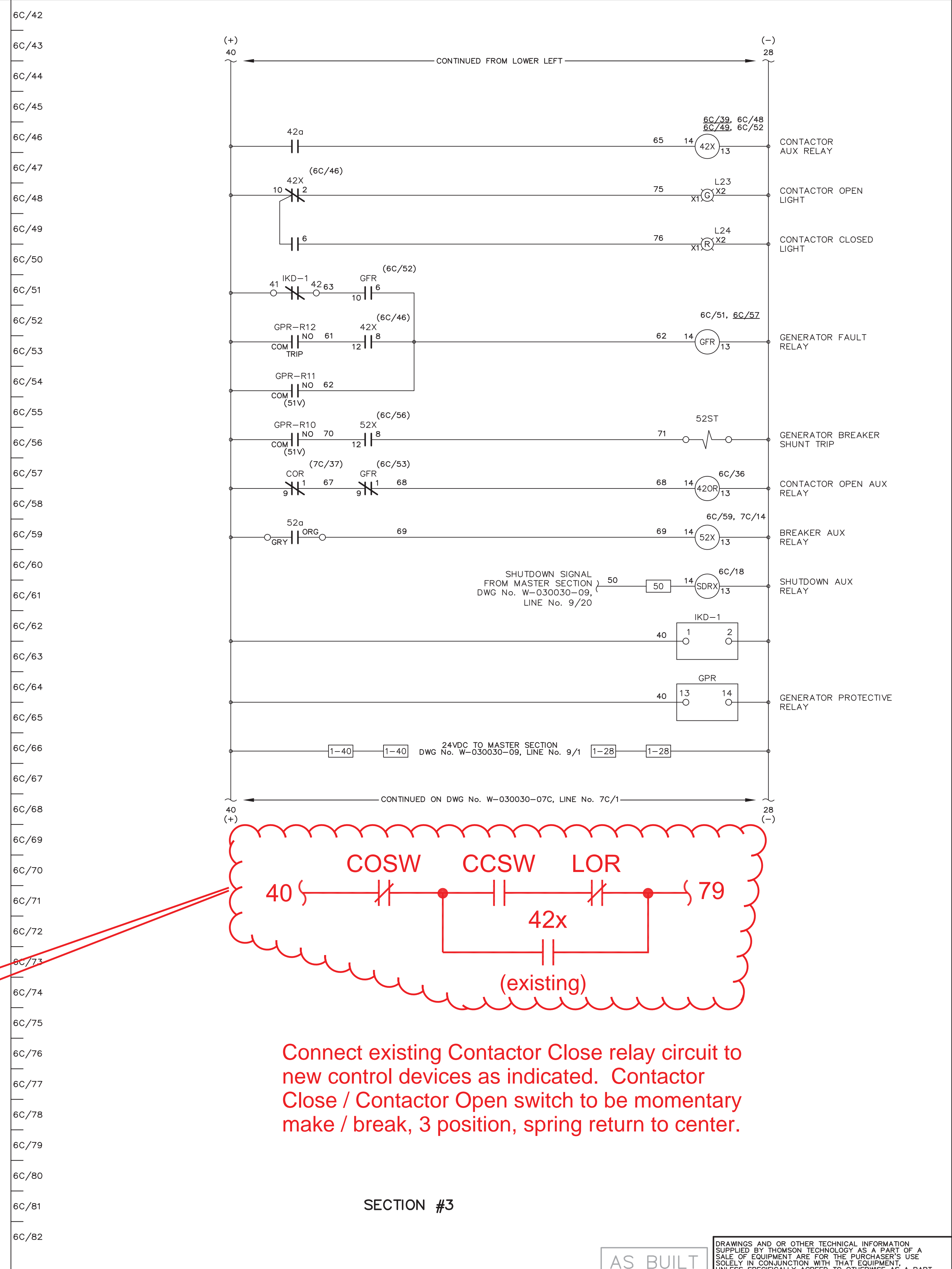
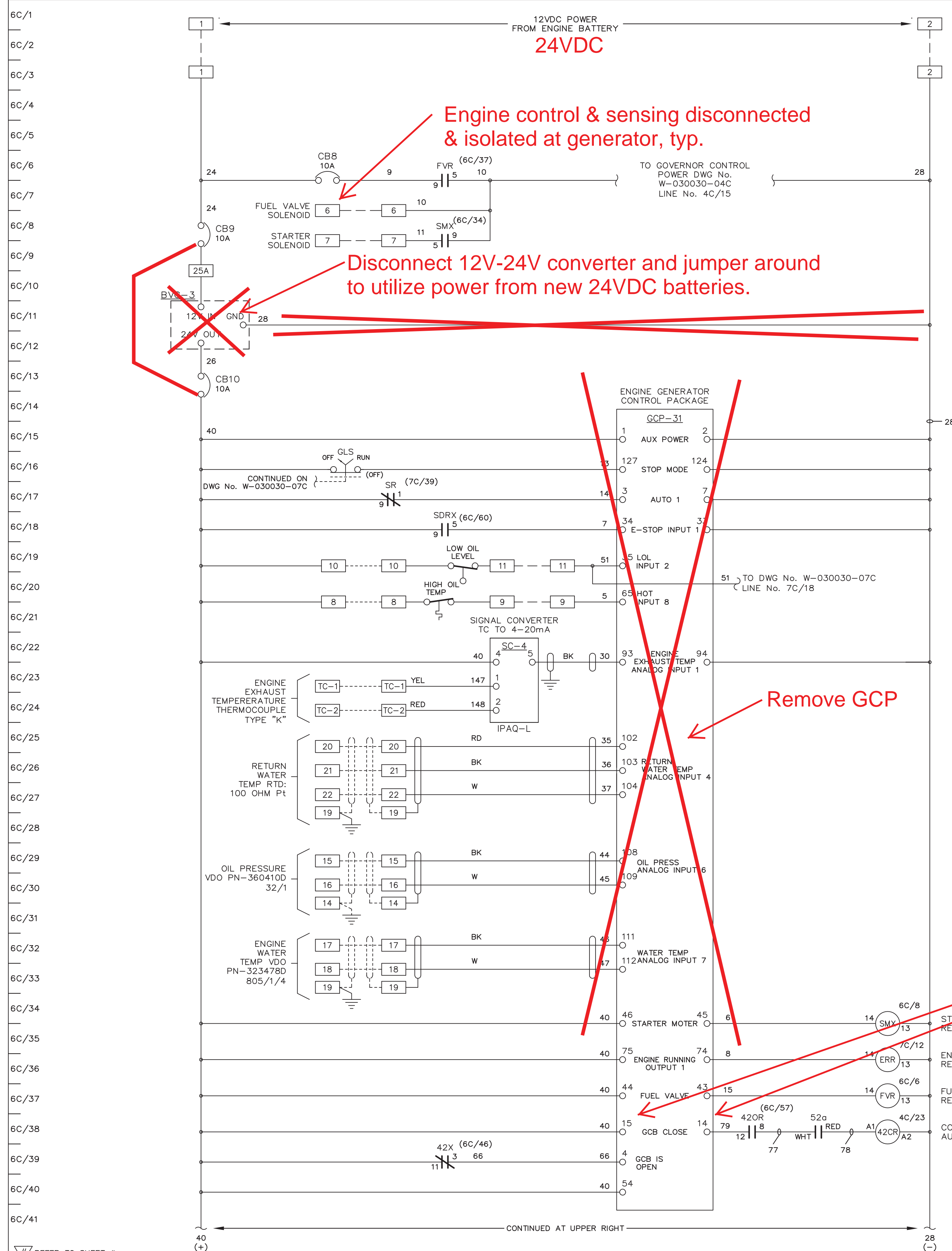
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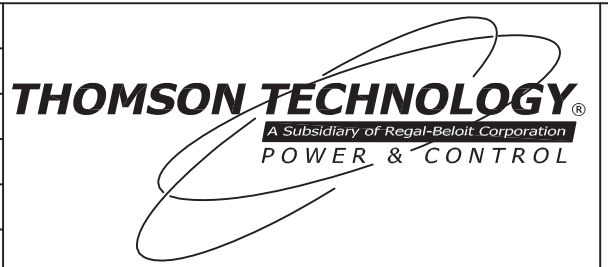
SECTION #5
AS BUILT
 GENERATOR CONTROL PANEL
 MODEL GCS 2200
 GENERATOR 1 DC CONTROL SCHEMATIC
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

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CUSTOMER ALASKA ENERGY AUTHORITY			
CUSTOMER ORDER No. C- 022623	WORK ORDER No. W- 030030		
DRAWN BY LR	AUTH BY RH	DATE 05-02-14	REV 1
DRAWING/FILE No. W-030030-06A			SHEET 6A



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2	AS BUILT			BM	RH	05-05-02
1	APPROVAL MOD'S			BM	RH	05-03-16



GENERATOR CONTROL PANEL
 MODEL GCS 2200
 GENERATOR 3 DC CONTROL SCHEMATIC
 MIDDLE KUSKOKWIM REGIONAL ENERGY - SLEETMUTE

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CUSTOMER ALASKA ENERGY AUTHORITY		WORK ORDER No. W-030030	
CUSTOMER ORDER No. C- 022623	DRAWN BY LR	AUTH BY RH	DATE 05-02-14
			REV 2
DRAWING/FILE No. W-030030-06C	SHEET 6C		