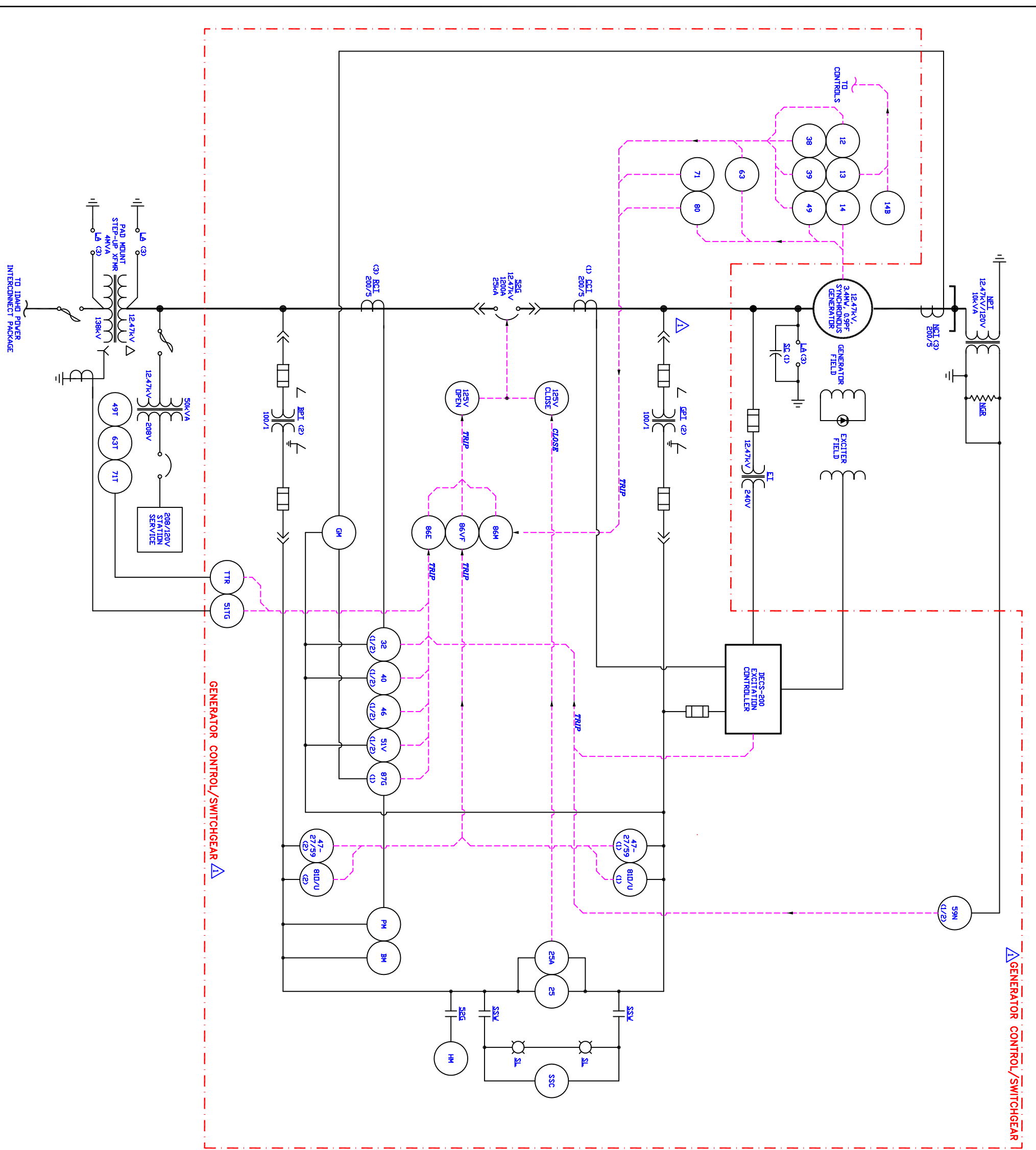


APPENDIX I – SINGLE LINE ELECTRICAL DIAGRAM



△ GENERATOR CONTROL/SWITCHGEAR

△ GENERATOR CONTROL/SWITCHGEAR

LINE LEGEND

- LINE
- - - CONTROL/SWGR CUBICLES
- - - EXCITATION CONTROL
- HIGH VOLTAGE
- REGULAR WIRING
- - - TRIP LINE

NOTES

△ SWITCHGEAR CONTROLS & VOLTAGE REGULATOR WIRED FOR A-B-C PHASE ROTATION.

ALL RELAY FUNCTIONS MARKED WITH (1), (2) OR (1/2) ARE PART OF (1) SR489 OR (2) M3410A MULTI FUNCTION RELAYS.

DEVICE LEGEND

12	OVERSPEED RELAY
13	SYNC SPEED RELAY
14	UNDERSPEED RELAY
14B	SECONDARY UNDERSPEED RELAY
25	SYNC CHECK RELAY
25A	AUTO SYNCHRONIZER
32	REVERSE POWER RELAY
38	BEARING OVER TEMPERATURE RELAY
39	OVER VIBRATION RELAY
40	LOSS OF EXCITATION RELAY
46	PHASE BALANCE RELAY
47-27/59	PHASE SEQ.-UNDER/OVER VOLTAGE RELAY
49	OVER TEMPERATURE RELAY
49T	TRANSFORMER OVER TEMPERATURE RELAY
51TG	TRANSFORMER GROUND OVER CURRENT RELAY
51V	OVERCURRENT W/VOLTI RESTRAINT RELAY
52G	GENERATOR CIRCUIT BREAKER
59N	NEUTRAL OVER VOLTAGE RELAY
63	COOLING WATER PRESSURE RELAY
63T	TRANSFORMER COOLING WATER PRESSURE RELAY
71	BEARING OIL LEVEL RELAY
71T	TRANSFORMER BEARING OIL LEVEL RELAY
80	COOLING WATER FLOW RELAY
80/2U	OVER/UNDER FREQUENCY RELAY
86E	ELECTRICAL LOCKOUT RELAY
86M	MECHANICAL LOCKOUT RELAY
86VF	VOLTI/REG LOCKOUT RELAY
87G	GENERATOR DIFFERENTIAL RELAY
87G	GENERATOR DIFFERENTIAL RELAY
BMT	BUS METER
BPT	BUS POTENTIAL TRANSFORMER
CCT	CROSS CURRENT TRANSFORMER
ET	EXCITATION TRANSFORMER
GM	GENERATOR METER
GPT	GENERATOR POTENTIAL TRANSFORMER
HM	HOUR METER
LA	LIGHTNING ARRESTOR
NCT	NEUTRAL CURRENT TRANSFORMER
NGR	NEUTRAL GROUND RESISTOR
NPT	NEUTRAL POTENTIAL TRANSFORMER
PCT	POWER METER
PM	RELAYING CURRENT TRANSFORMER
SC	SURGE CAPACITOR
SL	SYNC LIGHT
SSC	SYNC SCOPE
SSV	SYNC SWITCH
TTR	TRANSFORMER TRIP RELAY

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SORENSEN ENGINEERING
MASON DAM 3.4MW
HYDRO ELECTRIC PROJECT
ONE LINE DIAGRAM

DWG No.: 1300518-01
ENGR: DBATIDBF
DATE: 4-11-13