

NOTES

1. 115 kV. IVT RATIO

$$\frac{115,000}{\sqrt{3}} : \frac{115}{\sqrt{3}} // \frac{115}{\sqrt{3}} / \frac{115}{\sqrt{3}} \text{ V}$$
2. 115 kV. CT RATIO

$$1800/1500/1200/900/600/300 : 1/1/1/1 \text{ A. – FOR LINE BAY}$$
3. SYNCHRONIZING SCHEMATIC

3.1 0-Y-P-01 SHOWN THUS, REFER TO INCOMING IVT DESIGNATIONS.

3.2 0BYP-01 SHOWN THUS REFERS TO RUNNING BUS IVT

3.3 ØB ONLY ↙ SHOWN THUS, REFERS TO THE SECONDARY WINDING OF IVT FOR PHASE“B” AND USING FULL TAP WINDING 115V FOR SYNCHRONIZING SYSTEM WITH ONE END OF THE WINDING CONNECTED WITH COMMON GROUND BUS.

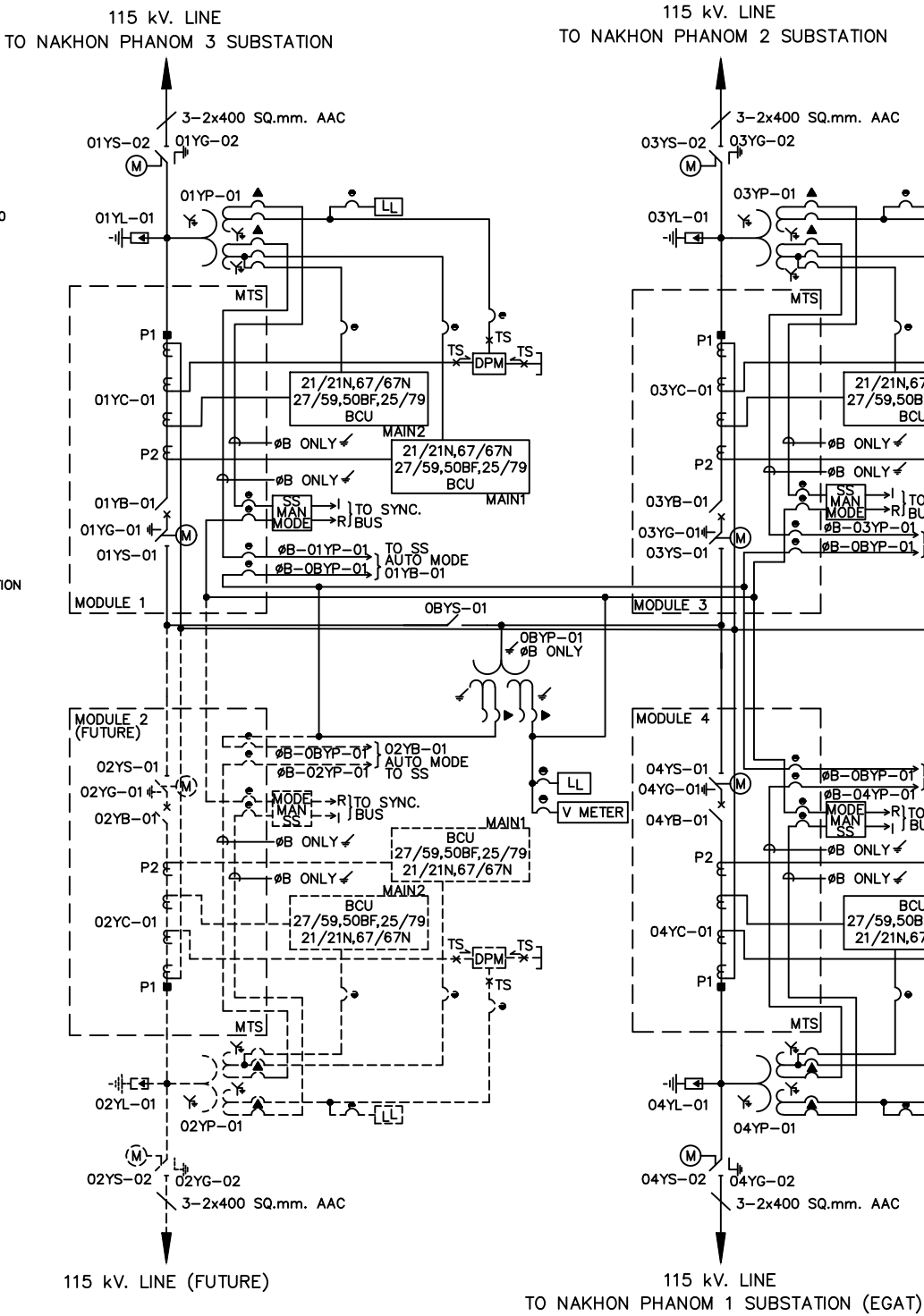
3.4 MANUAL SYNCHRONIZING BY SYNCHROSCOPE SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF METERING CORES FROM“PHASE B” FOR BOTH IVT’S.

3.5 AUTOMATIC SYNCHRONISM VERIFICATION BY SYNCHRO CHECK RELAY (25) SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF RELAYING CORES FROM“PHASE B” FOR BOTH IVT’S.
4. EACH DIGITAL POWER METER (DPM) SHALL BE COMMUNICATED WITH AUTOMATIC METER READING (AMR) APPLICATION SERVER VIA SWITCH NETWORK.

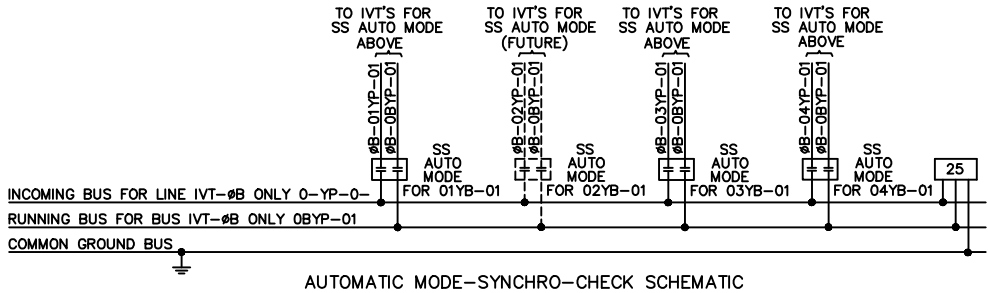
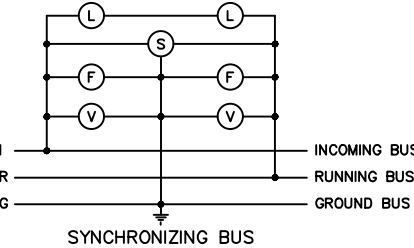
5. FOR 115KV RELAYS SHALL BE DOUBLE MAIN PROTECTION RELAY(MAIN1&2) AND DIFFERENT PRODUCT/MANUFACTURER.

6. A LINE CURRENT DIFFERENTIAL RELAY AND A REMOTE I/O MODULE OF CIRCUIT BREAKER FAILURE FUNCTION FOR INCOMING LINE SHALL BE USED WITH AN OPTICAL AND A REMOTE I/O MODULE OF CIRCUIT BREAKER FAILURE FIBRE CABLE AS A COMMUNICATION LINK AND SHALL BE DIRECTLY CONNECTED TO THE JOINT BOX (PROVED BY EGAT) AT EGAT SUBSTATION

7. NETWORK TOPOLOGY OF SUBSTATION CONTROL AND PROTECTION SYSTEM IS TOPOLOGY 1
- 50VA/0.2/1.5VF , 50VA/3P/1.5VF
(SIMULTANEOUS BURDEN = 100 VA.)
- 20VA/5P20 , 20VA/0.5FS5 , 20VA/5P20 , 20VA/5P20



DEVICES	EXPLANATION
21, 21N	DISTANCE TIME–STEP PHASE AND GROUND DISTANCE RELAY
67	DIRECTIONAL PHASE OVERCURRENT RELAY
67N	DIRECTIONAL GROUND OVERCURRENT RELAY
25	SYNCHROCHECK RELAY
79	AUTOMATIC RECLOSEING RELAY
50 BF	BREAKER FAILURE RELAY
50 51	NON–DIRECTIONAL INSTANTANEOUS AND TIME PHASE OVERCURRENT RELAY
50N 51N	NON–DIRECTIONAL INSTANTANEOUS AND TIME GROUND OVERCURRENT RELAY
51GB	NON–DIRECTIONAL GROUND BACKUP OVERCURRENT RELAY
87T	TRANSFORMER DIFFERENTIAL RELAY
87REF	TRANSFORMER RESTRICTED EARTH FAULT RELAY THIS RELAY SHALL BE INCORPORATED IN THE TRANSFORMER DIFFERENTIAL RELAY (87T)
87B	BUS DIFFERENTIAL RELAY, HIGH IMPEDANCE TYPE
95B	BUSBAR SUPERVISION RELAY FOR BUS WIRE SUPERVISION FOR 87B
27,59	UNDER/OVER VOLTAGE RELAY
90	AUTOMATIC VOLTAGE REGULATOR
50 ARC	ARC DETECTOR RELAY FOR ARC PROTECTION SYSTEM
81	UNDER FREQUENCY RELAY
60	CAPACITOR CURRENT UNBALANCE SENSING RELAY
Q	POWER FACTOR CONTROLLER
DPM	DIGITAL POWER METER
DIM	DISTRIBUTED I/O MODULE (PROVIDED IN CSCS)
V METER	DIGITAL VOLTMETER
SS	SYNCHRONIZING SWITCH,3–POSITION,AUTO–OFF–MAN
L	SYNCHRONIZING LAMP
V	VOLTMETER
F	FREQUENCY METER
S	SYNCHROSCOPE
LL	LINE INDICATING LAMP
TS	CURRENT TEST SWITCH
TS	POTENTIAL TEST SWITCH
▲	LOCATED IN THE SWITCHYARD JUNCTION BOX
●	LOCATED IN THE CONTROL AND RELAY BOARD
▼	LOCATED IN THE 22 kV SWITCHGEAR JUNCTION BOX
◇	FOR 22 kV SWITCHGEAR CONTROL & PROTECTIVE CIRCUITS
⌋	WYE CONNECTED CT OF SECONDARY WINDING
⌋	DELTA CONNECTED CT OF SECONDARY WINDING (IF ANY)
⌋	TRANSFORMER BUSHING CT OF SECONDARY WINDING, WYE CONNECTED FOR PHASE OR NEUTRAL
BCU	BAY CONTROL UNIT
87T	LINE CURRENT DIFFERENTIAL RELAY
REMOTE I/O	REMOTE INPUT/OUTPUT MODULE



MTS = MIXED TECHNOLOGY SWITCHGEAR

REFERENCE DRAWING

SINGLE LINE DIAGRAM.....DWG NO. FA3–011/62055

NNA–M		
กองออกแบบสถานีไฟฟ้า ฝ่ายงานสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แบบ _____ ถูกแทนโดยแบบ _____
ผู้เขียน _____ ผู้ตรวจสอบ _____ วิศวกร _____ หัวหน้าแผนก _____ ผู้อำนวยการกอง _____ ผู้อำนวยการฝ่าย _____ (นางน)	ผู้ว่าการ _____ (นางน)	เขียนเสร็จวันที่ 27 ส.ค. 62 แก้แบบวันที่ _____ มีมติเป็น _____ มาตราส่วน _____
รองผู้ว่าการวิศวกรรม	สถานีไฟฟ้านครพนม 1 นครพนม มิเตอร์ และ รีเลย์ไดอะแกรม	แบบเลขที่ FA4–011/62077 แผ่นที่ 1 ของจำนวน 1 แผ่น
	NAKHON PHANOM 1 SUBSTATION METERING AND RELAYING DIAGRAM	