TDDP.2 – RCO (ADD)

NOTES

1. THE NEUTRAL GROUNDING RESISTORS (NGR) ARE INDICATED FOR FUTURE INSTALLATION.
2. SYNCHRONIZING SCHEMATIC
   - 2.1 0–YP–01 SHOWN THUS, REFER TO INCOMING IVT DESIGNATIONS.
   - 2.2 0BYP–01 SHOWN THUS REFERS TO RUNNING BUS IVT
   - 2.3 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.
   - 2.4 MANUAL SYNCHRONIZING BY SYNCHROSCOPE SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF METERING CORES FROM"PHASE B" FOR BOTH VT"S.
   - 2.5 AUTOMATIC SYCHRONISM VERIFICATION BY SYNCHRO CHECK RELAY (25) SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF RELAYING CORES FROM"PHASE B" FOR BOTH VT"S.
3. EACH DIGITAL POWER METER (DPM) SHALL BE COMMUNICATED WITH AUTOMATIC METER READING (AMR) APPLICATION SERVER VIA SWITCH NETWORK.
4. FOR NEW INSTALLATION, 115KV RELAY PROTECTION SHALL BE A DOUBLE MAIN PROTECTION CONFIGURATION(MAIN1&2) WHEREAS MAIN1&MAIN2 SHALL BE DIFFERENT IN PRODUCTS/MANUFACTURERS.

6. 115 kV. IVT RATIO

$\frac{115{,}000}{\sqrt{3}} : \frac{115}{\sqrt{3}} / 115 \;//\; \frac{115}{\sqrt{3}} / 115$ V (05YP–01)	50VA/0.2/1.5VF , 50VA/3P/1.5VF (SIMULTANEOUS BURDEN = 100 VA.)

115 kV. CVT RATIO

$\frac{115{,}000}{\sqrt{3}} : \frac{115}{\sqrt{3}} / 115 \;//\; \frac{115}{\sqrt{3}} / 115$ V	200VA/0.5/1.5VF , 200VA/3P/1.5VF

7. 115 kV. CT RATIO

1800/1500/1200/900/600/300 : 1/1/1/1 A.	– FOR LINE BAY (05YC–01)	75VA@1800/1/5P20 , 20VA/0.5FS5 , 20VA/5P20 , 20VA/5P20
1800/1500/1200/900/600/300 : 1/1/1/1 A.	– FOR TRANSFORMER BAY	75VA@1800/1/5P20 , 20VA/0.5FS5 , 20VA/5P20 , 20VA/5P20
500/200/100 : 1 A.	– FOR HIGH SIDE TRANSFORMER BUSHING CT.	20VA/5P20

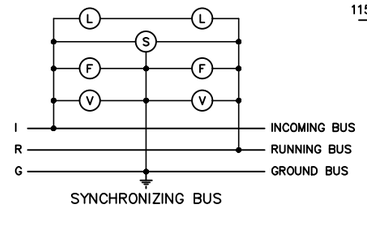
8. 22 kV. VT. RATIO

$\frac{22000}{\sqrt{3}} : \frac{110}{\sqrt{3}} // \frac{110}{\sqrt{3}}$ V	50VA/0.5/1.9VF , 50VA/3P/1.9VF

9. 22 kV. CT. RATIO

1800/1500/900	: 1/1/1/1 A	– FOR INCOMING BREAKER	20VA/5P20 , 20VA/0.5FS5 , 20VA/5P20 , 20VA/5P20
1800/1500/900	: 1/1 A	– FOR TIE BREAKER	20VA/0.5FS5 , 20VA/5P20
600/300	: 1/1 A	– FOR OUTGOING 22 kV.	20VA/0.5FS5 , 20VA/5P20
1800/1500/900	: 1/1 A	– FOR LOW SIDE TRANSFORMER BUSHING CT.	20VA/5P20 , 20VA/0.5FS5
1800/1500/900	: 1/1 A	– FOR NEUTRAL BUSHING CT.	20VA/5P20 , 20VA/5P20
600/300	: 1/1 A	– FOR CAPACITOR BANK	20VA/0.5FS5 , 20VA/5P20

DEVICES	EXPLANATION
87L	LINE CURRENT DIFFERENTIAL RELAY
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 RECLOSING 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



SYNCHRONIZING BUS

115 kV. LINE TO BANG PA–IN 2 SUBSTATION
3–2x400 SQ.mm.AAC

115 kV. LINE TO WANG NOI 1 SUBSTATION
3–2x400 SQ.mm.AAC

115 kV. LINE TO BAN LANE 1
3–2x800 SQ.mm.CU.XLPE

SCOPE OF WORK OF OTHERS
3–2x400 SQ.mm.AAC

115 kV. TRANSFER BUS

115 kV. MAIN BUS

87B 95B

01YS–03 P2 01YC–01 P1 TS DPM TS DIM TS
50BF 50/51 50N/51N
0BYS–02 01YS–02 0BYB–01 01YB–01 0BYS–01 01YS–01

02YS–03 02YP–01 (øB ONLY) LL
02YL–01
02YS–02 02YG–02 øB ONLY
02YB–01 02YS–01
87L,21/21N,50BF 79,25,67/67N
SS MAN. MODE I| TO SYNC R| BUS
øB–02YP–01, øB–0BYP–01 TO SS AUTO MODE 02YB–01

03YS–03 P2 03YC–01 P1
50BF 50/51 50N/51N
03YS–02 03YB–01 03YS–01

04YS–03 04YP–01 (øB ONLY) LL
04YL–01
04YS–02 04YG–02 øB ONLY
04YB–01 04YS–01
87L,21/21N,50BF 79,25,67/67N
SS MAN. MODE I| TO SYNC R| BUS
øB–04YP–01, øB–0BYP–01 TO SS AUTO MODE 04YB–01

05YS–03 05YP–01 (øB ONLY) LL
05YL–01
05YS–02 05YG–02 øB ONLY øB ONLY
05YB–01 05YS–01
21/21N,50BF,27/59 79,25,67/67N MAIN2
21/21N,50BF,27/59 79,25,67/67N MAIN1
SS MAN. MODE I| TO SYNC R| BUS
øB–05YP–01, øB–0BYP–01 TO SS AUTO MODE 05YB–01

0BYP–01 87T,87REF 51GB NGR BCT
3–1x400 SQ.mm. AAC 01YL–01 BCT
TP.1 3ø115–22 kV. 30/40/50MVA. ONAN/ONAF1/ONAF2 Dyn1
BCT 90 V øA–B LL
27/59 LL V METER
3–2x500 SQ.mm. CU.XLPE

87T,87REF 51GB NGR BCT
3–1x400 SQ.mm. AAC 03YL–01 BCT
TP.2 3ø115–22 kV. 30/40/50MVA. ONAN/ONAF1/ONAF2 Dyn1
BCT 90 V øA–B LL
3–2x500 SQ.mm. CU.XLPE

22 kV 3ø,3W,SWGR. MAIN BUS NO. 1

1CVB–01 P2 50/51,50N/51N 50BF TS DPM TS DIM
1CVC–01 P1 øB–C
1CVG–01 3–1x240 SQ.mm. CU.XLPE Q
SR SC LA LA 60
22 kV. CAPACITOR BANK 3 x 2.4 MVAR (DOUBLE STAR CONNECTION) SR = 0.1 mH. C1

01VB–01 P2 50/51,50N/51N 50BF,79
01VC–01 P1
01VG–01 3–1x400 SQ.mm. CU.XLPE
01VL–01 RCO 1

02VB–01 02VC–01 SAME AS 01VB–01
02VG–01 3–1x400 SQ.mm. CU.XLPE
02VL–01 RCO 2

1BVB–01 P2 50 ARC
1BVC–01 P1 50/51,50N/51N 50BF
øA–
1BVG–01

03VB–01 03VC–01 SAME AS 01VB–01
03VG–01 3–1x400 SQ.mm. CU.XLPE
03VL–01 RCO 3

04VB–01 04VC–01 SAME AS 01VB–01
04VG–01 3–1x400 SQ.mm. CU.XLPE
04VL–01 RCO 4

05VB–01 05VC–01 SAME AS 01VB–01
05VG–01 3–1x400 SQ.mm. CU.XLPE
05VL–01 RCO 5

1TVS–01 1TVC–01 1TVG–01 3–1x95 SQ.mm. CU.XLPE LL 81 27/59
1TVL–01 TO STATION SERVICE TRANSFORMER–TS.1 22–0.400/0.230kV. 100kVA. Dyn11

0BVB–01 P2 P1 0BVC–01 50/51,50N/51N 50BF
0BVP–01 0BVP–02 TS DPM TS DIM LL 81 27/59

2TVS–01 2TVC–01 2TVG–01 3–1x95 SQ.mm. CU.XLPE
2TVL–01 TO STATION SERVICE TRANSFORMER–TS.2 22–0.400/0.230kV. 100kVA. Dyn11

06VB–01 P2 50/51,50N/51N 50BF,79
06VC–01 P1
06VG–01 3–1x400 SQ.mm. CU.XLPE
06VL–01 RCO 6

07VB–01 07VC–01 SAME AS 06VB–01
07VG–01 3–1x400 SQ.mm. CU.XLPE
07VL–01 RCO 7

08VB–01 08VC–01 SAME AS 06VB–01
08VG–01 3–1x400 SQ.mm. CU.XLPE
08VL–01 RCO 8

2BVB–01 P2 50 ARC
2BVC–01 P1 50/51,50N/51N 50BF
øA–
2BVG–01

22 kV 3ø,3W,SWGR. MAIN BUS NO. 2

09VB–01 09VC–01 SAME AS 06VB–01
09VG–01 3–1x400 SQ.mm. CU.XLPE
09VL–01 RCO 9

10VB–01 10VC–01 SAME AS 06VB–01
10VG–01 3–1x400 SQ.mm. CU.XLPE
10VL–01 RCO 10

2CVB–01 P2 50/51,50N/51N 50BF TS DPM TS DIM
2CVC–01 P1 øB–C
2CVG–01 3–1x240 SQ.mm. CU.XLPE Q
SR SC LA LA 60
22 kV. CAPACITOR BANK 3 x 2.4 MVAR (DOUBLE STAR CONNECTION) SR = 0.1 mH. C2

TO IVT'S FOR SS AUTO MODE ABOVE
øB–02YP–01 øB–0BYP–01 SS AUTO MODE FOR 02YB–01
øB–04YP–01 øB–0BYP–01 SS AUTO MODE FOR 04YB–01
øB–05YP–01 øB–0BYP–01 SS AUTO MODE FOR 05YB–01
25
INCOMING BUS FOR LINE IVT–øB ONLY 0–YP–0–
RUNNING BUS FOR BUS IVT–øB ONLY 0BYP–01
COMMON GROUND BUS
AUTOMATIC MODE–SYNCHRO–CHECK SCHEMATIC

ADDITIONAL WORK

FUTURE

REFERENCE DRAWING

SINGLE LINE DIAGRAM.....DWG NO. FA3–011/63024

RCO–M

กองออกแบบสถานีไฟฟ้า ฝ่ายงานสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ —
ผู้เขียน ณัตรบดินทร์	ผู้ว่าการ (แทน)	ถูกแทนโดยแบบ —
ผู้สำรวจ —	สถานีไฟฟ้าโรจนะ 2 จ.อยุธยา (เพิ่มเติม) มิเตอร์ และ รีเลย์ไดอะแกรม	เขียนเสร็จวันที่ 15 เม.ย. 63
วิศวกร		แก้แบบวันที่ —
หัวหน้าแผนก วรเวช		มิติเป็น —
ผู้อำนวยการกอง		มาตราส่วน —
ผู้อำนวยการฝ่าย (แทน)	ROTCHANA 2 SUBSTATION (ADD) METERING AND RELAYING DIAGRAM	แบบเลขที่ FA4–011/63039
รองผู้ว่าการวิศวกรรม		แผ่นที่ 1 ของจำนวน 1 แผ่น