	PROTECTIVE DEVICE AND THEIR DESIGNATIONS																																					
	CAPACITOR BANK C1			OUTGOING NO.1		OUTGOING NO.2		INCOMING LINE NO.1					OUTGOING NO.3		OUTGOING NO.4		OUTGOING NO.5		BUS COUPLING BREAKER		OUTGOING NO.6		OUTGOING NO.7		OUTGOING NO.8		INCOMING LINE NO.2					OUTGOING NO.9		OUTGOING NO.10		CAPACITOR BANK C2		
	OVERCURRENT PHASE AND GROUND RELAY	CAPACITOR BANK UNBALANCE SENSING RELAY	CAPACITOR BANK BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	22kV.SWITCHGEAR MAIN BUS NO.1 ARC PROTECTION	INCOMING LINE BREAKER FAILURE RELAYING	UNDER FREQUENCY RELAY	UNDER AND OVER VOLTAGE RELAY	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	BUS COUPLING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	22kV.SWITCHGEAR MAIN BUS NO.2 ARC PROTECTION	INCOMING LINE BREAKER FAILURE RELAYING	UNDER FREQUENCY RELAY	UNDER AND OVER VOLTAGE RELAY	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	OUTGOING BREAKER FAILURE RELAYING	OVERCURRENT PHASE AND GROUND RELAY	CAPACITOR BANK UNBALANCE SENSING RELAY	CAPACITOR BANK BREAKER FAILURE RELAYING
LOCATION OF DEVICE (PNL.NO.)	C1			01		02		I1					03		04		05		BC1		06		07		08		I2					09		010		C2		
DEVICE NO.	50/51 50N/51N	60	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 ARC	50 BF	81	27/59	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	50 ARC	50 BF	81	27/59	50/51 50N/51N	50 BF	50/51 50N/51N	50 BF	50/51 50N/51N	60	50 BF
AUXILIARY TIMING RELAY																																						
AUXILIARY TRIPPING RELAY			86 BF		86 BF		86 BF		86 ARC	86 BF	81X			86 BF		86 BF		86 BF		86 BF		86 BF		86 BF		86 BF		86 ARC	86 BF	81X			86 BF		86 BF			86 BF
TRIPPING RELAY CHARACTERISTICS			HS ER		HS ER		HS ER		HS ER	HS ER	SS SR			HS ER		HS ER		HS ER		HS ER		HS ER		HS ER		HS ER		HS ER	HS ER	SS SR			HS ER		HS ER			HS ER
OPERATION TARGET/AUDIBLE ALARM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
FUNCTION OF DEVICE																																						
1CVB-01	T		T_1		T_1		T_1		T_1	T_1		T_1		T_1		T_1		T_1																				
01VB-01			T_1	T_R	T_1		T_1		T_1	T_1	T	T_1		T_1		T_1		T_1																				
02VB-01			T_1		T_1	T_R	T_1		T_1	T_1	T	T_1		T_1		T_1		T_1																				
1BVB-01			T_1		T_1		T_1	T	T_1	T_1		T_1		T_1		T_1		T_1		T_1																		
03VB-01			T_1		T_1		T_1		T_1	T_1	T	T_1	T_R	T_1		T_1		T_1																				
04VB-01			T_1		T_1		T_1		T_1	T_1	T	T_1		T_1	T_R	T_1		T_1																				
05VB-01			T_1		T_1		T_1		T_1	T_1	T	T_1		T_1		T_1	T_R	T_1																				
0BVB-01			T_1		T_1		T_1		T_1	T_1		T_1		T_1		T_1		T_1	T	T_1		T_1		T_1		T_1		T_1	T_1				T_1		T_1			T_1
06VB-01																					T_R	T_1		T_1		T_1		T_1	T_1	T			T_1		T_1			T_1
07VB-01																						T_1	T_R	T_L		T_1		T_1	T_1	T			T_1		T_1			T_1
08VB-01																						T_1		T_1	T_R	T_1		T_1	T_1	T			T_1		T_1			T_1
2BVB-01																				T_1		T_1		T_1		T_1	T	T_1	T_1				T_1		T_1			T_1
09VB-01																						T_1		T_1		T_1		T_1	T_1	T		T_R	T_1		T_1			T_1
10VB-01																						T_1		T_1		T_1		T_1	T_1	T			T_1	T_R	T_1			T_1
2CVB-01																						T_1		T_1		T_1		T_1	T_1				T_1		T_1	T		T_1
02YB-01									T_1	T_1																												
03YB-01																												T_1	T_1									
C-BANK VACUUM SWITCHES-SWGR NO.1		T_1										T_1																										
C-BANK VACUUM SWITCHES-SWGR NO.2																															T_1						T_1	

NOTES

1. EACH PANEL SHALL HAVE IT OWN AUXILIARY TRIPPING AND LOCKOUT RELAYS ; ONE FOR EACH BREAKER FAILURE PROTECTION AND THE OTHER ONE FOR ARC PROTECTION. IF ANY BREAKER FAILURE OCCURS, ITS BREAKER FAILURE RELAYING SHALL INITIATE ALL BREAKER AUXILIARY TRIPPING AND LOCKOUT RELAYS TO TRIP ALL BREAKERS WHICH ARE CONNECTED WITH THE SAME BUS INCLUDING THE BUS SECTION BREAKER, EXCEPT FOR THE INCOMING BREAKER FAILS, THE INCOMING BREAKER FAILURE RELAYING SHALL, IN ADDITION TO THE ABOVE FUNCTIONS, TRIP AND LOCKOUT 115 kV TRANSFORMER BREAKER. SIMILARY, THE ARC DETECTION SHALL HAVE THE SAME TRIP AND LOCKOUT FUNCTIONS AS THOSE FOR THE BREAKER FAILURE PROTECTION.
2. EACH UNDER FREQUENCY RELAY SHALL BE FURNISHED TO PERFORM THE LOAD SHEDDING SCHEME BY USING A CUT-OFF SWITCH (81CO) FOR TRIPPING THE OUTGOING LINE AS REQUIRED.
3. IN CASE OF OVERVOLTAGE TO THE CAPACITOR BANKS, THE OVERVOLTAGE RELAY (59) SHALL TRIP ALL VACUUM SWITCHES OF THE CAPACITOR BANKS AND PROVIDE THE CONTACT TO RESET THE POWER FACTOR CONTROLLER TO RETURN TO THE NEUTRAL STAGE TO PREVENT THE POWER FACTOR CONTROLLER FROM RECLOSING THE VACUUM SWITCHES AGAIN.
4. BAY CONTROL UNIT (BCU) IS INTEGRATED IN PROTECTIVE RELAY.
5. FOR CIRCUIT BREAKER FAILURE FUNCTION (50BF) AND ARC PROTECTION FUNCTION (50ARC) SHALL BE TRIP VIA GOOSE.

LEGEND	EXPLANATION
Y	YES
HS	HIGH SPEED
SS	STANDARD SPEED
ER	ELECTRICAL RESET
SR	SELF RESET
T_R	3-POLE TRIP AND RECLOSE
T	3-POLE TRIP- NO RECLOSING
T_L	3-POLE TRIP AND LOCKOUT
T_1	BREAKER TRIP FOR CB FAILURE AND ARC PROTECTIONTRIP BY GOOSE

REFERENCE DRAWING

- METERING AND RELAYING DIAGRAM..................................DWG NO. FA4-011/63023

OYM-PP

กองออกแบบสถานีไฟฟ้า ฝ่ายงานสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ — ถูกแทนโดยแบบ —
ผู้เขียน ศุภชัย ผู้สำรวจ — วิศวกร — หัวหน้าแผนก วรเวช ผู้อำนวยการกอง ผู้อำนวยการฝ่าย (แทน)	ผู้ว่าการ (แทน) สถานีไฟฟ้าอ้อมใหญ่ 4 จ. นครปฐม ฟังก์ชั่นการทำงานของอุปกรณ์ป้องกัน	เขียนเสร็จวันที่ 3 มี.ค. 2563 แก้แบบวันที่ — มิติเป็น — มาตราส่วน —
รองผู้ว่าการวิศวกรรม —	OM YAI 4 SUBSTATION PROTECTIVE DEVICE FUNCTION	แบบเลขที่ FA4-011/63024 แผ่นที่ 2 ของจำนวน 2 แผ่น