

		PROTECTIVE DEVICES AND THEIR DESIGNATIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		115 KV. INCOMING LINE NO.3 TO BANG PA IN 2 SUBSTATION(EGAT)										115 KV. LINE TO NAVA NAKHON 1 SUBSTATION					115 KV. LINE TO ROTCHANA 2 SUBSTATION					115 KV. LINE TO BANG KRASAN 2 SUBSTATION					115 KV. INCOMING LINE NO.1 TO BANG PA IN 2 SUBSTATION(EGAT)					115 KV. LINE TO BAN LANE 2 SUBSTATION					115 KV. LINE TO BAN LATSAI SUBSTATION					115 KV. LINE TO BANG KRASAN 1 SUBSTATION					115 KV. INCOMING LINE NO.2 TO BANG PA IN 2 SUBSTATION(EGAT)					115 KV BUS COUPLING BREAKER		115 KV MAIN BUS 1		115 KV MAIN BUS 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		MAIN 1 & MAIN2										MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2					MAIN 1 & MAIN2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
LINE CURRENT DIFFERENTIAL RELAY (MAIN 1 ONLY)		DISTANCE RELAY PHASE & GROUND ZONE #1 OR TELE PROTECTION DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY WITH TELE PROTECTION LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY TRIP COMMAND FROM 50BF EGAT										DISTANCE RELAY PHASE & GROUND ZONE #1 DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY					DISTANCE RELAY PHASE & GROUND ZONE #1 DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY WITH TELE PROTECTION LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY					DISTANCE RELAY PHASE & GROUND ZONE #1 OR TELE PROTECTION DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY WITH TELE PROTECTION LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY TRIP COMMAND FROM 50BF EGAT					DISTANCE RELAY PHASE & GROUND ZONE #1 DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY					DISTANCE RELAY PHASE & GROUND ZONE #1 DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY					DISTANCE RELAY PHASE & GROUND ZONE #1 OR TELE PROTECTION DISTANCE RELAY PHASE & GROUND ZONE #2 DISTANCE RELAY PHASE & GROUND ZONE #3 DIRECTIONAL RELAY PHASE & GROUND OVERCURRENT RELAY WITH TELE PROTECTION LINE BREAKER FAILURE RELAYING AC.UINDER/OVER VOLTAGE RELAY TRIP COMMAND FROM 50BF EGAT					BUS COUPLING BREAKER FAILURE RELAYING		BUS DIFFERENTIAL RELAY		CT SUPERVISION RELAY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
LOCATION OF DEVICE (PMLNO.)		LRP9 & LCP9										LRP8 & LCP8					LRP7 & LCP7					LRP6 & LCP6					LRP5 & LCP5					LRP4 & LCP4					LRP3 & LCP3					LRP2 & LCP2					LRP1 & LCP1					BCP		B2P																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
DEVICE NO.		87L	21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			87L	21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			87L	21-1 21N-1	21-2 21N-2	21-3 21N-3	67 67N	50 BF	27 59			50 BF	87 B1	95 B1	87 B2	95 B2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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NOTES

1. EACH RELAY LINE TERMINAL SHALL UTILIZE A LINE CURRENT DIFFERENTIAL RELAY OR A DISTANCE RELAY AS A DOUBLE MAIN PROTECTION WITH/WITHOUT PILOT TRIPPING SCHEME FOR PROTECTION OF 115 kV LINE AGAINST BOTH PHASE AND GROUND FAULTS AS FOLLOWS :
 - FOR 115 kV. INCOMING LINE, A LINE CURRENT DIFFERENTIAL RELAY OR A DISTANCE RELAY SHALL BE USED WITH A DEDICATED FIBER–OPTIC CABLE AS A MAIN PROTECTION. THE DEDICATED FIBER–OPTIC CABLE SHALL BE USED AS A COMMUNICATION LINK TO PERMIT HIGH SPEED THREE–POLE INTERTRIPPING OF BREAKERS AT BOTH ENDS OF THE LINE. THE RECLOSURE FOR BOTH LINE CURRENT DIFFERENTIAL RELAY AND DISTANCE RELAY ZONE#1 SHALL BE DONE THROUGH A SYNCHRO–CHECK RELAY.
 - FOR 115 kV. OUTGOING LINE, A LINE CURRENT DIFFERENTIAL RELAY OR A DISTANCE RELAY SHALL BE USED AS A MAIN PROTECTION WITH PILOT TRIPPING SCHEME. DISTANCE RELAY ZONE#1 SHALL BE USED FOR HIGH SPEED THREE–POLE TRIPPING AND RECLOSING. THE RECLOSURE SHALL BE DONE THROUGH A SYNCHRO–CHECK RELAY.
 - FOR ZONE#2 AND ZONE#3 OF EACH DISTANCE RELAY, SHALL BE FURNISHED WITH A TIMING RELAY WITH TWO SEPARATE TIMING UNITS THAT WILL PROVIDE TIME–DELAYED TRIP FOR ZONE#2 AND ZONE#3.
 - THE MAIN PROTECTION OF BOTH TYPES 115 kV LINES, SHALL BE LINE CURRENT DIFFERENTIAL RELAY, PHASE/GROUND DISTANCE RELAY AND DIRECTIONAL PHASE/GROUND OVERCURRENT RELAY FOR PHASE AND GROUND FAULT PROTECTION.
 - FOR BOTH TYPES OF THE 115 kV LINE, EACH PHASE AND GROUND RELAY SHALL BE PROVIDED WITH A PROVISION OF VOLTAGE–POLARIZED DIRECTIONAL UNIT.
2. THE BREAKER FAILURE AUXILIARY TRIPPING AND LOCKOUT RELAY (86BF) SHALL BE INITIATED BY LINE OR TRANSFORMER PROTECTION, AND IT SHALL TRIP ALL BUS NO.1 BREAKERS AND THE BUS COUPLING BREAKER WHEN THE FAILED BREAKER IS CONNECTED WITH THE BUS NO.1 OR TRIP ALL BUS NO.2 BREAKERS AND THE BUS COUPLING BREAKER WHEN THE FAILED BREAKER IS CONNECTED WITH THE BUS NO.2 .
3. ALL PROTECTIVE TRIPPING FUNCTION ENERGIZED BOTH TRIP COILS OF 115 kV. CIRCUIT BREAKER.
4. THE CONTRACTOR SHALL PROVIDE ALL AUXILIARY EQUIPMENT AND ACCESSORIES TO COMPLETE THE ABOVE FUNCTION.

LRP9& LCP9	LRP8& LCP8	LRP7& LCP7	LRP6& LCP6	LRP5& LCP5	LRP4& LCP4	LRP3& LCP3	LRP2& LCP2	LRP1& LCP1	BCP	BZP
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SWING RACK TYPE CONTROL AND PROTECTIVE RELAY PANEL

BZP – BUS ZONE PROTECTION PANEL

BCP – BUS CONTROL PANEL

LRP – LINE RELAY PROTECTION PANEL

LCP - LINE CONTROL PANEL

LEGEND	EXPLANATION
Y	YES
HS	HIGH 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 _{L1}	BREAKER TRIP FOR CB FAIL (TIME DELAY) VIA BUSBAR PROTECTION TRIP BY GOOSE
86DDT	DIRECT TRANSFER TRIPPING LOCKOUT RELAY
T ₁	TRIP FROM INCOMING 50BF VIA REMOTE I/O MODULE

กองออกแบบสถานีไฟฟ้า ฝ่ายงานสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ _____ - ถูกแทนโดยแบบ _____ -
ผู้เขียน _____ สุวิกรม ผู้สำรวจ _____ สุวิกรม ศุภชัย วิศวกร _____ สุวิกรม	ผู้ว่าการ _____ (แทน)	เขียนเสร็จวันที่ 12 ต.ค. 2564 แก้แบบวันที่ _____ -
หัวหน้าแผนก _____ วรเวช ผู้อำนวยการกอง _____ ผู้อำนวยการฝ่าย _____ (แทน)	สถานีไฟฟ้าบางปะอิน 2 จังหวัดพระนครศรีอยุธยา ฟังก์ชันการทำงานของอุปกรณ์ป้องกัน	มิติเป็น _____ - มาตราส่วน _____ -
รองผู้ว่าการวิศวกรรม _____ _____	BANG PA IN 2 SUBSTATION PHRA NAKHON SI AYUTTHAYA PROVINCE PROTECTIVE DEVICE FUNCTION	แบบเลขที่ FA4-011/64048 แผ่นที่ 1 ของจำนวน 1 แผ่น