



- NOTES:**
- CALCULATE ACCORDING TO THE REAL RATED THERMAL BURDEN FOR HV VOLTAGE TRANSFORMER
 - CALCULATE THE PRIMARY VALUES TAKING INTO ACCOUNT THE WIND FARM POWER, THE SHORT CIRCUIT CURRENT AT THE CONNECTION POINT AND THE PROTECTION RELAYS REQUIREMENTS. IT IS POSSIBLE TO HAVE DIFFERENT CURRENT TRANSFORMER PRIMARY VALUES FOR MEASURE AND FOR PROTECTION. FOR THE DIFFERENTIAL POWER TRANSFORMER PROTECTION THE CURRENT TRANSFORMER PRIMARY VALUE HAS TO BE CALCULATED AND IT DEPENDS ON THE TRANSFORMER POWER.
 - MEASUREMENT EQUIPMENT MUST BE ADAPTED TO THE SPECIFIC REQUIREMENTS OF THE INSTALLATION. IF THE OFFICIAL MEASUREMENT POINT IS IN THE SUBSTATION UNDER DESIGN, CHECKING MEASUREMENT WILL BE INSTALLED IN CT SERIES WITH THIS EQUIPMENT.
 - FUNCTION 25 WILL BE USED OR NOT DEPENDING ON UTILITY REQUIREMENTS.
 - PROTECTIONS SEL-311C (21) AND RED670 (87L) ARE THE EDRP STANDARD ONES AND MUST BE CHECKED ACCORDING TO REQUIREMENTS OF CONNECTION POINT (UTILITY). IN THE CASE OF POINT TO POINT CONNECTION IT MUST BE STUDIED TO REPLACE RED670 BY A LOWER MODEL. COMMUNICATION WILL BE IEC 61850.
 - 50BF SPARE FUNCTION IN PP-L1
 - CONTROL AND PROTECTION SYSTEM CAN BE ANY OF THE QUALIFIED ONES BY EDRP: EITHER ABB OR INGETEAM (THAT MEANS THE USE OF EITHER REC650 OR INGETEAM EQUIVALENTS) COMMUNICATION WILL BE IEC 61850.
 - A CT FOR THERMAL IMAGING (49) SHALL BE INSTALLED IN THE CENTRAL BUSHING OF THE HV SIDE IN THE FOLLOWING CASES:
 - 220kV AND RATED POWER HIGHER OR EQUAL TO 60MVA
 - 110-132-138-150kV AND RATED POWER HIGHER OR EQUAL TO 90MVA IF IT IS NOT THE CASE, (49.1 HV) HAS TO BE REMOVED
 - CHARACTERISTICS OF CT INSTALLED IN MV CENTRAL BUSHING OF POWER TRAFOR FOR THERMAL IMAGEN (49) WILL BE THE ONES DEFINED BY THE POWER TRANSFORMER MANUFACTURER
 - CHARACTERISTICS OF CT INSTALLED IN MV CENTRAL BUSHING OF POWER TRANSFORMER FOR REG-DA (90) WILL BE THE ONES INDICATED IN SPECIFICATION TCSU-E&C-SBST-00002, AND THE PRIMARY VALUE WILL BE INDICATED BY THE POWER TRANSFORMER MANUFACTURER
 - STANDARD POWERS FOR POWER TRANSFORMER TO BE DEFINED ACCORDING TO SPECIFICATION TCSU-EU-E&C-SBST-00002
 - PTZ1 IS EITHER PROTECTION ABB REF615, OR INGETEAM EQUIVALENT.
 - THE HV NEUTRAL IS NOT CONNECTED TO EARTH BUT THE EARTHING DISCONNECTOR IS STILL INSTALLED TO BE PREPARED IN CASE FUTURE TSO/DSO REQUIREMENTS.
 - THE UTILITY COULD REQUIRE THE INSTALLATION OF CIRCUIT BREAKER WITH SINGLE PHASE CONTROL. IN THIS CASE, THE PROTECTION RELAY SHALL BE PREPARED TO PERFORM SINGLE PHASE RE-CLOSING AND POLE DISCORDANCE PROTECTION.
 - IT IS REQUIRED A THIRD TRIP COIL AS MINIMUM VOLTAGE COIL.
 - A DOUBLE TRANSFORMER DIFFERENTIAL PROTECTION SHALL BE INSTALLED FOR VOLTAGES EQUAL OR GREATER THAN 220kV.
 - A DOUBLE TRANSFORMER DIFFERENTIAL PROTECTION SHALL BE INSTALLED FOR VOLTAGES BELOW 220 kV WHEN THE POWER THEREOF IS EQUAL OR GREATER THAN 90 MVA.
 - THE CONTROL UNIT MAY INCLUDE THE DIFFERENTIAL PROTECTION FUNCTION AS BACKUP.
 - FOR SUBSTATIONS WITH TWO POWER TRANSFORMERS OF DIFFERENT PROMOTERS, A SECOND VOLTAGE TRANSFORMER MUST BE ADDED IN ORDER TO SEPARATE PROTECTIONS FROM MEASUREMENT

- X SYMBOL CLOSED
- ⊠ SYMBOL OPEN
- ∧ CONDITION "AND"
- ∨ CONDITION "OR"

SYMBOL	OPERATIONS	INTERLOCKING CONDITIONS
89-T1	CLOSE/OPEN	52-T1
89-T2	CLOSE/OPEN	52-T2
89-TZ-T1	CLOSE/OPEN	52-T1
89-TZ-T2	CLOSE/OPEN	52-T2
89N-T1	CLOSE/OPEN	52-T1
89N-T2	CLOSE/OPEN	52-T2
89-L1-1	CLOSE/OPEN	52-L1
89-L1-2	CLOSE/OPEN	52-L1 A57-L1
57-L1	CLOSE/OPEN	89-L1-2 ∧ 98PBH-L1 ∧ 27 WITHOUT VOLTAGE
52-L1	CLOSE	(89-L1-1 ∨ 89-L1-2) ∧ (89-L1-2 ∨ 89-L1-2) ∧ 50BF NOT ACTED ∧ (3-1 NOT ACTED ∨ 3-2 NOT ACTED)
52-T1	CLOSE	(89-T1 ∨ 89-T1) ∧ 50BF NOT ACTED ∧ (3-1 NOT ACTED ∨ 3-2 NOT ACTED) ∧ 86-1-T1 NOT ACTED ∧ 86-2-T1 NOT ACTED
52-T2	CLOSE	(89-T2 ∨ 89-T2) ∧ 50BF NOT ACTED ∧ (3-1 NOT ACTED ∨ 3-2 NOT ACTED) ∧ (86-1-T2 NOT ACTED ∧ 86-2-T2 NOT ACTED)

SEZIONE TR FUTURA

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