5.0	**SUBHEAD-5**					
1	**TRANSFORMER 500KVA:**					
	11KV, 500KVA PACKAGE SUBSTATION & HT SYSTEM					
	Supply, Erection, Testing and Commisioning of HT 11kV Package Substations is completely self-contained Solution for power distribution that includes Pre fabricated outdoor duty enclosure, high voltage switchgear, distribution transformer, low voltage panel and accessories such as power factor improvement equipment, control and protection equipments, all providing a cost effective. The complete unit shall be installed on a substation plint (base) as outdoor substation. Package substation shall have the following equipments: 11kV Switchgear: 11 kV, 3 Phase, SF6 compact switchgear panel with 11kV Load break switches controls incoming-outgoing feeder cables of 11kV ring main distribution system and Vacuum circuit breaker (VCB) as protection to the transformer. The Load break switch, Vacuum circuit breaker, Bus bars should be mounted inside a sealed robotically welded stainless steel tank enclosure. The operating mechanism of switches and breakers shall be outside the SF6 tank and accesible from front. The tank should be filled with SF6 gas at an adequate pressure. The degree of protection for gas tank should be IP67.					
	There shall be provision for filling the SF6 gas at site. Stainless steel gas tank shall confirm to the sealed pressure system and ensure the gas leakage to 0.1% per year as per IEC 60298. The Panels shall be tested for IAC level of min. 21kA/1 Sec. No. of operations of Vacuum interrupter bottles for better performance (i) At rated current: 10,000 operation (ii) No. of short circuit dead operation at rated short circuit current: 40 opeartion. Load break switch parameters are as below: (a). 11kV, 3Phase HT manually operated Load break switches 630Amp., copper busbars with Integral earth switch having ON/OFF/EARTHED indiaction, live cable indiaction cable termination bushing suitable for 300sq mm XLPE cable. (b). Type: Load breaking and fault making in SF6 tank (c). Fault making capacity : 52.5kAp (d). Operating Mechanism: Operating handle with ON, OFF, Earth positions with arrangement for padlocking in each position VCB parameters are as below: (a). Rated Voltage/ PF withstand/ Impulse withstand: 11kV/28kV/52.5kVp (b). Rated short circuit breaking current withstand : Min. 21kA for 3sec. (c). Operating mechanism: Trip free & free handle type mechanically operated indication & pad locking (d). Cast Resin CT's 11kV : 600-300/1-1A, Core1: Class1, 10VA for 3phase, Core2: 5P10, 10VA (e). Digital Ammeter : Applicable Range with necessary ammeter with built in selector switch & suitable for 110V AC 96x96 sq.mm dial with shrouded terminal. (f). Protections : Numerical instantaneous IDMTL mimic dispaly relay : E/F, O/C, S/C & TCS with RS485 Modbus protocol for communication & drawout type (g). Master Trip/ Anti pumping relay (h). Transformer Protection :3 elements auxiliary relay (230V, AC, 50Hz) for					

	transformer fault, Alarm for Buchholz, winding temperature & oil temperature	
	Transformer: 11KV/433V Distribution Transformer, Three Phase 50 Hz, Oil Immersed, Naturally Cooled ONAN, Core type double wound with copper conductor cnforming to IS : 2026 and IS 1180 (Part -1) Level 3 BEE Star 2 with all latest amendments, vector group Dyn11 suitable for packaged substation housed in a enclosure with corrugated tank arrangement hermeatically sealed. Transformer parameters are as follows: (a). Off Circuit Tap changer: +5% to -10% off circuit tapping in steps of 2.5%. (b). Permissible Temp. Rise of Oil: 40°C (c). Permissible Temp. Rise of Winding 45°C (d). Magnetic Core: Prime grade of M4 or better (e). System Highest Voltage :- 12kV at the HV side (f). Terminations: Cable Box on HV & LV Side (g). Insulation Level: • H.V. Power Frequency (KV rms) : 28 kV • H.V. Impulse withstand voltage (KV peak): 75 kVp (Hermaticaly sealed transformer) Enclosure for PSS: Outdoor type enclousre shall be made of 2mm thickness of galvanised sheet steel tropicalised to meet indian weather conditions including all the partition sheets and doors. The enclosure shall be corrugated type wall design for better heat dissipation, provinding robust construction and enclousre should have IP54 degree of protection for HT & LT switchgear compartment & IP 23 protection for transformer compartment. the base of the enclosure shall be of 4mm thickness hot dip galavanized sheet steel to ensure rigidity for easy transport & installation. The entire package substation shall be factory assemble & factory fitted. Each compartment should be provided with the door and pad locking arrangement. The unit shall be tested for internal arc fault test to the tune atlest 20kA for 1 second as per latest IEC 62271-202.Interconnection & Earthing: Interconnection between HT switchgear & transformer using screened covered aluminium XLPE single core cable & interconnection between transformer & LT switchgear using aluminium busbars with copper flexibles. Internal earthing connections by 50x 6mm G.I strips.	
	LT switchgear: The LV compartment with Degree of protection-IP54 designed for a 50 degree C ambient temperature. The panel is modular, dead front, freestanding, floor mounted and comprises the following equipment (a). LT switchgear with 433V suitable ampere rating Aluminium busbars with 100% neutral (b). 1 No. MCCB/ ACB FP microprocessor based for O/C, S/C & E/F Integrated release type for incomer according to the KVA rating of the transformer Metering compartment: (a). 1 No.Digital multi functional meter class1.0 APFC Panel: (a). Capacitor Banks shall be suitable for operation at 440V Three phases. The type of capacitor banks shall be self healing MPP type Heavy duty as per IS: 13340-1993 and shall be housed in sheet steel container to ensure the explosion free design. The external discharge resistors shall also be provided. Capacitor Banks shall be suitable for Overloading as 115% for Over Current and 110% for Over Voltage. The Watt Loss shall not be less than 0.5w/kVAr. The Relay shall be of 12 stages to improve the power factor at least 0.98. The relay shall be microprocessor based with self diagnostic and setting including C/K ratio.	
	Package Substation 11kV HT Switchgear with 2 way RMU (RRL), consisting of 2 Nos. manually operated Load Break Switch 630 Amp., 1 No. manually operated VCB 630 Amp., 11KV/433V,	NSR

	500kVA ONAN type transformer LT PANEL: 4 Pole, 800A, Microporcessor based, EDO ACB with S/C, O/C & earth fault release. Release should be with all Energy parameter (Class 1 accuracy) & THD% on display with last 20 Trip history. ACB should be communication capable through NFC, blue tooth & Ethernet (all three options). The fault system of Icw= 50 kA for 1 sec.. Tripping time < 30 msec. APFC PANEL: 1 No. MCCB TP Pole 315A Ics= 50kA Thermal magnetic with Double break mechanism. Intelligent APFC Relay with 150 kVAr MPP Heavy duty Capacitor with suitable rating of contactors & Short ckt. protection device for each banking. MAKE: Schneider, Siemens, L&T, ABB					