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ANNEXURE-I

Tender No. : DID3557P07/GC
Tender Date : 25.11.2006

Item No./ Mat. Code	Material Description	Quantity	UOM
10 0C000161	**ANNEXURE-I** TECHNICAL SPECIFICATIONS OF 1000KVA DRY TYPE TRANSFORMER 1000kVA, 11kV/433V, 3 Phase, 50 Hz, double winding, copper conductor, Dry type, Cast Resin Insulated, natural air cooled distribution transformer for indoor use & as per following data sheet: A. GENERAL: 1. Applicable Indian Standard: IS: 11171 with latest amendments. 2. Service duty : Continuous. 3. Installation : Indoor. 4. Auxiliary power supply : 240V AC ± 10 % 5. Control Voltage : 240V AC ± 10 % 6. Make: NGEF, Crompton Greaves, Alstom, Bharat Bijlee. B. SITE CONDITION: 1. a) Maximum Ambient air temperature : 40 º C b) Minimum Ambient air temperature : 6.0 º C 2. Maximum humidity at site (at 40 º C) : 98 % 3. Surrounding atmospheric condition : Humid 4. Site altitude : 120mtr 5. Seismic design co-efficient : As per IS : 1983 6. Rainfall : 250cm annually. C. RATING AND GENERAL DATA: 1. Rating : 1000kVA, continuously rated. 2. No. of phases : 3. 3. Frequency : 50 ± 3 % 4. Type of Insulation : Cast Resin winding, Class-F. Temp. rise-90 º C 5. Partial discharge: As per IS-11171, IS-6209. 6. Type of cooling: AN 7. Installation: Indoor 8. Vector group : Dyn 11 9. Percentage impedance: Below 5%. Tolerance as per IS-2026. 10. Nominal voltage ratio: 11kV/433V. 11. Type of neutral earthing : Directly grounded Neutral. 12. Symmetric short circuit withstand capacity : As per IS-11171. 13. Rated short duration power frequency withstand voltage : As per IS 11171. 14. Rated lightning impulse withstand voltage: As per IS 11171 (List-2). 15. TAP CHANGER: Type : OFF Circuit. Total tapping range : ± 5.0 % Tapping steps : In steps of 2.5 %. 16. TERMINAL ARRANGEMENT: HV winding line end : Cable box with bushings. LV winding line end : Cable box with bushings.	1	NO

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	One LV Neutral bushing inside the cable box and one (additional) outside the cable box. 17. BUSHING: Made from non hygroscopic epoxy resin cast material suitable for site condition mention in para- B & confirming to IS-2099. 18. CABLE BOX: a) HV cable box should be suitable for termination of 1 no. 3 C, 240sq. mm XLPE, armoured, aluminium conductor cable with heat shrink type cable termination. Bottom plate should be detachable. Cable Box as per IP-54. Suitable non hygroscopic bushings are required for supporting the cable connection. b) LV cable box should have brought out electro-tinned copper busbars of suitable rating & size for termination of 8 nos. of 3 ½ C x 240 sq. mm PVCA Aluminium cable. The busbar should have suitable holes (two nos. for each cable lug as lug with double hole will be used for termination) and provided with hardwares for termination of cables. The cable box should have detachable cable gland plate fitted with suitable heavy duty single compression cable glands for the cables mentioned above. Support for busbar in LV cable box should be made from FRP/SMC non hygroscopic material. Cable Box as per IP-54. Supports should be able to withstand the short circuit stressess. c) Terminals should be marked as per IS: 2026 #1977. 19. TRANSFORMER CORE: a) Material: High grade cold rolled grain oriented silicon steel for very low iron loss. b) Structure : Grounded and sharp corners avoided. c) Lamination: Treated and coated with suitable insulations. The core limbs & yokes are banded by means of resiglass tape to reduce vibration & noice. 20. TRANSFORMER WINDING: The winding material should be high conductivity electrolytic grade copper. The insulation should be Cast Resin type, Class-F. Conductor should have thermally upgraded paper (Nomex) insulation reinforced with fibreglass. The coil assembly is to be impregnated & cast under vacuum with epoxy resin for achieving non-hygroscopic, acid & alkali resistant insulation. The complete winding should have smooth cylindrical finish after impregnation to ensure high mechanical strength. The thickness of resin should be uniform. The insulation should be self- extinguishing type. Joints in the winding should be as under. a) Permanent joints : Welded/ brazed. b) Bolted connection : Provided with locking devices. 21. ENCLOSURE: The core & winding assembly should be housed inside a sheet steel enclosure with removable inspection & tap changer covers. The enclosure should offer IP-23 protection as per IS-2147 & should have suitably designed louvres for circulation of cooling air. All the gaskets should be of neoprene rubber. Enclosure should be powder coated with DA Grey paint after surface treatment for corrosion protection. All openings in enclosure should be guarded with suitable screen to guard against entry of rodents and reptiles.		

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	22. LIST OF FITTNGS AND ACCESSORIES: a) HV bushings # Inside HV cable box : 3 nos. b) LV bushings - Inside LV cable box : 4 nos. Outside LV cable box : 1 no. for neutral earthing. c) Winding temperature scanner connected with three nos. RTDs, one each for each LV winding, should be provided in a metallic enclosure that is mounted on the main enclosure. The scanner should provide indication, alarm & trip contacts. Winding temperature indicator should show maximum temperature attained. The RTDs should be properly wired upto the scanner terminals. Suitable hole with gland is required for control cable connecting scanner alarm/ trip contacts to HT Breaker. d) Lifting lugs. e) Earthing terminals # 2 nos. f) Jacking lugs. g) Inspection cover h) Base channels with bi-directional rollers. i) Any other accessories which bidders think essential & required as per IS may also be included. D. GENERAL TERMS AND CONDITIONS FOR TRANSFORMER 1. Party should furnish all relevant technical particulars as mentioned in Appendix #B of IS: 2026 #1977, Part-I along with the offer. Offer should also cover all points mentioned above under headings A, B & C. 2. Bidder should mention the no load losses, load losses & efficiency at 50% & 75% load (0.8 pf) on transformer with the offer. 3. The transformer will be housed inside a room with brick walls on three sides & XPM sheet wall on one side. Bidder should mention in the offer the minimum size of the room and the size of openings required for ventilation. 4. Bidder should submit with offer the list of customers to whom transformers of similar rating & type (as per NIT) have been sold during last five years. 5. Type test certificate for similar transformer should be furnished along with the offer. 6. Dimensional / drawing of similar transformer including cable box (both HV and LV), Marshalling box, etc. should be furnished along with the offer. 7. Confirmation to guarantee clause as per point no. 14 should be mentioned in the offer. 8. Offer must be complete with technical catalogue/ literature and drawings giving details as required by NIT. 9. Party should submit with offer an undertaking from the transformer manufacturer that in the event of an order on the party the transformer manufacturer will supply the transformer through the party as per specifications of the tender and order. 10. In case of an order the party should get the detail transformer drawings approved from OIL within one month of placement of order. The manufacture of the transformer should start only after approval of drawings by OIL. 11. The transformer will be offered for pre-despatch inspection and all routine tests as per IS: 11171 will be carried out in presence of OIL engineer. 12. Four sets of manufacture#s routine test certificates as mentioned in point no. 11 above should be provided to OIL#s engineer after inspection. 13. Four sets of instruction manuals for commissioning, operation and maintenance and four copies of guarantee certificate are to be supplied with		

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	transformer. 14. The transformer should be guaranteed for trouble free operation for a period of 12 months after commissioning. 15. PAYMENT: 80% of material cost shall be paid through bank against dispatch documents through bank. 20% of the balance material cost & 100% of installation, testing & commissioning charges shall be paid after successful commissioning. 16. Packing should be adequate to avoid transit damage and ingress of water.		
20 0C000161	**ANNEXURE-II** TECHNICAL SPECIFICATION OF 11KV SINGLE PANEL VCB. CUBICLE AND CIRCUIT BREAKER DETAILS Cubicle and breaker and their accessories for 11kV, indoor VCB panel should be fully factory built and assembled for direct installation. Designed, manufactured and tested in accordance with IS-13118, 14658, 2071, 3427 & IEC-60056/60298 and having following specifications. Circuit breaker & cubicle must have CPRI test certificate for design and performance as per above standards. 1.0 CUBICLE. 1.1 The horizontal drawout and horizontal isolation type circuit breaker cubicles should be fabricated using high quality sheet steel of thickness 2.5 mm as per IS. The sheet metal should be given seven tank anti corrosion treatment & then powder coated. Colour- SIEMENS GREY. 1.2 The totally metal enclosed panel shall be compartmentalised with internal positioning of insulated material of epoxy reinforced fibre glass to provide the following: a) Bus bar compartment b) Circuit Breaker Compartment. c) CT and Cable Compartment. d) Relay & Metering compartment (LT Chamber). 1.3 The L.T. chamber of suitable height shall be separated and suitably mounted on frame for ease of testing and maintenance. Auxiliary controls, protective relay and measuring equipment along with the switches and indications are to be accommodated in the L.T. chamber. Three nos. of bright steel hinges shall be used on front door with door opening limited tom 135Degree (approx). All devices in theLT box are to be marked with permanent labels. Panel rating plate shall be provided on the door. 1.4 Bus bar shall be rectangular in cross section and made from electrolytic grade electro tinned copper having 99.99% conductivity. Busbar current rating-600 Amp. Fault rating-250MVA. Heat shrinkable sleeve insulation of 11KV voltage grade should be provided on busbar and its risers. Busbar arrangement should be such that in future similar cubicles can be connected sidewise with this cubicle. 1.5 Cast epoxy insulator supports for busbar & cable termination links designed to withstand full short circuit current at specified fault level for	1	NO

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	minimum 3 seconds shall be provided. 1.6 The circuit breakers shall be mounted on horizontal draw out truck. The circuit breaker truck should have horizontal isolating system. 1.7 The front door shall have view glass to facilitate observation of mechanical ON/OFF indication and operation counter. 1.8 The draw out truck shall have the following positions a) Isolated b) Test c) Service 1.9 The CT and the incoming cable compartment shall be in the rear. The outgoing cable compartment shall be provided on the side. The LT control cable terminal arrangement shall be provided in the rear side and in a separate box so as to have isolation from high voltage terminals. All the cable entry plates shall have removable gland plates. 1.10 The CT required for metering and protection shall be as per IS-2705 & shall be sized adequately and its insulation will be epoxy cast type. Metering CT 15VA, Class-1, ratio 100-200/5. Protection CT, 15VA, Class-5P10, Ratio-100-200/5. Short time rating-13ka for minimum 3 sec. 1.11 PT shall be epoxy cast resin type & as per IS-3156. PT should be horizontal draw out type. Ratio 11kv/110V (phase to phase), 200VA & protected with HRC fuse on both HT & LT side. 1.12 Panel shall have proper protective earthing terminals for connection to external earth straps. 1.13 Earthing connection between truck and cubicle shall be provided by means of sliding contact. The truck earthing should be arranged in such a way that the truck is earthed in isolated position when inserted. While the truck is being withdrawn, the earthing connection shall not be interrupted until the truck has moved past the isolated position. 1.14 The following minimum safety interlocks shall be provided. a) The truck cannot be moved from test to service position or vice versa, when the CB is ON. b) The CB cannot be switched ON when the truck is in any position between test and service. 1.15 The following minimum safety devices shall be provided to ensure the safety of operating personnel a)Individual explosion vents for Bus bars/Breaker/Cable and CT chambers on the top of the panel to let out the gases under pressure generated during unlikely event of a fault inside the panel. b)Front door/panel sides to be pressure tested to withstand arc faults. c)CB and metal enclosure earthed in accordance with latest IS published by BIS(IS-2516, part-1, section-1) d)Self operating shutters, shielding live fixed contacts, shall be provided which closes automatically when truck is withdrawn to test position. Locking arrangement should be provided for the shutters.		

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	1.16 Control wiring and CT wiring shall be done using single core, PVC insulated, stranded copper cable of 1100V grade and 2.5 sqmm size. All cables and wires shall be numbered with suitable ferrules. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All wires shall terminate on suitable Terminal Blocks. All TBs shall have 10% spare terminals. TBs shall be marked. Reinforced flexible conduit shall be used for wiring and PVC spiral shall be provided on exposed wires near the door hinge in LT box. Colour coding of control cables shall be followed as required by ISI. Control cables shall be approved by IS-694. 1.17 Panel shall be provided with space heaters and adjustable thermostats of suitable rating along with protective HRC fuses and ON/OFF switch. 1.18 Lifting hooks shall be provided for the panels. 1.19 The switchgear panels shall have the following identification markings in a proper way in permanent manner. a) Panel name in front and rear. b) Caution and danger board in front & rear. c) CT specification name plate on CT and at panel cover at rear. d) Incoming & outgoing cable box. 1.20 Insulation system of the cubicles should withstand extreme humid condition and suitable for use under site condition mentioned in para 2.1. 2.0 PANEL EQUIPMENT AND ACCESSORIES : 1. MC type Ammeter 144 x 144 mm size, dual scale 0-100/200A for line current measurement.Accuracy- 1%.Make: AE . 2. MC type Voltmeter 144 x 144 mm size, scale 0-15kV for line Voltage measurement. Accuracy- 1%. Make: AE. 3. Ammeter Selector switch # 1 no. 4. Voltmeter Selector switch # 1 no. 5. Trip circuit check push button. 6. LED type Indication lamp for: i) CB Close, ii) CB open, iii) Trip on fault, iv) Trip circuit healthy. v) Spring charged. LEDs to be LVGP. Binay make industrial type. 7. Breaker closing and tripping switch: For closing and tripping through 110V DC closing and 110V DC shunt trip coil. 8. Control supply shall be taken from the PT through suitably rated Power Pack having following specifications: a. 110V AC input supply to the power pack shall be taken from PT output. b. 3 phase rectifier with 1200 PIV shall be used in power pack. c. Surge suppressor suitable for numeric relays shall be provided in the power pack. d. Power pack shall be protected through input HRC fuses. e. Battery shall be provided in the power pack to provide DC power for 90 minutes after incoming power failure. f. Suitable filters should be provided in the powerpack to give ripple free DC output for reliable relay operation. 9. One no. combined Numeric relay for overload, short circuit and earth fault protection of transformer. Type : Micom 121 of Alstom make. 10. Auxiliary relays for sounding alarm and tripping of VCB in case of		

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	transformer fault (Fault signal from Bucholtz Relay and oil Temp Gauge). One buzzer type alarm shall be provided in the panel. 11. Trip circuit supervisory relay- 1 No. Alstom make. 12. One set of operating handles for manual spring charging and breaker racking in/out. 2.1 Site condition : 1. a) Maximum Ambient air temperature : 40 º C b) Minimum Ambient air temperature : 2.5 º C 2. Maximum humidity at site (at 40 º C) : 95 % 3. Surrounding atmospheric condition : Humid. Average rainfall- 250cm annually. 4.Site altitude : 150 mtr. 3.0 CIRCUIT BREAKER: The breaker used shall be three pole VACUUM CIRCUIT BREAKER having the following features: a. Draw out type with Horizontal Isolation mounted on truck with rollers. b. Truck cover with two handles and fixed to truck frame with four screws. c. Truck earthing with welded boss. d. Insulation bushings shall be epoxy cast resin type and suitable for ambient conditions mentioned in para 2.1. e. Bushings shall have suitable silver coated, flower contacts for firm connection. f. Manual & motor operated spring charging system. g. 11kV, Three pole, 600A continuous rating, 250MVA fault level. h. Auxiliary contacts (6 NO + 6NC). i. Operation counter of 5 digits. j. High mechanical endurance of 50,000 (minimum) operations. k. Mechanical ON/OFF indication. l. Spring FREE/ CHARGED indication. m. Position indicator # SERVICE/ TEST/ ISOLATE. n. Low maintenance. o. Manual ON and TRIP button. p. Operating sequence: O #0.3 min # CO # 3 min # CO. q. Shunt trip coil, closing coil: 110v DC rated. 4.0 CABLE TERMINAL BOX: HT cable boxes with termination links for termination of incoming and outgoing HT cables should be provided in the rear and side of the unit. Rear incoming cable box should be of suitable size for safe entry of two nos. of incoming cables and should have suitable terminal links for safe termination of both the incoming cables for loop in/ loop out connection as is done in case of ring main unit. The termination arrangement should be such that it should be possible to disconnect one cable in the event of fault in that cable and power-up the unit with the other incoming cable. Link rating 400amp(min). One no. outgoing cable will be terminated in the cable box mounted on side. Size for incoming and outgoing cables, 3 x 240sq. mm, 11kV grade, XLPE		

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	insulated, PVC sheathed, Aluminium Conductor, Armoured cable. Suitable nos. of detachable gland plates with suitable size of heavy duty cable glands shall be provided in the bottom entry plates of both the cable boxes. Separate gland plates shall be provided for both the incoming cables in the incoming cable box. Rear entry LT cable termination box with suitable single compression cable glands for heater supply cable and control cable from transformer marshalling box should be provided. 5.0 MAKE: Alstom, Crompton Greaves, Siemens, ABB. 6.0 GENERAL NOTES FOR HT PANEL 1. The following documents are required to be submitted with the offer. a. Detail as per specification mentioned above. Specific comment against each point is required. b. Copy of report of type tests done on similar panel & VCB at CPRI. c. General arrangement drawing of the panel. d. Guarantee confirmation as per point no. 5 of general notes for HT panel. e. An undertaking from the panel manufacturer stating that in the event of an order on the party the panel manufacturer will supply the panel through the party as per specifications of the tender and order. 2. Detail foundation drawing, drawing of panel with detail of HT and LT cable boxes showing termination details, wiring diagram and complete bill of material must be submitted to OIL for approval within 30 days after placement of the order. The manufacture of panel should start after approval of the drawings by OIL. 3. Following documents are to be supplied with the panel: a. Four sets of installation, commissioning & operation manual of the Panel and Vacuum Circuit Breaker (VCB). b. Four sets of literature of main components like protection & auxiliary relays, powerpack. c. Four copies of general arrangement, schematic diagram and wiring diagrams. d. Two copies of foundation drawings. e. Four sets of test report containing result of tests done at manufacture#s work during inspection. f. Four copies of Guarantee certificate duly signed by the party. g. Recommended list of spares with part no. & price for maintenance of panel. 4. TEST AND INSPECTION: To be witnessed by OIL#s representative at manufacturer#s works before despatch. (i) The equipment shall be routine tested as per relevant IS and IEC standards at manufacturer#s works. (ii) Primary & secondary injection test for relay in accordance with IS shall be carried out at the manufacturers works during inspection. (iii) Polarity Test for PT. 5. GUARANTEE: The panel and breaker must be guaranteed with all its components for a period of 12 months after commissioning. Party will arrange		

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	for repair/ replacement, as required by OIL, of defective parts within one month of reporting of the failure by OIL. 6. PAYMENT: 80% of material cost shall be paid through bank against dispatch documents through bank. 20% of the balance material cost & 100% of installation, testing & commissioning charges shall be paid after successful commissioning of the panel. 7. Material should be adequately packed to avoid damage and ingress of water during transit.		
30 0C000161	**ANNEXURE-III** SPECIFICATION FOR L.T. CFS BOARD. Self supporting, indoor and industrial type, dust and vermin proof, floor mounting CFS Board complete with floor stands, suitable for operation from front side. Bus chamber to be made of 2.0mm CRCA sheets and built upon suitably sized angle iron frame work on channel iron section with Danger Plate fitted on both sides. The entire framework & the sheet-work shall be given seven tank anti-rust treatment as per IS before powder coating. All the outgoing switches should be mounted on framework & suitably connected to busbar. The design should be as per IS-8623, 13947,13703, 4237. Protection as per IP-54. Ambient-40°C (Max)/ 5°C (Min), Humidity-95% (Max). All components used must be suitable for the environment as mentioned. All hardwares should be of high tensile steel & Galvanised/ Zinc passivated. Size of spring washers & flat washers should be as per relevant IS for individual bolt. A. BUS CHAMBER Sheet steel clad Bus Chamber having front and rear bolted covers with a set of TP&N IACS (International Annealed Copper Standard) 99.99% conductivity, rectangular section, tinned copper bus bars, conforming to IS & rated for 4000 Amps for individual phases and supported at required intervals to withstand max. short circuit fault levels of 50kA. The bus bars shall be insulated with heat shrink PVC sleeve and supported on SMC supports. Neutral bar rating should not be less than 50% of the phase bus rating. Busbar should be extendible type to facilitate addition of cubicles and switches in future. B. INCOMING FEEDER WITH ASSOCIATED INSTRUMENTS. INCOMER: Two Nos.2000A, 415V(Ue), 600V(Ui), panel mounted, draw out type, Four pole Air Circuit Breaker of 50kA (Ics) breaking capacity, confirming to IS-13947, IEC-60947, Mechanically interlocked & each having the following features: Make: GEPC/ Merlin Gerin /L&T/ Siemens. Similar to M-pact with CTZM 71 of GEPC. 1. Electrical closing coil, shunt tripping coil. Mechanical ON/OFF buttons. Manual and electrical spring charging mechanism. Spring charge indicator. 2. All control accessories accessible from the front. 3. Rear terminals connected to brought out links for cable termination. 4. Safety shutters. 5. Phase barriers and Mechanical interlock for both breakers. 6. Inbuilt solid state, combined O/C, S/C and E/F protection with adjustable current & time setting for each protection. Breaker should have indications for	1	NO

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	type of fault. In case type of fault is not indicated on the breaker suitable indication for type of fault shall be provided in the panel cover. The fault indication system should not be self resetting type & should have manually operated reset button. Supply for fault indication system should be taken from incoming terminals of breaker to keep the indications powered-up after breaker tripping. 7. Suitable arrangement of brought out links in cable chamber box complete with single compression cable glands on a detachable gland plate for 8 Nos. 3.5 core x 240 sq. mm PVCA Copper/ Aluminium Cable should be provided. The size of terminating links should be large enough for termination of each cable separately. 8. Panel mounted M.C. Voltmeter, 0-500 volts (AE Make) with voltmeter selector switch (Kaycee/ L&T-Salzer make) and 3 Nos. HRC Instrument Fuses (GE Power Controls make). Accuracy- 0.5% 9. Panel mounted M.C. Ammeter, 0-2000 Amps (AE make) with Ammeter Selector Switch (Kaycee/ L&T-Salzer make) and 3 Nos. CTs (Kappa/GE make). Accuracy-0.5%. 10. Indicating Lamps to indicate Breaker #ON/OFF/TRIP# & Supply ON. LED type lamps of Binay make. 11. The panel builder will conduct current injection test on the breakers at the time of inspection of the panel. C. OUTGOING FEEDERS & INSTRUMENTS- Mounted on top & bottom of bus chamber & as per following details. 1. One No.1000A, 415V(Ue), 600V(Ui), panel mounted, draw out type, Four pole Air Circuit Breaker of 50kA (Ics) breaking capacity, confirming to IS-13947, IEC-60947 & having the following features: Make: GEPC/ Merlin Gerin /L&T/ Siemens. Similar to M-pact with CTZM 71 of GEPC. (i) Electrical closing, shunt tripping coil. Mechanical ON/OFF buttons. Manual and electrical spring charging mechanism. Spring charge indicator. (ii) All control accessories accessible from the front. (iii) Rear terminals connected to brought out links for cable termination. (iv) Safety shutters. (v) Phase barriers. (vi) Inbuilt solid state, combined O/C, S/C and E/F protection with adjustable current & time setting for each protection. Breaker should have indications for type of fault. In case type of fault is not indicated on the breaker suitable indication for type of fault shall be provided on the panel cover. The fault indication system should not be self resetting type & should have reset button. Supply for fault indication system should be taken from the incoming terminals of breaker to keep the indications powered-up after breaker tripping. (vii) Suitable arrangement of brought out links in cable chamber box complete with compression cable glands on a detachable gland plate for 3 Nos. 3.5 core x 240 sq. mm PVCA Copper/ Aluminium Cable. (viii) Panel mounted M.C. Ammeter, 0-1000 Amps (AE make) with Ammeter Selector Switch (Kaycee/ L&T-Salzer make) and 3 Nos. CTs (Kappa/GE make). Accuracy-0.5%. (ix) Indicating Lamps to indicate Breaker #ON/OFF/TRIP#. LED type lamps of Binay make. (x) The panel builder will conduct current injection test on the breakers at the time of inspection of the panel.		

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	2. Five Nos. 315 Amps FP Combination Fuse Switch Units, fitted with one no. 0-300amp meter and 200amp HRC fuses, housed in CI enclosure. The Unit shall be provided with a cable end box complete with a single compression cable gland on a detachable gland plate suitable for one no.3.5 core x 240 sq. mm PVCA Aluminium cable. Size of the detachable gland plate shall be suitable for fixing two nos. of cable glands. Neutral & phase links shall be available inside the cable box. Neutral link rating should not be less than 50% of the phase bar rating. Switch as per IS-13947. AC-22 duty. Make GEPC 3. Two Nos. 750 Amps, FP Combination Fuse Switch units, each fitted with one no. 0-750 amp meter and 600 amp HRC fuses, housed in metallic enclosure. The Unit shall be provided with a cable end box complete with a single compression cable gland on a detachable gland plate suitable for three nos. 3.5 core x 240 sq. mm PVCA aluminum cable. Neutral & phase links shall be available inside the cable box. Neutral link rating should not be less than 50% of the phase bar rating. Switch as per IS-13947. AC-22 duty. Make GEPC 4. Two Nos. 100 Amps TPN Combination Fuse Switch Units, fitted with one no. 0-100amp meter and 100amp HRC fuses, housed in CI enclosure. The Unit shall be provided with a cable end box complete with a single compression cable gland on a detachable gland plate suitable for one no.3.5 core x 50 sq. mm PVCA Aluminium cable. Size of the detachable gland plate shall be suitable for fixing two nos. of cable glands. Neutral & phase links shall be available inside the cable box. Neutral link rating should not be less than 50% of the phase bar rating. Switch as per IS-13947. AC-22 duty. Make GEPC 5. All the outgoing feeders should have CT operated Panel mounted M.C. Ammeter, (AE make) with Ammeter Selector Switch (Kaycee/ L&T-Salzer make) and 3 Nos. CTs (Kappa/GE make). Accuracy-0.5%. CT make (Kappa/GEPC), accuracy class-1. 6. Suitable padlocking arrangement is to be provided in each outgoing feeders in OFF position. 7. Provision for feeder identification label /pocket is to be provided in each out-going feeder. 8. The outgoing switches mounted on the top of busbar chamber should have reverse entry type cable boxes. D. FEATURES OF THE PANEL: 1. The frame of the CFS Board shall be sufficiently strong and made of minimum 75 x 75 x 8mm MS angle iron/ channels as required with intermediate members of suitable section and size at bottom channel shall be provided.The panel doors shall have door latches suitable for laching in one turn only. 2. THE PANEL WILL BE TRANSFERRED TO SITE AND PLACED INSIDE THE SUBSTATION IN TWO PARTS. THE FINAL UNITISATION OF THE PARTS WILL BE DONE BY THE PARTY AFTER INSTALLATION INSIDE THE LT ROOM. 3. Special non-deteriorating Neoprene rubber gaskets between all joints shall be provided. 4. The tinned copper bus bars rated at 4000 Amps shall be air insulated and PVC sleeved and supported on SMC supports. 5. Adequate insulated barriers between the bus chamber and feeder shall be provided to achieve FORM-2 SEPARATION AS PER IEC 439-1.		

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	6. All main riser connections & brought out links shall be done by suitably sized links as recommended by the switch manufacturer. Current rating of riser connections & links shall be minimum 1.5 times the switch rating. 7. NO BIMETALLIC JOINTS SHALL BE PERMITTED IN THE LINKS & RISER CONNECTIONS (BIDDER TO CONFIRM THE SAME WITH TECHNICAL BACK-UP IN THEIR QUOTATION). 8. Control wiring shall be done with 1.5 sq. mm PVC insulated, flexible copper cable of 1100V grade. Control wires should have ferrule numbers. CT wiring should be done with 2.5 sq. mm PVC insulated, flexible copper cable of 1100V grade. ISI approved Cables shall be used for control & CT wiring. Suitable lugs shall be used for control wiring and ring type lugs shall be used for CT wiring. All control & CT wiring should be terminated on suitable TBs. 9. Brought out solid links, duly supported should be provided for all incoming and outgoing feeders. 10. ALL THE HARDWARES SHOULD BE OF HIGH TENSILE STELL DULY PASSIVATED FOR COROSSION PROTECTION & FITTED WITH PROPER SIZED HEAVY DUTY SPRING WASHER & TWO NOS HEAVY DUTY FLAT WASHERS. 11. Sufficient space should be provided for proper glanding, dressing, connecting up and maintenance of cables. Adequate space should be provided for connecting the cable leads to the brought out terminals. 12. A 2x50 x 6mm GI strip should be mounted on an angle iron with adequate holes (15mm dia) each provided with nut bolts and washers for making earth connections. 13. Suitable cable saddles should be provided at the rear of the CFS Board to firmly grip the cables connected to the outgoing feeders. 14. Works Test Certificate for routine tests as per IS-8623, 5039, 12063 (with calibrated testing equipment) and wiring diagrams should be provided along with the Equipment. Test certificate of incomer breaker is also required. 15.Wiring cables from panel to door shall be protected with heavy duty PVC spiral binding. 16. All panel components and door shall be earthed with copper flexible loops/ braids as per IS-3043. 17. The board should be properly packed to avoid ingress of rain water/ moisture and damage during the transit. 18. The CFS board should be guaranteed for 12 months from the date of commissioning. 19. All items of the offered CFS board must be approved by ISI (with latest amendments). 20. PAYMENT: 80% of material cost shall be paid through bank against dispatch documents through bank. 20% of the balance material cost & 100% of installation, testing & commissioning charges shall be paid after successful commissioning of the panel. E. MAKE: Assam Electricals Panitola, PCE Projects Kolkata, Key Electricals Kolkata, Lotus Power and control Bangalore, L&T, Siemens. F. GENERAL NOTES FOR LT PANEL: 1. The following documents are required to be submitted with the offer. (i) Detail with drawings as per specification mentioned above. Specific comment against each point is required. (ii) Copy of CPRI test certificate for busbar fault level of 50kA.		

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Item No./ Mat. Code	Material Description	Quantity	UOM
	(iii) Guarantee confirmation as per point no. 4 of general notes of LT panel. (iv) Undertaking from the panel manufacturer that in the event of an order on the party the panel manufacturer will supply the panel through the party as per specifications of the tender and order. 2. Detail foundation drawing, drawing of panel showing termination details, wiring diagram and complete bill of material must be submitted to OIL for approval within 30 days after placement of the order. The manufacture of panel should start after approval of the drawings by OIL. 3. Following items, drawings and literatures are to be supplied with the panel: (i) Four sets of operation, installation, commissioning manual of the switches and Circuit Breaker (ACB). (ii) Four copies of general arrangement, schematic diagram and wiring diagrams. (iii) Two copies of foundation drawings. (iv) Four sets of test report containing result of tests done at manufacture#s work during inspection. (v) Four copies of Guarantee certificate duly signed by the party. (vi) One set of operating handles for manual spring charging & breaker racking in/out for each breaker. 4. GUARANTEE: The panel and breaker must be guaranteed with all its components for a period of 12 months after commissioning. Party will arrange for repair/ replacement, as required by OIL, of defective parts within one month of reporting of the failure by OIL. 5. PAYMENT: 80% of material cost shall be paid through bank against dispatch documents through bank. 20% of the material cost & 100% of installation, testing & commissioning charges shall be paid after successful commissioning of the panel. 6. TEST AND INSPECTION: To be witnessed by OIL#s representative at manufacturer#s works before dispatch as per following details. (i) The equipment shall be routine tested as per relevant IS and IEC at manufacturer#s work. (ii) Primary injection test for Breakers in accordance with ISI shall be carried out at the panel manufacturer works during inspection. 7. Material should be adequately packed to avoid damage and ingress of water during transit.		
40 0C000161	**ANNEXURE-IV** SPECIFICATION OF 11KV HT CABLE 11KV Cable, in single length of 700 mtr, stranded compact Aluminium conductor as per IS-8130, individual core screened with extruded semi conducting compound, cross linked polyethylene (XLPE) insulated, extruded semi conducting compound insulation, semi conducting tape and then copper tape metallic screening, core identification tape, core laying up with Polymeric fillers, inner PVC compound sheath (bedding), galvanized steel strip armoured and overall PVC sheathed as per IS-5831 and confirming to IS -7098. Cable should have following features/specifications.	1	NO

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	1. Size: 3 core x 240 Sq.mm.Length- 700mtr in single length and single and single drum. 2. Voltage Grade: 11KV, suitable for solidly earthed neutral system. 3. Each core should be identified by numbers printed or by colour code. 4. The cable shall be ISI certified as per IS: 7098 (Part-II) (with latest amendment). 5. CABLE SHOULD BE DELIVERED AT SITE IN A SINGLE LENGTH OF 700 METER IN A STRONG NON RETURNABLE METALLIC DRUM AND SUITABLY PROTECTED TO AVOID TRANSIT DAMAGE. 6. Sufficient quantity of filler material should be used to give an overall circular shape to cable. 7. Manufacturer#s name, Voltage grade, Size, year of manufacture must be embossed on the outer sheath of the cable at regular intervals as mentioned is IS-7098 (Part-II). Cable outer sheath should be marked with cable length at every 1 meter for measurement of cable. 8. Cable drum should also be marked with Manufacturer#s name, voltage grade, size, ISI mark, year of manufacture and P.O. No. with suitable paint of permanent type. 9. Four sets of routine test certificates as per IS: 7098 (Part-II)-1985 for tests done at manufacturer#s works should be sent along with the cable. OIL will witness the routine test of the cable at the manufacturer#s works and the cable can be dispatched after clearance from OIL. 10. Make: CCI/ NICCO/RPG/Universal Cables. General Notes for HT Cable: 1. Offer should be complete with full technical details as above, fault level withstand capability with time for cable, catalogue, copy of ISI certification for similar cable. Specific comment against each point is required. 2. Confirmation to guarantee clause as per point no. 6 of notes for HT cable should be mentioned in the offer. 3. Party should submit with offer an undertaking from the cable manufacturer that in the event of an order on the party the cable manufacturer will supply the cable through the party as per specifications of the tender and order. 4. OIL shall inspect the cable at manufacturer#s works and all the routine & acceptance tests as per IS shall be carried out in presence of OIL#s representative. 5. Four copies of report of test during inspection and four copies of Guarantee certificate duly signed and stamped by the manufacturer should be sent with the cable. 6. The cable should be guaranteed for 12 months from the date of commissioning. 7. PAYMENT: 80% of cable cost shall be paid through bank against dispatch documents through bank. 20% of the balance cable cost & 100% of installation, testing & commissioning charges shall be paid after successful commissioning.		

Special Notes : 1. To evaluate the inter-se ranking of the offers, Assam Entry Tax on purchase value will be loaded as per prevailing Government of Assam Guidelines as applicable on bid closing date. Bidders may check this with the appropriate authority while submitting their bids.
2. The entire work of supply, installation and commissioning of all equipment as mentioned in the

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tender document must be completed by the party as per terms of tender by 10.09.2007.

3. All items shall be supplied, installed and commissioned by one party only as per specifications mentioned in the tender. The offer will not be acceptable if the party do not quote for all items of the tender and supply, installation, commissioning of all items and cables.

4. In their offer the party must mention their detailed comments point-wise against each point of tender specifications. Any deviation from the tender specification will be specifically mentioned. Specific type and make of equipment should be mentioned. All the information required as per tender specifications must be submitted.

5. Party must enclose with the offer an undertaking from respective equipment/ cable manufacturer confirming that in the event of an order on the bidder the equipment/cable supplied by them through the bidder will fully meet all the points of the tender and order against each item.

6. In case of an order the complete tender specification shall be mentioned in the order. However, deviations from tender specifications, as mentioned by party in their offer and subject to acceptance by OIL shall be mentioned in the order.

7. In the event of an order the party will submit to OIL within one month of placement of order all documents as required against each item.

8. The manufacture of the equipment is to be started only after written approval of the drawings/ documents by OIL as mentioned in tender against each item.

9. In case the documents furnished by the bidder as per point no. 7 above do not comply with any of the points mentioned in the order then the order will be cancelled without any obligation on part of OIL. IN CASE OF SUCH CANCELLATION OIL WILL RECOVER FROM THE PARTY THE COST INCURRED BY OIL IN PROCESSING THE TENDER TILL THE TIME OF CANCELLATION.

10. Party must have experience in supply, installation of HT electrical equipment, similar to those mentioned in the tender, in PSUs, Govt Depts and Railway. Detail of such supply, installation work for HT equipment done during last five years with order details and completion certificates must be submitted with the offer.

11. Total value of supply, installation work for equipment as per point no.10 above during last five years must be above 50 lacs. Suitable documentary evidence is required with the offer.

12. Party must have valid electrical contractor license and the copy of the valid contractor license is required with the offer.

13. List of skilled electricians, jointers with copy of valid license must be submitted with the offer.

14. Party will provide with the offer the list of tools and equipment available with the bidder to carryout the installation and commissioning work as per tender.

15. Party will be responsible for safety of its personnel and safety of all the equipment. All the safety gadgets required for safely carrying out the job shall be provided by the party.

16. Party will be responsible for safe custody of all the items before handing over to OIL.

17. Handing over to OIL means supply, installation and commissioning of all items as per order and submission of all the documents and drawings as per order. Balance 20% of material cost and 100% commissioning charges (refer payment terms) shall be paid to the party after final handing over to OIL.

18. The party to strictly ensure that all the cut ends of cables, packing materials, leftover items are removed from site after completion of work.

19. The cable trench area shall be neatly dressed after laying of all cables.

20. No environmental damage at site shall be done while carrying out the job. Any damage done during the execution of work must be corrected by the party at their own cost.

21. All the test reports must be signed by licensed electricians, jointers and supervisors who have carried out the installation and commissioning work as per order.

22. In case party is not able to commission any item due to whatsoever reasons then the balance 20% of material cost and 100% commissioning charges shall not be paid to the party.