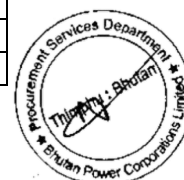


LOT 1: INDOOR VCB PANEL

| GUARANTEED TECHNICAL PARTICULARS OF 11 kV,630 A INDOOR VCB SWITCHBOARD | | | |
|-------------------------------------------------------------------------------|---------------------------------------------------------------|-------------|--------------------------------------------|
| SL# | Parameters | Unit | Particulars to be filled up bidders |
| A | General | | |
| 1 | Name of manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Short-time current withstand and time | kA/sec | |
| 4 | Dynamic rating | kAp | |
| 5 | Rated Voltage | kV | |
| 6 | Clearances | | |
| a) | Phase to phase | mm | |
| b) | Between live parts and earth | mm | |
| 7 | Rated short duration power frequency withstand voltage | kV | |
| 8 | Thickness of sheet steel (hot or cold rolled) | | |
| a) | Frame | mm | |
| b) | Door | mm | |
| c) | Covers | mm | |
| 9 | Dimensions (W x D x H) | | |
| a) | Circuit breaker cubicle | mm | |
| b) | Cable/VT cubicle | mm | |
| 10 | Drawout space required in front | mm | |
| 11 | Clear space required at the rear | mm | |
| 12 | Total weight of cubicle | | |
| | | | |
| B | Circuit Breaker | | |
| 1 | Name of Manufacturer | | |
| 2 | Type of breaker | Vacuum/SF6 | |
| 3 | Rated current inside cubicle under site conditions | A | |
| 4 | Rated short-circuit breaking current | kA | |
| 5 | Impulse withstand voltage | kVp | |
| 6 | One minute power frequency withstand voltage | kV | |
| 7 | Rated operating duty | | |
| 8 | Time rate of contact travel | | |
| a) | On closing | m/sec | |
| b) | On tripping | m/sec | |
| 9 | Type of contacts | | |
| 10 | Material of contacts | | |
| 11 | Rated line-charging breaking current | A | |
| 12 | Type and material of interphase barriers | | |
| 13 | Method of tripping | | |
| a) | Normal | | |
| b) | Emergency | | |
| 14 | Type of closing mechanism | | |
| 15 | Normal voltage of closing mechanism | V | |
| 16 | Power required to operate closing mechanism at normal voltage | W | |
| 17 | Type of tripping mechanism | | |
| 18 | Normal voltage of tripping mechanism | V | |
| 19 | Power consumption of trip coil | W | |
| 20 | Spring charging motor details | | |
| a) | Output rating | kW | |
| b) | Rated voltage | V | |
| c) | Class of insulation | | |
| d) | Spring charging time | Sec. | |
| 21 | Applicable standards | | |
| | | | |



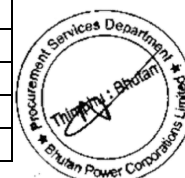
LOT 1: INDOOR VCB PANEL

| GUARANTEED TECHNICAL PARTICULARS OF 11 kV,630 A INDOOR VCB SWITCHBOARD | | | |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------|--|
| C | Bus Bars | | |
| 1 | Material | | |
| 2 | Cross section | mm x mm | |
| 3 | Type of insulation | | |
| 4 | Minimum clearance | | |
| a) | Between phases | mm | |
| b) | Phase to earth | mm | |
| 5 | Continuous current rating | A | |
| 6 | Short-time current rating (1 sec.) | kA | |
| 7 | Temperature rise over design ambient temperature | °C | |
| | | | |
| D | Current Transformers | | |
| 1 | Name of manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Class of insulation | | |
| 4 | Temperature rise of winding over design specified ambient | °C | |
| 5 | Impulse withstand voltage | kVp | |
| 6 | One minute power frequency withstand voltage | kV | |
| 7 | Rated short-time current withstand (1 sec) | kA | |
| 8 | Whether ratio, taps, burdens, accuracies etc. are as per enclosed drawings | Yes/No | |
| 9 | Rated extended primary current | % | |
| | | | |
| E | Voltage Transformers | | |
| 1 | Name of manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Overvoltage factor | | |
| 4 | Class of insulation | | |
| 5 | Temperature rise of winding over design ambient temperature | °C | |
| 6 | One minute power frequency withstand voltage | kV | |
| 7 | Impulse withstand voltage | kVp | |
| 8 | Whether ratio, burdens, accuracies etc. are as per enclosed drawings | Yes/No | |
| | | | |
| F. | Relays Provided in the Breaker | | |
| 1 | Name & Country of Manufacturer. | | |
| 2 | Required Auxiliary Power supply | ± V AC/DC | |
| 3 | Standards to which the relays conform. | | |
| 4 | All tests as specified shall be carried out. | Yes / No | |
| 5 | Operating temperature range | ± °C | |
| 6 | Tropicalisation provided | Yes / No | |
| 7 | All auxiliary relays required with main protection relay schemes included. | Yes / No | |



LOT 1: INDOOR VCB PANEL

| GUARANTEED TECHNICAL PARTICULARS OF 11 kV,630 A INDOOR VCB SWITCHBOARD | | | |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------|--|
| 8 | Minimum rating of contacts for auxiliary and output relays : | | |
| | (a) Voltage | V, DC | |
| | (b) Continuous current | A, DC | |
| | (c) Make & carry for 1 sec. | A, DC | |
| | (d) Breaking capacity (i) Resistive | Watts | |
| | (ii) Inductive | W | |
| 9 | Auxiliary CT / VT provided for input to all static relays and wherever required for electro-magnetic relays. | Yes / No | |
| 10 | Protection of the Relay: Over current, Earth fault and other protection | | |
| a) | 50 - Definite time overcurrent protection | Yes / No | |
| b) | 51- Inverse time overcurrent protection | Yes / No | |
| c) | 67 - Three phase directional overcurrent | Yes / No | |
| d) | 49 - Thermal overload | Yes / No | |
| e) | 37 - Three phase undercurrent | Yes / No | |
| f) | 46 - Negative sequence overcurrent | Yes / No | |
| g) | 50N - Earthfault protection | Yes / No | |
| h) | 51N - IDMTL earth-fault | Yes / No | |
| i) | 50BF - Circuit breaker failure detection | Yes / No | |
| j) | 46BC - Broken conductor detection I2/I1 | Yes / No | |
| k) | 86 - Output relay latching | Yes / No | |
| 11 | Transformer Differential Unit | | |
| 11.1 | (a) Manufacturer's type / designation | | |
| | (b) Numerical/Static/Electromagnetic | | |
| 11.2 | Rated current or (&) Voltage | | |
| 11.3 | (a) Operating principles | | |
| | (b) Literature / Write-up enclosed | Yes / No | |
| 11.4 | Protection of Relays | | |
| a) | 87 - High Impedence three phase differential protection | Yes / No | |
| b) | 87G - Restricted earth fault protection | Yes / No | |
| c) | 50 - Definite time overcurrent protection | Yes / No | |
| d) | 51- Inverse time overcurrent protection | Yes / No | |
| e) | 49 - Thermal over load protection | Yes / No | |
| f) | 59 - Over voltage Protection | Yes / No | |
| g) | 27 - under voltage Protection | Yes / No | |
| h) | 81 - Under frequency protection | Yes / No | |
| 12 | Tripping Relays | | |
| 12.1 | (a) Manufacturer's type / designation | | |
| | (b) Static / Electromagnetic | | |
| 12.2 | Rated voltage | V, DC | |
| 12.3 | (a) Operating Principles | | |
| | (b) Literature / Write-up enclosed. | Yes / No | |
| 12.4 | Adequate no. of relays provided to complete the scheme | Yes / No | |
| 13 | Trip Circuit Supervision Relays | | |
| 13.1 | (a) Manufacturer's type / designation | | |
| | (b) Static or Electromagnetic | | |
| 13.2 | Rated voltage | V, DC | |
| 13.3 | (a) Operating principles | | |
| | (b) Literature / Write-up enclosed | Yes / No | |
| 13.4 | Monitoring of breaker trip coil in both close & open position provided | Yes / No | |
| 13.5 | Safety resistors provided to limit the current if the relay coil is short-circuited | Yes / No | |
| 14 | Indicating Lamps | | |
| 14.1 | Type | | |
| 14.2 | Ratings | | |
| | (a) Voltage | V | |
| | (b) Wattage | W | |
| 14.3 | Series resistors are provided | Yes / No | |
| 14.4 | Series resistors - ohms | | |
| | - W | | |
| 14.5 | Life of lamp in burning hours | Hrs. | |



LOT 1: INDOOR VCB PANEL

| GUARANTEED TECHNICAL PARTICULARS OF 11 kV,630 A INDOOR VCB SWITCHBOARD | | | |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------|--|
| 15 | Annunciators | | |
| 15.1 | Make | | |
| 15.2 | Dimensions of each window (L x W x H) | Mm | |
| 15.3 | No. of lamps per window | | |
| 15.4 | Lamps - V | | |
| | - W | | |
| 15.5 | Initiating contact requirements | | |
| | (a) Making current | A | |
| | (b) Impulse duration | ms | |
| 16 | Indicating Meters | | |
| 16.1 | Make | | |
| 16.2 | Type of movement | | |
| 16.3 | Type designation | | |
| 16.4 | CT / VT sec. current / Volt | A, V | |
| 16.5 | Burden : | | |
| | (a) Current coil | VA | |
| | (b) Voltage coil | VA | |
| 16.6 | Details of shunt, if any | | |
| | (a) Rated current | A | |
| | (b) Rated voltage drop | V | |
| 16.7 | Accuracy class & standard. | | |
| 16.8 | Total deflection angle | Degrees | |
| 16.9 | Total scale length | mm | |
| 16.1 | Suitable for specified reference operating conditions | Yes / No | |
| 17 | Multifunction meter | | |
| 17.1 | Make | | |
| 17.2 | Type of measurement (3 phase, 3 wire unbalanced power / 3 phase, 4 wire unbalanced power) | | |
| 17.3 | Measuring range in primary watts. | | |
| a) | CT ratio | A/A | |
| b) | VT ratio | V/V | |
| 17.4 | Accuracy and standard to which meter conforms : | | |
| 17.5 | Burden | | |
| | (a) Current coil | VA | |
| | (b) Voltage coil | VA | |
| 17.6 | No. of digits in the meter | | |
| 17.7 | Impulse contact for remote summation or printing provided or connectivity with the plant computer provided | | |
| 17.8 | Details of impulse contacts | | |
| | (a) Impulse frequency | No. per sec. | |
| | (b) Duration | ms | |
| | (c) Contact rating | W,V | |
| 17.9 | Mounting details | | |



**LOT 2: GUARANTEED TECHNICAL PARTICULARS
ACDB**

| SL# | Description | Unit | To be filled up by Bidders |
|----------|------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------|
| 1 | Name of Manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Type of mounting | | |
| 2 | Rated voltage, Phase and Frequency | V, Ph, HZ | |
| 3 | Type of switchboard (brief Description) | | |
| 4 | One minute Power Frequency withstand voltage | | |
| a) | Power circuit | kV (rms) | |
| b) | Control circuit | kV (rms) | |
| 5 | Continuous current rating of busbars under design ambient of 30 degree celcius | Amps | |
| 6 | Short circuit withstand for busbars and droppers (1 sec) | kA | |
| 7 | Max. temperature of busbars, droper and contacts at continuous current rating over design ambient temperature of 40 degree Celsius | Deg. Celsius | |
| 8 | Thickness of sheet steel in mm cold rolled (frame/Enclosure/Covers) | mm | |
| 9 | Degree of protection of enclosure | - | |
| 10 | Type of paint | | |
| 11 | Finish colour Shade | - | |
| a) | Interior & Exterior | | |
| 12 | Earthing Bus | | |
| a) | Material | - | |
| b) | Size | mm | |
| 13 | Cable entry | - | |
| B | Bus bar | | |
| 1 | Material | - | |
| 2 | Continuous current rating under design ambient temperature | Amps | |
| C | MCCB/MCB | | |
| 1 | Type | | |
| 2 | Rated voltage | V | |
| 3 | No. of poles | | |
| 4 | Short circuit breaking capacity | kA | |
| D | Auxiliary contactor | | |
| 1 | Rated voltage of coil | V | |
| 2 | Utilization category | - | |
| E | Number of Incomer | | |
| 1 | MCCB 125 A TP 35 kA with over current and earth fault protection | Nos | |
| F | Number of outgoing MCB, 10 kA | | |
| | 4 pole | | |
| | 63 A | Nos | |
| | 32 A | Nos | |
| | 2 pole | | |
| | 32 A | Nos | |
| | 16 A | Nos | |



**Lot 2: GUARANTEED TECHNICAL PARTICULARS
BATTERY BANK**

| SL# | Description | Unit | To be filled up by Bidders |
|-----|------------------------------------------------------|---------|----------------------------|
| 1 | Name of Manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Battery type | | |
| 4 | Rated voltage per cell | V | |
| 5 | Rated voltage of the battery | V | |
| 6 | Capacity at 10 hour rate of discharge at 27°C | | |
| | Initial | AH | |
| | Rated | AH | |
| | End of life | AH | |
| 7 | Type of positive plates | | |
| 8 | Battery capacity at following rates of discharge : | | |
| | 1 minute | AH | |
| | 1 hour | AH | |
| | 2 hours | AH | |
| 9 | Maximum momentary current | A | |
| 10 | Float charging voltage per cell | V | |
| 11 | Float charging current | A | |
| 12 | Boost charging voltage per cell | V | |
| 13 | Boost charging current | A | |
| 14 | Maximum time for boost charging | minutes | |
| 15 | Cell type | | |
| 16 | Container type | | |
| 17 | Overall dimensions of cell L x B x H) | mm | |
| 18 | Overall dimension of the battery (L x B x H) | mm | |
| 19 | Single/ Double tier | | |
| 20 | Weight of complete battery | kg | |
| 22 | Expected life of battery | hours | |



**GUARANTEED TECHNICAL PARTICULARS OF
BATTERY CHARGER**

| SL# | Description | Unit | To be filled up Bidders |
|-----|-----------------------------------------------------------------------------|--------|-------------------------|
| 1 | Name of manufacturer and country | | |
| 2 | Applicable Standards | | |
| 3 | Rated voltage | V | |
| 4 | Rated output | kW | |
| 5 | Overload capacity after operation for 10 hours at rated load | | |
| | For 1 minute | A | |
| | For 2 hours | A | |
| 6 | Maximum charging current, battery charger is capable for | | |
| | Float charging | A | |
| | Boost charging | A | |
| 7 | Boost charging voltage range | V | |
| 8 | Float charging voltage range | V | |
| 9 | Voltage regulation | % | |
| 10 | Charger efficiency at | | |
| | Rated load | % | |
| | 50% load | % | |
| 11 | Power factor at | | |
| | Rated load | % | |
| | 50% load | % | |
| 12 | Ripple Content at rated load | | |
| | with battery connected | % | |
| | without battery connected | % | |
| 13 | Dimensions of battery charger (L x B x H) | mm | |
| 14 | Total weight | kg | |
| 15 | Degree of protection of enclosure | | |
| 16 | Colour Finish shade of Panel | | |
| | Interior | | |
| | Exterior | | |
| 17 | Type and thickness of sheet steel (hot / cold rolled) Frame / Door / Covers | - / mm | |



LOT 5: GUARANTEED TECHNICAL PARTICULARS

OVERHEAD FAULT PASSAGE INDICATORS (COMMUNICABLE)

| Sl# | DESCRIPTION | Units | To be filled up Bidders |
|------------|-------------------------------------------|--------------|--------------------------------|
| A | Application | | |
| 1 | Manufacturer | | |
| 2 | Distribution Network Voltage | kV | |
| 3 | Power Frequency | Hz | |
| 4 | Short circuit Withstand | kA/ms | |
| 5 | HV Neutral Arrangement | | |
| 6 | Cable Diameter | mm | |
| B | Fault detection Parameters | | |
| 9 | Current setting Trigger value | A | |
| 10 | Low earth leakage fault detection setting | A | |
| 11 | Permanent Fault Verification time | sec | |
| 12 | Inrush Restraint | sec | |
| 13 | Automatic reset time | sec | |
| C | Reset (Permanent Fault) | | |
| 14 | Automatic Power Return | Yes/No | |
| 15 | Timer Reset | Yes/No | |
| 16 | Manual Reset medium | Yes/No | |
| 17 | Remote Reset | Yes/No | |
| D | Fault indication | | |
| 18 | Indication | | |
| 19 | Light Power | Lumens | |
| 20 | Visibility Angle | Degree | |
| 21 | Flash Period for permanent faults | Sec | |



LOT 5: GUARANTEED TECHNICAL PARTICULARS

OVERHEAD FAULT PASSAGE INDICATORS (NON-COMMUNICABLE)

| SL# | DESCRIPTION | Units | To be filled up Bidders |
|----------|-------------------------------------------|--------|-------------------------|
| A | Application | | |
| 1 | Manufacturer | | |
| 2 | Distribution Network Voltage | kV | |
| 3 | Power Frequency | Hz | |
| 4 | Short circuit Withstand | kA/ms | |
| 5 | HV Neutral Arrangement | | |
| 6 | Cable Diameter | mm | |
| B | Fault detection Parameters | | |
| 9 | Current setting Trigger value | A | |
| 10 | Low earth leakage fault detection setting | A | |
| 11 | Permanent Fault Verification time | sec | |
| 12 | Inrush Restraint | sec | |
| 13 | Automatic reset time | sec | |
| C | Reset (Permanent Fault) | | |
| 14 | Automatic Power Return | V | |
| 15 | Timer Reset | min | |
| 16 | Magnet Reset | Yes/No | |
| 17 | Remote Reset | Yes/No | |
| D | Fault indication | | |
| 18 | Indication | | |
| 19 | Light Power | Lumens | |
| 20 | Visibility Angle | Degree | |
| 21 | Flash Period for permanent faults | Sec | |



GUARANTEED TECHNICAL PARTICULAR FOR**Item # 1: 3P, 800 A Distribution Pillar with Change over Switch**

| SL. No | Parameters | Unit | To be filled up by bidders |
|---------------|-----------------------------------------------------------------------------|-------------|-----------------------------------|
| 1 | Name of Manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Rated short time withstand current | kA | |
| 4 | Rated Voltage | V | |
| 5 | Rated Frequency | Hz | |
| 6 | No. of phases | | |
| 7 | Clearances Phase to phase (TO BE ALTITUDE CORRECTED AT 2400M) | | |
| 8 | Clearances between live parts and earth (TO BE ALTITUDE CORRECTED AT 2400M) | | |
| 9 | Type and thickness of sheet steel (hot/ cold rolled) Frame/Doors/Covers | | |
| 10 | HRC Cartridge fuse used | | |
| 11 | Fuse rupturing capacity | kA | |
| 12 | Degree of protection of Enclosure | | |
| 13 | Colour finish shade of Pillar | | |
| | Interior | | |
| | Exterior | | |



| SL. No | Parameters | Unit | To be filled up by bidders |
|--------|-----------------------------------------------------------------------------|---------|----------------------------|
| | Bus Bars | | |
| 1 | Material | | |
| 2 | Cross section | | |
| 3 | Rated normal current of busbars | A | |
| 4 | Rated short time withstand current and time | kA | |
| 5 | Material of the support insulators | mm | |
| | Change over Switch | | |
| 1 | Rated Current (A) | A | |
| 2 | Rated Impulse Withstand Voltage (U_{imp}) | kV | |
| 3 | Rated Insulation Voltage (U_j): | V | |
| 4 | Rated Short-Circuit Making Capacity (I_{cm}) (kA) | kA | |
| 5 | Rated Short-time Withstand Current (I_{cw}) for 1 second (kA_{rms}) | (kArms) | |
| 6 | Pole | | |
| 7 | Handle Type | | |
| 8 | Handle IP | | |
| 9 | Fourth Pole Position | | |
| 10 | Switches Operating Mechanism | | |



GUARANTEED TECHNICAL PARTICULAR FOR

Item#2: 3P, 800 A Distribution Pillar with MCCB

| SL. No | Parameters | Unit | To be filled up by bidders |
|-------------------------------------|-----------------------------------------------------------------------------|------|----------------------------|
| 1 | Name of Manufacturer and country | | |
| 2 | Applicable standards | | |
| 3 | Rated short time withstand current | kA | |
| 4 | Rated Voltage | V | |
| 5 | Rated Frequency | Hz | |
| 6 | No. of phases | | |
| 7 | Clearances Phase to phase (TO BE ALTITUDE CORRECTED AT 2400M) | | |
| 8 | Clearances between live parts and earth (TO BE ALTITUDE CORRECTED AT 2400M) | | |
| 9 | Type and thickness of sheet steel (hot/ cold rolled) Frame/Doors/Covers | | |
| 10 | HRC Cartridge fuse used | | |
| 11 | Fuse rupturing capacity | kA | |
| 12 | Degree of protection of Enclosure | | |
| 13 | Colour finish shade of Pillar | | |
| | Interior | | |
| | Exterior | | |
| Bus Bars | | | |
| 1 | Material | | |
| 2 | Cross section | | |
| 3 | Rated normal current of busbars | A | |
| 4 | Rated short time withstand current and time | kA | |
| 5 | Material of the support insulators | mm | |
| Moulded Case Circuit Braeker | | | |
| 1 | Make | | |
| 2 | Number of poles | | |
| 3 | Breaking Capacity | kA | |
| 4 | Rated Current | A | |

