OPEN TENDER NOTIFICATION

FOR

Rate contract for SITC of 33kV & 11kV Control and Relay Panel at TPCODL

Tender Enquiry No.: TPCODL/P&S/1000000618/23-24

Due Date for Bid Submission: 10.04.2024 [17:00 Hrs.]

The TP Central Odisha Distribution Limited

1st Floor, Anuj Building, 19, Satya Nagar, Bhubaneswar-751007.

CONTENTS OF THE ENQUIRY

1.0 Event Information

1.1 Scope of work

Open Tenders are invited through Ariba online portal e-tender process from interested Bidders for Rate contract for supply of following Items as defined below:

S. No.	Description	EMD Amount (Rs.)	Tender Fee Inclusive of GST (Rs.)
1	Rate contract for SITC of 33 & 11kV Control and Relay Panel at TPCODL	6,00,000/-	5000/-

Note:-

1) EMD is exempted for MSME Firms registered in the State of Odisha.

2) MSMEs registered in the State of Odisha shall pay tender fee of Rs. 1,000/- including GST.

1.2 Availability of Tender Documents

Please Refer "Procedure to participate in the e-Tender".

1.3 Calendar of Events

(a)	Date of sale/ availability of tender documents from TPCODL Website	From 22.03.2024 onwards
(b)	Date by which Interested and Eligible Bidder to pay Tender Fee and confirm participation as mentioned in "Procedure to Participate in Tender"	30.03.2024 , 15:00 Hrs
(c)	Date & Time of Pre-Bid Meeting (If any)	04.04.2024 , 15.00 Hrs.
(d)	Last Date and time of receipt of pre-bid queries, if any	04.04.2024 up to 15:00 Hours
(e)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	07.04.2024
(f)	Last date and time of receipt of Bids	10.04.2024 up to 15:00 Hours
(g)	Date & Time of opening technical bids & EMD (Envelope-1 & 2)	Participating Bidders will get mail intimation from TPCODL E-Tender system (Ariba) when their Technical Bids are opened. Refer Section 4.2 for details
(h)	Date & Time of opening of Price of qualified bids	Bidders will get mail intimation from TPCODL E-Tender system (Ariba) when their Price Bids are opened (Refer Section 4.5)

Note :- In the event of last date specified for submission of bids and date of opening of bids is declared as a closed holiday for TPCODL Bhubaneswar office, the last date of submission of bids and date of opening of bids will be the following working day at appointed times.

1.4 Mandatory documents required along with the Bid

Following documents are to be furnished along with the bid to the address as mentioned at clause 3.1.

1.4.1 EMD of requisite value and validity

1.4.2 Tender Fee in case the tender is downloaded from website

1.4.3 Requisite Documents for compliance to Qualification Criteria mentioned in Clause 1.7.

1.4.4 Drawing, Type Test details along with a sample of each item as specified at Annexure I (as applicable)

1.4.5 Duly signed and stamped 'Schedule of Deviations' as per Annexure III on bidder's letter head.

1.4.6 Duly signed and stamped 'Schedule of Commercial Specifications' as per Annexure IV on bidder's letter head.

1.4.7 Proper authorization letter/ Power of Attorney to sign the tender on the behalf of bidder.

1.4.8 Copy of PAN, GST, PF and ESI Registration (In case any of these documents is not available with the bidder, same to be explicitly mentioned in the 'Schedule of Deviations')

Please note that in absence of any of the above documents, the bid submitted by a bidder shall be liable for rejection.

1.5 Deviation from Tender

Normally, the deviations to tender terms are not admissible and the bids with deviation are liable for rejection. Hence, the bidders are advised to refrain from taking any deviations on this Tender. Still in case of any deviations, all such deviations shall be set out by the Bidders, clause by clause in the 'Annexure III - Schedule of Deviations' and same shall be submitted as a part of the Technical Bid.

1.6 Right of Acceptance/Rejection

Bids are liable for rejection in absence of following documents:-

1.6.1 EMD of requisite value and validity
1.6.2 Tender fee of requisite value
1.6.3 Price Bid as per the Price Schedule mentioned in Annexure-I
1.6.4 Necessary documents against compliance to Qualification Requirements mentioned at Clause 1.7 of this Tender Document.
1.6.5 Filled in Schedule of Deviations as per Annexure III
1.6.6 Filled in Schedule of Commercial Specifications as per Annexure IV
1.6.7 Receipt of Bid within the due date and time

TPCODL reserves the right to accept/reject any or all the bids without assigning any reason thereof.

1.7 Qualification Criteria

a) The average annual turnover of the bidder shall be a minimum of Rs.15 Cr in last three financial years. (FY 20-21, FY 21-22 & FY 22-23). Copy of audited Balance Sheet and P&L Account / Turn over Certificate to be submitted in this regard.

b) The bidder should have performance certificates for similar works for one year satisfactory performance from at least one reputed power utility for similar or higher voltage rating. The work against the issued certificate should be completed in last three years from the date of bid submission. In case the bidder has a previous association with Tata Power for similar products and services, the performance feedback for that bidder by TPC User Group shall only be considered irrespective of performance certificates issued by any third organization. (Copy of Performance Certificate issued by client to be submitted).

c) The bidder should have supplied similar or higher rating panels for minimum 50% of the quantity tendered in the immediate past three financial years.

d) The bidder should have own manufacturing or authorized sub-contracted manufacturing facility to manufacture control panels and in-house testing facilities for acceptance tests as per specifications. Bidder must submit undertaking in this regard.

In case the bidder is a panel manufacturer, bidder shall arrange for factory evaluation/ pre-dispatch inspection/ routine and acceptance tests at OEM works, as per requirement (authorization letter from panel manufacturer to be submitted).

e) Bidder need to procure equipment from TPCODL approved makes only. Also bidder will get into agreement with sub-contractors to provide support/spares to TPCODL during warranty period.

f) 'Indian Companies in joint venture relationship with global OEM' or 'Authorized Indian Channel partner / Sales representatives of Global OEM' are also eligible to bid if the qualification requirements stated above are met independently or in combination with the OEM. (Self-Undertaking along with Authorization letter from OEM to be submitted)

The bidder must have all statutory compliance like valid PAN no, GSTN etc. The bidder must submit the copy of all these registrations.

1.8 Marketing Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the General Condition of Contracts. Bidders must agree to these rules prior to participating. In addition to other remedies available, TPCODL reserves the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the General Condition of Contracts. A bidder who violates the market place rules or engages in behaviour that disrupts the fair execution of the marketplace, may result in restriction of a bidder from further participation in the marketplace for a length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace
- Breach of terms as published in TENDER/NIT

1.9 Supplier Confidentiality

All information contained in this tender is confidential and shall not be disclosed, published or advertised in any manner without written authorization from TPCODL. This includes all bidding information submitted to TPCODL. All tender documents remain the property of TPCODL and all suppliers are required to return these documents to TPCODL upon request. Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

2.0 Evaluation Criteria

- The bids will be evaluated technically on the compliance to tender terms and conditions.
- The bids will be evaluated commercially on overall lowest cost in BOQ Basis as calculated in Schedule of Items [Annexure I] .TPCODL reserves the right to split the order quantity wise. Hence all bidders are advised to quote their most competitive rates.
- In case of Reverse Auction, if any change arises in overall BOQ price, it shall be applicable proportionately in each line item in the complete tender BOQ.
- Bidder has to mandatorily quote as per schedule of item [Annexure-I]. Failing to do so TPCODL may reject the bid.

NOTE:

In case of a new bidder not registered, inspection of Testing house and evaluation shall be carried out to ascertain bidder's capability and quality procedures. However TPCODL reserves the right to carry out inspection and evaluation for any bidder prior to technical qualification. In case a bidder is found as Disqualified in the evaluation, their bid shall not be evaluated any further and shall be summarily rejected. The decision of TPCODL shall be final and binding on the bidder in this regard.

2.1

Price Variation Clause: The prices shall remain **FIRM** during the entire contract period.

3.0 Submission of Bid Documents

3.1 Bid Submission

Bidders are requested to submit their offer in line with this Tender document through e-tendering process.
Please note all future correspondence regarding the tender, bid submission, bid submission date extension, Pre-bid query etc will happen only through TPCODL E-Tender system (Ariba).

No verbal correspondence will be responded. All communication will be done strictly with the bidder who have done the above step to participate in the Tender.

Bids shall be submitted in 3 (Three) parts:
FIRST PART: "**EMD**" as applicable shall be submitted. The EMD shall be valid for 210 days from the due date of bid submission in the form of Bank Guarantee / Bank Draft / Bankers Pay Order (issued from a Scheduled Bank) favoring 'TP Central Odisha Distribution Limited" payable at Bhubaneswar. The EMD (BG) has to be strictly in the format as mentioned in General Condition of Contract, failing which it shall not be accepted and the bid as submitted shall be liable for rejection. A separate non refundable tender fee of stipulated amount also needs to be transferred online through NEFT/ RTGS

in case the tender document is downloaded from our website.

TPCODL/ TPCODL Bank Details for transferring Tender Fee and EMD is as below:

Account Name: TP Central Odisha Distribution Limited
Bank Name: SBI, IDCO Towers, Bhubaneswar
Bank Account No. : 10835304915
IFSC Code : SBIN0007891

EMD is strictly preferred in form of Bank Guarantee and to be delivered at the following address. However in view of present situation if Bidder is finding it difficult to make and submit BG for EMD amount, they can do online transfer of EMD amount in the above mentioned Account and submit proof of the same as part of Bid Submission.

Please note that in such case, Tender Fee and EMD should be strictly 2 separate transactions.

Please note as return of EMD from Bank Account is non standard practice the same may take more time than return of EMD BG.

EMD Original Hard Copy shall be delivered at the following address in Envelope clearly indicating Tender Reference/ Enquiry Number, Name of Tender and Bidder Name

Chief (Procurement & Stores)
TP CENTRAL ODISHA DISTRIBUTION LIMITED

1st floor, Anuj building, Plot No. 29, Satya Nagar, Bhubaneswar, Odisha – 751007

SECOND PART: "TECHNICAL BID" shall contain the following documents:

a) Documentary evidence in support of qualifying criteria
b) Technical literature/GTP/Type test report etc. *(if applicable)*
c) Qualified manpower (if available)
d) Testing facilities *(if applicable)*
e) No Deviation Certificate as per the Annexure III – Schedule of Deviations
f) Acceptance to Commercial Terms and Conditions viz Delivery schedule/period, payment terms etc. as per the Annexure IV – Schedule of Commercial Specifications.
g) Quality Assurance Plan/Inspection Test Plan for supply items *(if applicable)*

The technical bid shall be properly indexed and is to be submitted through TPCODL E-tender System (Ariba) only. Hard Copy of Technical Bids need not be submitted.

The Bid prepared by the Bidder, and all correspondence and documents relating to the Bid exchanged by the Bidder and the TPCODL, shall be written in the English Language. Any printed literature furnished by the Bidder may be written in another Language, provided that this literature is accompanied by an English translation, in which case, for purposes of interpretation of the Bid, the English translation shall govern

THIRD PART: "PRICE BID" shall contain only the price details and strictly in format as mentioned in Annexure I (separate Price Bid for Lot-A & Lot-B shall be submitted) with explicit break up of basic prices, Taxes & duties, Freight etc. In case any discrepancy is observed between the item description stated in Schedule of Items mentioned in the tender and the price bid submitted by the bidder, the item description as mentioned in the tender document (to the extent modified through Corrigendum issued if any) shall prevail. Price Bid is to be submitted in soft copy through TPCODL E-Tendering system (Ariba) only. **Hard copy of Price Bid not be submitted**.

SIGNING OF BID DOCUMENTS:

The bid must contain the name, residence and place of business of the person or persons making the bid and must be signed and sealed by the Bidder with his usual signature. The names of all persons signing should also be typed or printed below the signature.

The Bid being submitted must be signed by a person holding a Power of Attorney authorizing him to do so, certified copies of which shall be enclosed.

The Bid submitted on behalf of companies registered with the Indian Companies Act, for the time being in force, shall be signed by persons duly authorized to submit the Bid on behalf of the Company and shall be accompanied by certified true copies of the resolutions, extracts of Articles of Association, special or general Power of Attorney etc. to show clearly the title, authority and designation of persons signing the Bid on behalf of the Company. Satisfactory evidence of authority of the person signing on behalf of the Bidder shall be furnished with the bid.

A bid by a person who affixes to his signature the word 'President', 'Managing Director', 'Secretary', 'Agent' or other designation without disclosing his principal will be rejected.

The Bidder's name stated on the Proposal shall be the exact legal name of the firm.

3.2 Contact Information

Please note all correspondence regarding the tender, bid submission, bid submission date extension, Pre-bid query etc will happen only through TPCODL E-Tender system (Ariba).
No verbal correspondence will be responded. All communication will be done strictly with the bidder who have done the above step to participate in the Tender. **Communication Details:**

Handling Executive :

Name: Mr. Prashant Gupta

Contact No.: 9634077589

E-Mail ID: prashant.gupta@tpcentralodisha.com

Sr. General Manager (Purchase & Stores)

Name: Sri Sudhakar Behera

Contact No.: 9437282663

E-Mail ID: Sudhakar.behera@tpcentralodisha.com

Bidders are strictly advised to communicate with Package Owner through TPCODL E-tender System (Ariba) only. They need to pay Tender Participation Fee and receive the Ariba log-in. Above escalation details are for reference purpose only.

3.3 Bid Prices

Bidders shall quote for the entire Scope of Supply/ work with a break up of prices for individual items and Taxes & duties. The bidder shall complete the appropriate Price Schedules included herein, stating the Unit Price for each item & total price with taxes, duties & freight up to destination at various sites of TPCODL. The all-inclusive prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during the execution of the supply work, breakup of price constituents.

Applicable GST to be specified clearly.

The quantity break up shown else-where other than Price Schedule is tentative. The bidder shall ascertain himself regarding material required for completeness of the entire work. Any items not indicated in the price schedule but which are required to complete the job as per the Technical Specifications/ Scope of Work/ SLA mentioned in the tender, shall be deemed to be included in prices quoted.

3.4 Bid Currencies

Prices shall be quoted in Indian Rupees Only.

3.5 Period of Validity of Bids

Bids shall remain valid for 180 days from the due date of submission of the bid.

Notwithstanding clause above, the TPCODL may solicit the Bidder's consent to an extension of the Period of Bid Validity. The request and responses thereto shall be made in writing.

3.6 Alternative Bids

Bidders shall submit Bids, which comply with the Bidding documents. Alternative bids will not be considered. The attention of Bidders is drawn to the provisions regarding the rejection of Bids in the terms and conditions, which are not substantially responsive to the requirements of the bidding documents.

3.7 Modifications and Withdrawal of Bids

The bidder is not allowed to modify or withdraw its bid after the Bid's submission. The EMD as submitted along with the bid shall be liable for forfeiture in such event.

3.8 Earnest Money Deposit (EMD))-

The bidder shall furnish, as part of its bid, an EMD amounting as specified in the tender. The EMD is required to protect the TPCODL against the risk of bidder's conduct which would warrant forfeiture.
The EMD shall be denominate in any of the following form:

- Banker's Cheque/ Demand Draft/ Pay order drawn in favour of TPCODL, payable at Bhubaneswar.
- Online transfer of requisite amount through NEFT/ RTGS.
- Bank Guarantee valid for 210 days after due date of submission.

The EMD shall be forfeited in case of:

a) The bidder withdraws its bid during the period of specified bid validity.

Or

b) The case of a successful bidder, if the Bidder does not

i) accept the purchase order, or
ii) furnish the required performance security BG

3.9 Type Tests (if applicable)

The type tests specified in TPCODL specifications should have been carried out within five years prior to the date of opening of technical bids and test reports are to be submitted along with the bids. If type tests carried out are not within the five years prior to the date of bidding, the bidder will arrange to carry out type tests specified, at his cost. The decision to accept/ reject such bids rests with TPCODL.

4.0 Bid Opening & Evaluation process

4.1 Process to be confidential

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence the TPCODL's processing of Bids or award decisions may result in the rejection of the Bidder's Bid.

4.2 Technical Bid Opening

The bids shall be opened at TPCODL office in front of participated bidders either physically or in virtual mode . A link shall be provided to the participated bidders to view the tender opening process online. Also Participating Bidders shall get mail intimation from TPCODL E-Tender system (Ariba) when their Technical Bids are opened.
First the envelope marked “EMD” will be opened. Bids without EMD/ cost of tender (if applicable) of required amount/ validity in prescribed format, shall be rejected.

4.3 Preliminary Examination of Bids/Responsiveness

TPCODL will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the Bids are generally in order. TPCODL may ask for submission of original documents in order to verify the documents submitted in support of qualification criteria.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price per item that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price per item will be corrected. If there is a discrepancy between the Total Amount and the sum of the total price per item, the sum of the total price per item shall prevail and the Total Amount will be corrected.

Prior to the detailed evaluation, TPCODL will determine the substantial responsiveness of each Bid to the Bidding Documents including production capability and acceptable quality of the Goods offered. A substantially responsive Bid is one, which conforms to all the terms and conditions of the Bidding Documents without material deviation.

Bid determined as not substantially responsive will be rejected by the TPCODL and may not subsequently be made responsive by the Bidder by correction of the non-conformity.

4.4 Techno Commercial Clarifications

Bidders need to ensure that the bids submitted by them are complete in all respects. To assist in the examination, evaluation and comparison of Bids, TPCODL may, at its discretion, ask the Bidder for a clarification on its Bid for any deviations with respect to the TPCODL specifications and attempt will be made to bring all bids on a common footing. All responses to requests for clarification shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted owing to any clarifications sought by TPCODL.

4.5 Price Bid Opening

Price bid of only Techno-commercially and / or safety qualified Bidders shall be opened internally. Bidders shall get mail intimation from TPCODL E-Tender system (Ariba) when their Price Bids are opened.
The EMD of the bidder withdrawing or substantially altering his offer at any stage after the technical bid opening will be forfeited at the sole discretion of TPCODL without any further correspondence in this regard.

4.7 Reverse Auctions

TPCODL shall conduct the reverse auction for the products/ services being asked for in this tender. The terms and conditions for such reverse auction events shall be as per the Acceptance Form attached as Annexure VI of this document. The bidders along with the tender document shall mandatorily submit a duly signed copy of the Acceptance Form attached as Annexure VI as a token of acceptance for the same.

Reverse Auction shall be as per the below approach:

No of bidders to be allowed in RA process shall be : Total No of bidders on whom tender would be split PLUS 2 more bidders .

Illustrative example: Total no of qualified bidders is 10 & tender needs to split amongst 4 bidders.

PLUS 2 means (04 + 02 = 06) means lowest 6 bidders i.e., L1 to L6 bidders would be allowed in the RA process. Balance, H1 to H4 bidders would not be allowed in the RA process.

In case – Total no of qualified bidders is equal to or less than the PLUS 2 number, all qualified bidders shall be allowed in the RA process.

Illustrative example: Total no of qualified bidders is 4 & tender needs to split amongst 2 bidders. PLUS 2 means (02 + 02 = 04), so all 4 qualified bidders would be allowed in the RA process .

Illustrative example: Total no of qualified bidders is 3 & tender would be awarded to single party only. PLUS 2 means (01 + 02 = 03), so all 3 qualified bidders would be allowed in the RA process

5.0 Award Decision

TPCODL will award the contract to the successful bidder whose bid has been determined to be the lowest-evaluated responsive bid as per the Evaluation Criterion mentioned at Clause 2.0. The Cost for the said calculation shall be taken as the all-inclusive cost quoted by bidder in Annexure I (Schedule of Items) subject to any corrections required in line with Clause 4.3 above. The decision to place purchase order/LOI solely depends on TPCODL on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that TPCODL may deem relevant.

TPCODL reserves all the rights to award the contract to one or more bidders so as to meet the delivery requirement or nullify the award decision without assigning any reason thereof.

In case any supplier is found unsatisfactory during the delivery process, the award will be cancelled and TPCODL reserves the right to award other suppliers who are found fit.

6.0 Order of Preference/Contradiction:

In case of contradiction in any part of various documents in tender, following shall prevail in order of preference:

1. Schedule of Items (Annexure I)
2. Post Award Contract Administration (Clause 7.0)
3. Submission of Bid Documents (Clause 3.0)

4. Scope of Work and SLA (if any)
5. Technical Specifications (Annexure II)
6. Inspection Test Plan (if any)
7. Acceptance Form for Participation in Reverse Auction (Annexure VI)
8. General Conditions of Contract (Annexure VII)

7.0 Post Award Contract Administration

7.1 Special Conditions of Contract

- After finalization of tender, Rate Contract shall be issued on successful bidder with a validity period of **One Year**. Prices shall remain firm till validity of issued rate contract. Within the validity of rate contract and as per requirement of material, release order shall be issued time to time.
- Business Associate (BA) shall submit applicable Performance Bank Guarantee as per GCC within 30 days of issuance of rate contract. PBG applicable shall 5% of Rate Contract Value or 10% of Release Order value. PBG against Release Order has to be submitted against each Release Order. PBG submitted, shall be released after completion of applicable guarantee period plus one month.
- Guarantee applicable shall be as per technical specifications.
- **Within 30 days of Rate Contract issuance by TPCODL, it is the responsibility of BA to get manufacturing clearance and CAT-A issued from TPCODL.** In case BA does not get necessary approvals for issuance of CAT-A within mentioned / mutually agreed timelines, then TPCODL reserve the right to cancel issued rate contract / release order and also reserve the right to forfeit EMD / PBG.
- Delivery period shall be 60 days from date of receipt of release order / CAT-A issuance, whichever is later.
- TPCODL shall short close the issued Release Order / Rate contract, in case of any quality issues.
- Any change in statutory taxes, duties and levies shall be borne by TPCODL.
- All other terms and conditions of TPCODL GCC shall be applicable.

7.2 Drawing Submission & Approval

The relevant Survey , drawings and GTPs need to be submitted within two weeks of receipt of rate contract by the successful bidder to TPCODL for approval. In case, re-submission of drawings is required on request of TPCODL, same needs to be submitted back to TPCODL within 5 days of such request.

7.3 Delivery Terms

The delivery schedule shall be **60 days** from the date of issuing of PO/RO issued by MRP Team as per the monthly Capacity of Manufacturer.

7.4 Guarantee/Warranty Period

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of **12 months** from the date of supply, the bidder shall be liable to undertake to replace/rectify such defects at its own costs, within 45 days time frame and to the entire satisfaction of TPCODL, falling which TPCODL will be at liberty to get it replaced/rectified at the bidder risks and cost and recover all such expenses plus the company's own charges (@20% of total expenses incurred) from the bidder or from the "Security from Performance Deposit" as the case may be .

7.5 Payment Terms

On successful completion of SITC work in good condition and certification of acceptance by certified official, Associate shall submit the Bills/ Invoices in original in the name of TP Central Odisha Distribution

Limited to Invoice Desk. 100 payment shall be released **within 30 days from the date of submission of certified bills/ invoices.**

7.6 Climate Change

Significant quantities of waste are generated during the execution of project and an integrated approach for effective handling, storage, transportation and disposal of the same shall be adopted. This would ensure the minimization of environmental and social impact in order to combat the climate change.

7.7 Ethics

TPCODL is an ethical organization and as a policy TPCODL lays emphasis on ethical practices across its entire domain. Bidder should ensure that they should abide by all the ethical norms and in no form either directly or indirectly be involved in unethical practice.

TPCODL work practices are governed by the Tata Code of Conduct which emphasizes on the following:

- We shall select our suppliers and service providers fairly and transparently.
- We seek to work with suppliers and service providers who can demonstrate that they share similar values. We expect them to adopt ethical standards comparable to our own.
- Our suppliers and service providers shall represent our company only with duly authorized written permission from our company. They are expected to abide by the Code in their interactions with, and on behalf of us, including respecting the confidentiality of information shared with them.
- We shall ensure that any gifts or hospitality received from, or given to, our suppliers or service providers comply with our company's gifts and hospitality policy.
- We respect our obligations on the use of third party intellectual property and data.

Bidder is advised to refer GCC attached at Annexure VII for more information.

Any ethical concerns with respect to this tender can be reported to the following e-mail ID: ethics@tpcentralodisha.com

8.0 Specification and standards

Attached separately with the tender As per Annexure II.

9.0 General Condition of Contract

Any condition not mentioned above shall be applicable as per GCC for Supply attached along with this tender at Annexure VII.

10.0 Safety

Safety related requirements as mentioned in our safety Manual put in the Company's website which can be accessed by: http://www.tpcentralodisha.com. All Associates shall strictly abide by the guidelines provided in the safety manual at all relevant stages during the contract period.

ANNEXURE I

Schedule for Items

Sl. No.	Item Description	HSN/ SAC code	Qty.	UoM.	Unit Price (Rs.)	GST (Rs.)	All incl. Unit Price (Rs.)	All incl. BOQ Price (Rs.)
1	2	3	4	5	6	7	8=6+7	9=8x4
1	CR PANEL FR 3 FEEDER PROTECTION(33/11KV)		88	EA				
2	Installation, Testing & Commissioning of CR PANEL FR 3 FEEDER PROTECTION(33/11KV)		88	EA				
3	CR PANEL FOR 2 TRF FDR PROTECTION 33 KV		20	EA				
4	Installation, Testing & Commissioning of CR PANEL FOR 2 TRF FDR PROTECTION 33 KV		20	EA				

NOTE:

- The quantity mentioned above is for evaluation purpose only and may vary during the execution. Release Orders against this Rate Contract shall be issued by TPCODL as per actual requirement.
- The bidders are advised to quote prices strictly in the above format and for all the line items as mentioned above. Failing to do so, bids are liable for rejection.
- Unit price (column 6) against sl no 1 in the table above shall be inclusive of ex-works price, Transit Insurance, transport charges upto 100KM Distance from Manufacturing site, loading, unloading and all other handling charges. Transportation cost beyond 100KM (sl no 2 of above table) should be quoted only in column 6, 7 and 8.
- The bidders are advised to quote prices strictly in the above format. Failing to do so, bids are liable for rejection.
- The bidder must fill each and every column of the above format. Mentioning “extra/inclusive” in any of the column may lead for rejection of the price bid.
- No cutting/ overwriting in the prices is permissible.
- Quantities mentioned above is for evaluation purpose only and is not guaranteed. Quantities may change as per actual requirements.
- All price shall remain firm and fixed for one year for placement of RO

Annexure II
Technical Specifications

Attached separately

ANNEXURE III

Schedule of Deviations

Bidders are advised to refrain from taking any deviations on this TENDER. Still in case of any deviations, all such deviations from this tender document shall be set out by the Bidders, Clause by Clause in this schedule and submit the same as a part of the ***Technical Bid.***

Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the TPCODL's specifications:

S. No.	Clause No.	Tender Clause Details	Details of deviation with justifications

By signing this document we hereby withdraw all the deviations whatsoever taken anywhere in this bid document and comply to all the terms and conditions, technical specifications, scope of work etc. as mentioned in the standard document except those as mentioned above.

Seal of the Bidder:

Signature:

Name:

ANNEXURE IV

Schedule of Commercial Specifications

(The bidders shall mandatorily fill in this schedule and enclose it with the offer Part I: Technical Bid. In the absence of all these details, the offer may not be acceptable.)

S. No.	Particulars	Remarks
1.	Prices firm or subject to variation (If variable indicate the price variation clause with the ceiling if applicable)	Firm / Variable
1a.	If variable price variation on clause given	Yes / No
1b.	Ceiling	--------- %
1c.	Inclusive of Excise Duty	Yes / No (If Yes, indicate % rate)
1d.	Sales tax applicable at concessional rate	Yes / No (If Yes, indicate % rate)
1e.	Octroi payable extra	Yes / No (If Yes, indicate % rate)
1f.	Inclusive of transit insurance	Yes / No
2.	Delivery	Weeks / months
3.	Guarantee clause acceptable	Yes / No
4.	Terms of payment acceptable	Yes / No
5.	Performance Bank Guarantee acceptable	Yes / No
6.	Liquidated damages clause acceptable	Yes / No
7.	Validity (90 days) (From the date of opening of technical bid)	Yes / No
8.	Inspection during stage of manufacture	Yes / No
9.	Rebate for increased quantity	Yes / No (If Yes, indicate value)
10.	Change in price for reduced quantity	Yes / No (If Yes, indicate value)
11.	Covered under Small Scale and Ancillary Industrial Undertaking Act 1992	Yes / No (If Yes, indicate, SSI Reg'n No.)

ANNEXURE V

Checklist of all the documents to be submitted with the Bid

Bidder has to mandatorily fill in the checklist mentioned below:-

S. No.	Documents attached	Yes / No / Not Applicable
1	EMD of required value	
2	Tender Fee as mentioned in this RFQ	
3	Company profile/organ gram	
4	Signed copy of this RFQ as an unconditional acceptance	
5	Duly filled schedule of commercial specifications (Annexure IV)	
6	Sheet of commercial/technical deviation if any (Annexure III)	
7	Balance sheet for the last completed three financial years; mandatorily enclosing Profit & loss account statement	
8	Acknowledgement for Testing facilities if available (duly mentioned on bidder letter head)	
9	List of Machine/tools with updated calibration certificates if applicable	
10	Details of order copy (duly mentioned on bidder letter head)	
11	Order copies as a proof of quantity executed	
12	Details of Type Tests if applicable (duly mentioned on bidder letter head)	
13	All the relevant Type test certificates as per relevant IS/IEC (CPRI/ERDA/other certified agency) if applicable	
14	Project/supply Completion certificates	
15	Performance certificates	
16	Client Testimonial/Performance Certificates	
17	Credit rating/solvency certificate	
18	Undertaking regarding non blacklisting (On company letter head)	
19	List of trained/untrained Manpower	

Annexure VI

Acceptance Form for Participation In Reverse Auction Event

(To be signed and stamped by the bidder)

In a bid to make our entire procurement process more fair and transparent, TPCODL intends to use the reverse auctions through SAP-SRM tool as an integral part of the entire tendering process. All the bidders who are found as technically qualified based on the tender requirements shall be eligible to participate in the reverse auction event.

The following terms and conditions are deemed as accepted by the bidder on participation in the bid event:

1. TPCODL shall provide the user id and password to the authorized representative of the bidder. *(Authorization Letter in lieu of the same shall be submitted along with the signed and stamped Acceptance Form).*
2. TPCODL will make every effort to make the bid process transparent. However, the award decision by TPCODL would be final and binding on the supplier.
3. The bidder agrees to non-disclosure of trade information regarding the purchase, identity of TPCODL, bid process, bid technology, bid documentation and bid details.
4. The bidder is advised to understand the auto bid process to safeguard themselves against any possibility of non-participation in the auction event.
5. In case of bidding through Internet medium, bidders are further advised to ensure availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitch, internet response issues, software or hardware hangs, power failure or any other reason shall not be the responsibility of TPCODL.
6. In case of intranet medium, TPCODL shall provide the infrastructure to bidders. Further, TPCODL has sole discretion to extend or restart the auction event in case of any glitches in infrastructure observed which has restricted the bidders to submit the bids to ensure fair & transparent competitive bidding. In case of an auction event is restarted, the best bid as already available in the system shall become the start price for the new auction.
7. In case the bidder fails to participate in the auction event due any reason whatsoever, it shall be presumed that the bidder has no further discounts to offer and the initial bid as submitted by the bidder as a part of the tender shall be considered as the bidder's final no regret offer. Any offline price bids received from a bidder in lieu of non-participation in the auction event shall be out-rightly rejected by TPCODL.
8. The bidder shall be prepared with competitive price quotes on the day of the bidding event.
9. The prices as quoted by the bidder during the auction event shall be inclusive of all the applicable taxes, duties and levies and shall be FOR at TPCODL site.
10. The prices submitted by a bidder during the auction event shall be binding on the bidder.
11. No requests for time extension of the auction event shall be considered by TPCODL.
12. The original price bids of the bidders shall be reduced on pro-rata basis against each line item based on the final all inclusive prices offered during conclusion of the auction event for arriving at Contract amount.

Signature & Seal of the Bidder

Annexure VII

General Conditions of Contract – Attached separately with the tender

Annexure VII (a)

Preferential norms for procurement from Local MSMEs

1) Tender Fees

To participate in the tender, MSMEs registered in the State of Odisha shall pay Rs.1,000/- including GST towards cost of tender paper. In Limited Tender no EMD shall applicable.

2) Earnest Money Deposit (EMD)

EMD shall be exempted for MSME registered in the State of Odisha. However, Bidder shall be barred to participate in the tendering process for a period of 2 years in case it backs out post award of the contract.

3) Qualification Requirement for Open Tenders

Qualification Requirement of Financial Turnover for MSME registered in the State of Odisha shall be reduced to 20% of the existing criteria.

For past experience, instead of relying on the volumes / value of earlier Supplies / Projects, assessment of the Bidder shall be done on the basis of feedback from Customers. Past performance experience at Tata Power and its Group Companies shall supersede feedback from other Customers.

4) Reservation for MSME

It shall be mandatory to procure at least 20% of the total volume of the procurement from MSME registered in the State of Odisha (however, it shall not apply where goods/services are not available with the MSME), subject to matching L1 discovered prices and meeting technical specifications including quality requirements.

5) Performance Bank Guarantees

Performance Bank Guarantee for MSME registered in the State of Odisha shall be 25% of the value normally prescribed.

Annexure VIII

Safety Policy and Safety Terms and Conditions – Attached separately with the tender.

Annexure IX

Tata Code of Conduct (TCoC) –
Attached separately with the tender.

Annexure X

Environment & Sustainability – Attached separately with the tender.

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV- **Specification Name:** Technical Specification for 33 & 11kV Control and Relay Panel (3Tier for Feeder Protection & 2 Tier for Transformer Protection)

CONTENTS

1. SCOPE

The scope of this specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading of CRP, IEDs, relays and all other items & tools required for protection of 33kV/11kV power system as mentioned in the specification, at site/stores complete with all accessories including supply, installation, testing andcommissioning of efficient and trouble free protection system. The specific requirements are covered in the enclosed technical data sheet.

The C&R Panel covered in the Scope of TS are:

a) 11KV Feeder Panel
b) 11KV I/C Panel
c) 11KV B/C Panel
d) 33KV Feeder Panel
e) 33/11 KV Transformer Panel
f) 11KV Capacitor Panel

C&R Panels may be designed for Indoor application.

2. APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, constructedand tested in accordance with latest revisions of relevant Indian/EEC/other applicable standards shall confirm to the regulations of local statutory authorities.

IS 9000: Basic Environmental testing procedure for electrical and electronic items

IS 3231:Part 3 Sec 1 : Specification for Electrical Relays for Power System Protection Part 3 : Requirements for Particular Group of Relays - Section 1: Non-specified Timeor Independent Specified Time Measuring Relays

1S 3231:Part 3:Sec 2 : Specification for Electrical Relays for Power System Protection Part 3 :Requirements for Particular Group of Relays Section 2 : Dependent Specified Time Measuring Relays

IS 3231:Part 3:Sec 3: Specification for Electrical Relays for Power System Projection - Part 3 : Requirements for Particular Group of Relays - Section 3 : Biased (Percentage)Differential Relays

IEC 60255 :Measurine Relays and Protection Equipment

IS 694-1990 :PVC insulated cables for working voltage up to and including 1100V

IEC 60529 :Degrees of Protection provided by enclosures (IP Code)

JEC 62052-11 :Electricity metering equipment (a.c.) - General requirements, tests & test conditions

IEC 62053-22 : Static meter for active energy (Class 0.2S and 0.5S)

IEC 61850: Communication networks and systems in substations (all parts including IEC 61850-8-1, IEC 61850-9-2, 61850-8-2 Peer to peer communication)

IEC 60870-103-1 Communication Protocol

IEC 61869-9 :Digital Interface for Instrument Transformers

IEC 61869-13 : Stand-alone Merging Units

IEC 61588/IEEE : Precision clock synchronization protocol for networked measurement and1588v2 control systems

IEC 62351 : Power systems management and associated information exchange - Data andcommunications security

IS 2633-1986 :Test for uniformity of Zinc Coating

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	200 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL/TPNODL/TPSODL/TPWODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 200 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during thedry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS

- IEC 61850 : Offered devices shall be IEC61850 level A certified by KEMA.
- Relay manufacturer shall have more then 10 years of experience in design development and implementation of IEC 61850 based IEDs
- Offered devices shall be conformal coated with automatic conformal coating process based on global conformal coating standard.
- The supplier should have at least 10 years of experience in design, development and supply of control and protection systems for electricity transmission and distribution applications including in house development of necessary hardware and software for IEC 61850 based IEDs.
- The manufacturer, whose protection system is offered, should have designed, manufactured, tested, installed and commissioned such a system for electricity transmission and distribution for at least five years.
- The manufacturer needs to submit the proof of completing such tasks with other utilities/concernsas its experience certificate.
- The Business Associate can offer an innovative and advanced system. The offer is subjected to an

approval from TPCODL/TPNODL/TPSODL/TPWODL after a thorough discussion between the BA and TPCODL/TPNODL/TPSODL/TPWODL in case, an approval is not awarded to the BA's offered innovative system, TPCODL/TPNODL/TPSODL/TPWODL's existing/desired infrastructure prevails and the BA shall provide the system accordingly.

- The BA should optimize on the cost of software products offered to TPCODL/TPNODL/TPSODL/TPWODL considering already available licenses with TPCODL/TPNODL/TPSODL/TPWODL. The BA should clearly indicate licensing policy for the software tools offered.
- The BA should provide necessary training to the personnel recommended by TPCODL/TPNODL/TPSODL/TPWODL to maintain the system and troubleshooting reports. (Minimum 3 days)
- The BA should provide the MIB Files of all Numerical Protection IEDs, Merging Units and GPS Clock to integrate the SNMP Traps with Network Management System
- The Business Associate can offer an innovative and advanced system. The offer is subjected to an approval from TPCODL/TPNODL/TPSODL/TPWODL after a thorough discussion between the BA and TPCODL/TPNODL/TPSODL/TPWODL. In case,an approval is not awarded to the BA's offered innovative system, TPCODL/TPNODL/TPSODL/TPWODL's existing/desired infrastructure prevails and the BA shall provide the system accordingly.
- The numerical relay must have an IEC 61850 Edition 1, Edition 2 level
- A certification from DNVGL / KEMA and Relay shall also support site selectable minimum RSTP.
- Relay manufacturer shall submit cyber security conformance statement for offered devices or device series.

4.2 General System Design

Protection and Control IEDs respond to the signals of currents and voltages
Design measured at certain points of the power system, and assess the state of the protectedpower system component. The System shall he suitable for operation and monitoring of the complete substation including future extensions and shall works on IEC 61850.

Conventionally, analog values are injected directly into the IFD through instrument transformers.IEDs combine analog-to-digital conversion of the signals with their analysis (digital filtering) and decision-making algorithms.

The IEC 61850 standard, which becomes more and more popular, allows digital exchange of data between merging units and protection devices. Merging Units (MUs), being an integral part of the digital substation, repeatedly digitize the analog signals and transfer them to the process bus as packets ensuring labelling and integrity of data during the transfer. The process bus represents acommunication network, interconnecting data publishers and subscribers. Protection and control IEDs receive digital packets and process currents and voltages. The transfer of the instantaneous values of currents and voltages is required for the performance of all range of functions available in the relays. Thus, protection and control devices connected to the process bus register electric processes as sampled signals of currents and voltages in the same way as if the analog-to-digitalconversion was carried out directly in the relay. The digital communication is realized through redundant RJ45.

According to IEC 61850-9-2LE, the packet transmitted includes one sample of each of the three phase currents and three phase voltages, as well as current and neutral voltage. Most filtering algorithms are designed for equal distribution of samples on the time axis and are very sensitive to the loss of even one of them, Under such conditions the relay must take special actions likecomputing the sample missed.

Packet delivery time drift leads to irregularities in the flow of data to the protection equipment and to cope with packet delays in the communication channel and to keep the required regularityof data processing, a buffer of samples is created, thus enabling delayed data delivery to the protection functions. Buffer time should provide for the maximum possible time of data deliveryin the communication channel without affecting the overall relay tripping time

It is important to ensure synchronous time-stamping of the samples using Precision Time Protocol (PTP). If the measuring equipment is not synchronized, the collected samples cannot be correctly aligned. The relay functions are then blocked, and an alarm condition is indicated to the maintenance personnel via Station Bus to the RTU/DC and to Integrated Network Management System.

The loss of connection with a MUs for the process bus in terms of its impact on the protection relay performance is similar to damage of current and voltage secondary circuits. Such a loss is detected after the packet delay exceeds a preset threshold, which enables a timely reaction of the relay. Therelay functions requiring data from the failed source are then blocked, and the loss of connection isindicated to the maintenance personnel via Station Bus to the RTU/DC and to Integrated NetworkManagement System.

Merging units shall perform the diagnostics of their state. In case of internal failure, samples are marked with a poor quality attribute according to IEC 61850, and each measurement has its own quality attribute. If a poor quality sample is received, protection and control functions depending onthis data are blocked, and the relay should inform the maintenance personnel via Station Bus to the RTU/DC and to Integrated Network Management System about the failure.

There shall be different login privileges, role based, for Protection Team and Automation Team toaccess all Protection IED.s and Merging Units.

Protection and control IED should be internal modular in design. By the term internal modularity means the cards of the relay should be housed inside with no exposure. By the term internal modularity it also means that there should be no conjunction with external IO devices by means of any fiber or any other cable or cable bus instead they should be an integral part of the main/ mother device by means of pin to pin configuration. No separate configuration tool will be allowed along with no proprietary communication between the devices. The device shall be flush mounted The draw out design should be such that there be no cards left in the relay after the draw out process and CT terminals of the casing gets automatically shorted as soon as the drawing out process is initiated. The IEDs temperature dissipation should be such that no intrusion of insects or any tiny living things is possible by any means. If the construction design is such then OEM needs to provide some additional arrangement to proof the intrusion of any tiny living things or its excretion. Every PCB in the IED should have conformal coating. All PCB used in relays should have harsh environmental coating as per standard IEC 60068 (HEC) to increase the particle repellency and thereby increasing the life of relay. Test report needs to be submitted. IED shall be manufactured using lead-free components.

Enclosure protection shall be IP54 from front and IP 20 from rear. All the necessary wirings to be terminated at the back of the relay with sufficient comfortable spacing so that wiring and testing becomes very easy for working personnel. All the terminals should be ring type. No terminals shall be vertically aligned looking from the straight rear of the IED.

Equipment shall be designed for a working life of at least fifteen years in the specified environment and application. Components, component ratings and all other factors determining equipment life shall take this into account. Normal routine and breakdown maintenance shall be assumed and it is accepted that certain consumable components and modules may need periodic replacement or adjustment. However, the Bidder shall state in his bid, the expected frequency of such replacement or adjustment and life expectancy.

The IED/ relay should have Protection functions with any settable magnitude of actuating electrical quantity and lowest time delay of 20 ms. The settings groups can be as much as 4 numbers as minimum.

Fascia:

The fascia of the IED should have a clear and bright LCD display where SLD can be seen clearly of the respective bay along with following parameters clearly from 1 meter distance

1. Name of the bay
2. Date and time running
3. CT ratio
4. All three phase current
5. All three phase voltage in phase to phase basis

The display should have minimum 4 pages to cater sequential values (positive, negative and zero) of voltages and current along with other important displayable parameters like total harmonic distortion of electrical parameters. Tactile keypad or navigation keys for browsing and setting the relay menu.
There should be user configurable LEDs (minimum 10) in the relay fascia for suitable annunciation

configuration as per site suitability. The LED marking style should not be permanent type, there should be LED strip which can be easily changed as per the need of the user. The LED strip required to be printed out (hard copy or software configured) to be provided. There should be a LED in green color to indicate device is working and healthy.
The relay fascia also should contain dedicated close and open button for CBs or any other switches which a user wish to control. Minimum number of such switches is 5 including CB which can be configured in the IED.
The front fascia of the IED should contain a communication port to get connected with the device. The details of the port feature will be given in the communication part.
There should a reset button which by default clears all the LEDs (programmable and non-programmable) and reset all the outputs in one go. If any button can be configured for the same purpose then same feature is also acceptable.

Inputs & Outputs:
The auxiliary input should be suitable for both 24V and 48V DC. The auxiliary input circuit shall be protected by surge protection device in the relay itself so that no external DC voltage or high AC voltage can damage the delicate PCB components.

The quantity of analogue input is 4 for both current and voltage. The current channel should be rated for both 5A and 1A. Necessary selection based on field input (1 or 5) to be made by selection through software. The short time current rating of the current coils to be mentioned by bidder and should not be less than 4 times for 1 sec. Conventionally, analog values are injected directly into the IED through instrument transformers. IEDs combine analog-to-digital conversion of the signals with their analysis (digital filtering) and decision- making algorithms. The sampling frequency should not be less than 32 samples/ cycle.
Suitable measures shall be provided to ensure that transients present in CT & VT connections due to extraneous sources in the HV system do not cause damage to the numerical and other IEDs. CT saturation shall not cause mal- operation of numerical IEDs.

The voltage inputs shall be such that at least one voltage coil be capable of withstanding phase to phase voltages, so that on need based “SYNC” function can be used.

The digital input shall be suitable for 24V and 48V DC application. The input card in the IED should have necessary surge protection circuit as mentioned above for auxiliary power supply card. The inputs shall be opto-coupler type. There should be minimum 3 number inputs having its own positive and negative terminals i.e. no common negative or positive terminal. There should be feature for digital/ binary input sensing delay in the relay which can be adjusted through the software and relay fascia.
Opto Coupler should work at 80% of rated operating Voltage.i.e.for 24V DC , it should work at 19.2VDC.

The digital output shall be suitable for 24V and 48V DC application. The outputs shall be free of potential type when they are not subjected any kind of external wiring. There should be minimum 4 power contacts to handle high current rating applications. The current rating of the power contacts to be provided by the bidder. Programming of outputs can be done freely both from software and relay fascia.
The device should have minimum 1 watchdog contact.

Note : For GIS Panel BI/BO requirement may be higher and OEM shall provide accordingly.
GIS Bus PT and Bus Earthing Switches shall have its control from BCPU of Bus Coupler CRP Only.

Diagnosis capability of IED :

- The numerical IEDs shall have continuous self-monitoring & cyclical test facilities. The internal clock of the system shall be synchronized through the GPS Time Synchronizing System to be provided by Owner at later date.
- Should tell about the internal and hardware problem by its diagnosis tool. The diagnosis tool may be the software for its configuration or other than configuration software.
- Forcing of all kinds of inputs and outputs.
- Forcing of all kinds of protection functions
- Forcing of all LED's.
- Relay should be reboot from the relay key and through software also
- Diagnosis tool/ software to declare pattern of failure or pre failure conditions
- List of frequent failure error codes and their meaning and proper preventive action

Oscillography:

- Waveform generation option shall be different (On which functions waveform will be generated shall be selected by user)
- What an waveform will show shall be different from above (Including all current channels and voltage channels, digital channels minimum 24)
- Transformer differential relay should have all HV and LV analogue channels, biasing current, restraint current.
- Phasor with sequential values
- Sequential values in any representation (value in A, V or percentage of positive sequences)
- With two or more cursor availability in DR software to facilitate clear demarcation of pre fault, fault and post fault behavior.
- Transient play back facilities in the IED software Any configurable protection characteristics
- Any program generated output Any DI & DO
- Any program generated input
- Store Any waveform even if dc fails. Any goose sending signals
- Any goose receiving signals
- The oscillogrphic record can be exported to comtrade format. Nature of storage is FIFO minimum 20 sec (configuration should be possible as per user selectable choice like window for the record, number of records etc.)

System Events:

- 600 Events minimum Time resolution of 1ms
- Can be read from relay fascia as well as from software.
- Events of a single change be it bi, bo, program generated IP, OP, protection signal, GOOSE signals etc to be either automatically come or user configurable.
- Events should be downloadable from front and back ports with out changing a single configuration of the device
- All event shall be readable from relay fascia also.
- Fault events are different than system events and shall be downloadable from relay fascia as well as from software.

Software:

- Maximum number of software to interface with relay will be 2 in number to engineer relay from device and IEC 61850 system point of view. These 2 number software required for device configuration, system configuration of IED, waveform uploading/ downloading/ viewing.
- Device engineering and IEC 61850 system configuration to be done from the same software

- Software to have every function of configuration and parameterization that is available from relay fascia
- Device to have minimum 3 level of security with user ID and password protection to access device from configuration, parameterization, accessibility, 61850 configuration & event or oscillography downloading
- Software restart facility for the device
- Software testing facility for the device (when device is protecting, necessary point to point testing can be done by simulating wanted signals from software.
- The relays provided should comply with Indian or international standards of cyber security like NERC CIP / BDEW / IEEE 1686 or equivalent for cyber security to provide protection against unauthorized disclosure, transfer, modification, or destruction of information and/or information systems, whether accidental or intentional.
- There should also be separate logic in IED to cater breaker operation counter on faults only. This counter should not be reset to zero upon device rebooting or accidental relay power off.
- On resetting the BCPU/PU from SCADA or Locally from relay all the protection signals must be get reset both at SCADA and at relay with relay outputs in one go. If separate logics required to meet the same, then same can be formulized.
- Device order code of 11kV IEDs (BCPUs & PUs) must have same order codes irrespective of panel types for better IEC61850 project management and one to one replacement. For 11kV panels both BCPU and PU order code will be the same. Device order code of 33kV BCPUs must have same order code for better IEC 61850 project management and one to one replacement.
- The bidder shall provide Any software licenses for Any the software being used in Protection IED offered for engineering, IED setting uploading and FDR down loading etc. The license shall be provided on a site license basis and shall be valid for the plant / Equipment life cycle. In the case of anti-virus software, the license all include regular updates. The Bidder All guarantee that Any software are defect free and meet the System specifications, and undertake to fix any d vfvefects Which may arise during the life of the system at no cost to the Owner.
- Any software versions in components all be the latest official releases as on the date of shipment from works and all include Any software updates etc. released till that date. A certificate to this effect all be furnished by the bidder at the time of pre-dispatch inspection for each software package. Any new software revisions and/or patch updates that are released before the end of the warranty period which addresses system defects all be implemented on site and the system re-tested to validate system integrity by the bidder at no cost to the owner (This excludes new revisions which provides additional functionality). The bidder all periodically inform the designated officer of the Owner about software updates / new releases that would be taking place after the system is commissioned.
- Bidder all train our engineers to guide the upgrading procedures of project files with respect to latest releases.
- Two nos. of communication cords for each type of relay uploading and down loading data from front and rear port of Protection IED all be supplied by the bidder. One no. of Serial to USB Converter to be supplied by bidder.
- Station Project Files all be ready before raising inspection call & submission of the internal test report by the Bidder.
- Bidder all submit 2 copies of as built drawings & station project files in soft format in a pen drive.
- The technical key should be as per provided SLD like 11KVIC2, 33KVIC1, 33KVPTR2 etc. The same shall be elaborated at the stage of detailed engineering and finalization of order code.
- Report control blocks to be configured during initial programming of the relays. The desired signals and their types will be provided in detailed engineering stage.
- IP address will be provided along with SNTP sever address at the time of detailed engineering
- CT PT ration to be provided at the time of detailed engineering
- Successful bidder will ask user on which software platform necessary relay files will be made, it's not in scope of bidder, however bidder may suggest.
- All protection functions and control functions to be made off with appropriate settings adopted discussed in detailed engineering stage.
- Bidder to propose type of IEDs (like latest released version) they are providing at the time of detailed engineering.
- There should be feature for digital/ binary input sensing delay in the relay which can be adjusted through the software and relay fascia.

- Transient play back facilities in the IED software
- Virtual simulation of all kinds of inputs and outputs (while relay is online and working and in service)
- Virtual simulation of all kinds of protection functions (while relay is online and working and in service)
- Virtual simulation/ forcing of all Led's (while relay is online and working and in service)
- Relay should be reboot from the relay key and through software also
- The number of program generated input and output to be framed by bidder. Minimum number for both are 32 respectively.
- The number of Goose input and output to be framed by bidder, however minimum number for both are 20 respectively.
- Protection and Control IEDs respond to the signals of currents and voltages measured at certain points of the power system, and assess the state of the protected power system component. The System shall be suitable for operation and monitoring of the complete substation including future extensions and shall works on IEC 61850. The device shall be freely configurable to both IEC 61850 edition 1 and edition 2. The device shall be capable to report to 6 clients minimum.
- It should be compatible with SCL/SCD files generated by a third-party system.
- Being new installation or retrofitting activity there should be always presence of OEM engineer though OEM or any party may put in third party for the said job.

SNMP

Shall be made available in each IED.

- The IED should be communicated by remote servers through the gateway configured in the IED.
- Web HMI should be made available in the relay so that relay can be accessed from remote from computer browser.
- The web HMI should facilitate every possible access which can be done from relay fascia
- In the relay front there shall be a must control authority in terms of LOCAL and REMOTE either by lock and key or by any fascia button (which can also be initiated by Binary or digital input) so that on choosing LOCAL it does not accept any remote command.

4.3 Protection and Control Philosophy:

Major Components as Follows:

4.3.1 Feeder Protection Relay (Dir O/C & E/F Relay)

Protection Functionalities shall be as follows:

- Non Directional (50/51 & 50N/51N) & Directional O/C and E/F (each element shallhave one IDMTL and three high set definite time relay) (67 R, Y, B and 67N)
- Negative sequence current (unbalance current) (46)
- Overload relay (49)
- VT supervision relay and Trip circuit supervision relay.
- Integrated CB failure protection.
- Configurable LEDs shall be provided to indicate the IED operation and the alarm /status change of a bay equipment e.g. Phase Fault operated / Earth Fault operated / CB Open / CB Close / Spring charged etc.
- Auto Reclose (79) Protection element feature to be incorporated.
- The LED should have Circuit Breaker monitoring >1 KA square for online monitoring Breaker
- Synch-check functionality.
- The IED should have Graphical Display Unit to display bay level information
- Electrically reset type high speed, heavy duty relay (master trip 86) shall be used for

tripping on operation of main and BCPU IEDs. The two trip coils whereever provided shall be provided with independent potential free contacts from different fused DC supplies. The trip relay shall be supervised. Master trip relay should be such that on resetting its flag should be automatically reset.

- Breaker counter logic shall be there on fault opening
- The IED must have broken conductor and fault locator facility
- IED of Bus Coupler/Bus Section Bay should have minimum of 15 Digital Inputs and Digital Output Channels for Substation and other Aux. Signals
- Reverse blocking and CB FP shall be implemented for all I/C & O/G Breakers.
- Auto recluse (79) Protection element feature to be incorporated in the IED.
- The IED shall provide all necessary interlocking for Grid station within the bay.
- The IED should have Circuit Breaker Health Monitoring (Cumulative I2t)

- **No of DI :20**
- **No of DO:10**

4.3.2 Transformer Protection Relay

i. The IED shall have biased current Differential protection with REF, SEF and Directional O/C & E/F protection. It should include the following features:

- Vector group compensation.
- CT ratio correction.
- Biased differential protection.
- High-set. Element of suitable setting range
- 2nd and 5th Harmonic restrains

ii. Transformer trouble alarm/ Trip e.g. Bucholz PRO / Winding Temp / Oil Temp etc. shall be taken as binary inputs through aux relays to the differential IED as a common input indicating "Transformer trouble" . However, auxiliary Flag relays / TMU (Transformer monitoring unit) shall be provided independently for Transformer trouble and trip along with the panel.

- **No of DI :16**
- **No of DO:10**

4.3.3 Capacitor Protection Relay

A dedicated high speed Numerical Current operated Neutral Unbalance / Displacement IED with Provision oftwo stages of definite time elements shall be provided as Main Protection.

IED shall be able to display all the Alarms and field status change on the LCD panel of the IED at the time ofoccurrence and it should be possible to accept the alarms locally from the IED and through the station controller PC.

- **No of DI :16**
- **No of DO:10**

In addition to protective relays, there are other components comprising of but not limited to:

4.3.4 Master Trip Relay (86)

Electrically reset type high speed, heavy duty relay (master trip relay 86)) shall be used for tripping on operation of protection IEDs.Trip relay along with tripping circuit shall be supervised. Master trip relay should be such that on resetting its flag should be automatically reset.

Number of potential free contacts: 6NO + 2NC

Preferred Make & Model : ABB/GE

4.3.5 DC Supervision Relay

DC operated Auxillary Relay for DC Supply Supervision .

Aux Voltage : 24/48 VDC Based on System Control voltage.

Number of potential free contacts: 1NO + 2NC

Preferred Make & Model : ABB/GE

4.3.6 Trip Circuit Supervision Relay

For Pre & Post Close Supervision (2 Trip Circuits)

Number of potential free contacts: 1NO + 2NC

Aux voltage : 24/48 VDC Based on System Control voltage.

Preferred Make & Model : ABB/GE

4.3.7 Aux Relay for transformer Protection (Applicable for Transformer CRP Only)

Two Element Aux relay for Transformer Protection

- OTI Trip & Alarm
- WTI Trip & Alarm
- Buchholz Trip & Alarm
- PRV Trip
- MOG Alarm
- OLTC PRV Trip
- OSR Trip

Number of potential free contacts: 3 NO

Aux voltage : 24/48 VDC Based on System Control voltage.

Preferred Make & Model : ABB/GE

4.3.8 Multi Function Meter

For measurement and display of Voltage, Current, Power and Power Factor.

4.3 Selection of IED for Control & Relay Panel

(A) 33kV/11kV Power Transformer CRP

CRP for Transformer shall be provided with two Protective Relays:

a) **Main Protection:** As per clause 4.3.2

b) **Back-up Protection:** As per clause 4.3.1

(B) 11 KV Feeder, Incomer, BC CRP

CRP for Feeder shall be provided with one Protective Relays.

It shall be as per clause 4.3.1

(C) 33 KV Line CRP

CRP for Feeder shall be provided with one Protective Relays.

It shall be as per clause 4.3.1

(D) 11KV Capacitor CRP

CRP for Feeder shall be provided with Two Protective Relays.

a) Main Relay : It shall be as per clause 4.3.3

b) Backup Relay : It shall be as per clause 4.3.1

Automatic power factor controller module embedded in the IED for auto switching of breaker shall take into consideration the bus voltage & pf. 11KV I/C current Input to the Neutral current unbalance IED shall be from CT installed on the connection between two star points of the capacitor bank. Electrically reset type high speed relay shall be used for tripping & the trip relay shall be supervised.

4.4 Detailed Requirement of Hardware & Software of the Numerical Protection IEDs:

i. All numerical IEDs, auxiliary IEDs and devices comprising the Bay Protection Units shall be of types, proven for the application, satisfying the requirements specified in technical specifications and shall be subject to the Owner's approval. Numerical IEDs shall have appropriate setting ranges, accuracy, resetting ratio, transient overreach and other characteristics to provide the required sensitivity to the satisfaction of the Owner.

ii. All IEDs must have conformal coating for protection against harsh environments.

iii. Bidder shall provide necessary certificates to ascertain the communication capability (Interoperability) with other make LED in 61850 standard for interlocks/logic through GOOSE messaging. The relays provided for any project must have self-diagnostic feature to enable us to know about component failure. if not possible then necessary software to detect the same must be provided.

iv. Equipment shall be designed for a working life of at least fifteen years in the specified environment and application. Components, component ratings and all other factors determining

equipment life shall take this into account. Normal routine and breakdown maintenance shall be assumed and it is accepted that certain consumable components and modules may need periodic replacement or adjustment. However, the Bidder shall state in his bid, the expected frequency of such replacement or adjustment and life expectancy.

v. Numerical IEDs shall be suitable for efficient and reliable operation of the protection scheme. The necessary auxiliary relays, trip relays, etc. required for complete scheme, interlocking, alarm, logging, etc. shall be provided. No control IED, which shall trip the circuit breaker when the IED is de-energized, shall be employed in the circuits. Any connectors, terminals, switches required to extend or isolate the wiring to IEDs to be provided by bidder.

vi. IEDs shall be provided with self-reset contacts except for the trip lockout, which shall have contactswith an electrical reset feature.

vii. Suitable measures shall be provided to ensure that transients present in CT & VT connections due toextraneous sources in the HV system do not cause damage to the numerical and other IEDs. CT saturation shall not cause mal-operation of numerical IEDs.

viii. Hardware selection should be done in such a manner that all power supply requirements could be met with the available grid voltages (24VDC/48V DC for grid station).

ix. DC batteries in protective IEDs necessary for IED operation shall not be acceptable. Equipment shallbe protected against voltage spikes in the auxiliary DC supply. Auxiliary supply supervision and necessary alarm generation to SCADA be possible.

x. The numerical IEDs shall have continuous self-monitoring & cyclical test facilities. The internal clock of the system shall be synchronized through the GPS Time Synchronizing System to be provided byOwner at later date.

xi, Each numerical IED shall have a serial interface on the front for local communication to Personal Computer and Printer. Facilities shall be provided to access each discrete protection function including modification in IED settings and monitoring of. the IED from a HMI. A print out of all settings, scheme logic, event records etc. shall be accessible through the HMI. The display of various measured parameters during normal as well as fault conditions on a segregated phase basis shall be provided. LEDs and a backlit LCD screen shall be provided for visual indication and display of messages related to major trips / alarms. Necessary multilevel password protection shall be provided.

xii. The sampling rate of analog inputs, the processing speed and processing cycle of digital values shall be selected so as to achieve the operating times of various protection functions specified. In case the Bidder does not have all the protection functions specified as a part of the standard numerical IED, separate discrete numerical IEDs can be provided for such protection. The reasons for providing such discrete IEDs shall be clearly outlined in the bid.

xiii. The numerical IEDs shall be provided with built-in disturbance recording functionality. The data from DR function shall be available in IEEE/COMTRADE format and shall be compatible with the dynamic IED test system being supplied under this Contract.

xiv. The manufacturer of the numerical protection system offered shall carry out the complete engineering, testing and commissioning on site of the offered protection equipment including the associated IEDs and protection panels. The testing and commissioning protocols for the numerical

protection systems offered shall be approved by the owner before commissioning on site.

xv. The numerical IEDs offered shall have self-diagnostic features to reduce the down time of the IED and to provide useful diagnostic information upon detection of an internal fault so as to speed up the maintenance. The necessary support documentation explaining in detail the self-diagnostic features of the numerical IEDs shall be furnished for the Owner's use, Self-diagnostic feature to meet clause 7.1.2.4 of IEC 61850-4.

xvi. There should also be separate logic in IED to cater breaker operation counter on faults only

xvii. PRP/RSTP to be made available by default in relay with dual RJ45 or dual FO Port.

xviii. Fault currents sensed by relay to be.mapped to SCADA. Proper programming to be done for the same.

xix. All the protection signals along with corresponding LEDs to be latched at SCADA, so suitable logic to be built in the relay.

xx: On resetting the BCPU/PU from SCADA or Locally from relay all the protection signals must be getreset both at SCADA and at relay with relay outputs in one go. if separate logics required to meet the same, then same can be formulized.

xxi: Device order code of 11kV IEDs (BCPUs & PUs) must have same order codes irrespective of panel types for better IEC61850 project management and one to one replacement. For 111(V panels both BCPU and PU order code will be the same. Device order code of 33kV & 11kV BCPUs must have same order code for better IEC 61850 project management and one to one replacement.

The bidder shall provide all software licenses for all the software being used in Protection IED offered for engineering, IED setting uploading and FDR downloading etc. The license shall be provided on a site license basis and shall be valid for the plant / Equipment life cycle. In the case of anti-virus software, the license shall include regular updates. The Bidder Shall guarantee that all software are defect free and meet the System specifications, and undertake to fix any defects Which may arise during the life of the system at no cost to the Owner.

xxv. In case offered IEDs require any additional software for its integration to RTU then the bidder shall provide the same.

xxvi. All software versions in components shall be the latest official releases as on the date of shipment from works and shall include all software updates etc. released till that date. A certificate to this effect shall be furnished by the bidder at the time of pre-dispatch inspection for each software package. All new software revisions and/or
patch updates that are released before the end of the warranty period which addresses system defects shall be implemented on site and the system re-tested to validate system integrity by the bidder at no cost to the owner (This excludes new revisions which provides additional functionality). The bidder shall periodically inform the designated officer of the Owner about software updates / new releases that would be taking place after the system is commissioned.

xxvii. Bidder shall train our engineers to guide the upgrading procedures of project files with respect to latest releases.

xviii. Two nos. of communication cords for each type of relay uploading and clown loading

data from front and rear port of Protection IED shall be supplied by the bidder. One no. of Serial to USE Converter to be supplied by bidder.

xxix. Station Project Files shall be ready before raising inspection call & submission of the internal testreport by the vendor

xxx. Vendor shall submit 2 copies of as built drawings & station project files in soft format.

4.5 GPS Clock

The offered GPS Clock should meet the following requirements:

- Redundant GPS based Time Synchronization Server with Antenna
- Tracking: 12 Satellites in parallel
- LCD Display with Status LED's
- Redundant Ethernet Port
- NTP v2/v3/v4
- IPv4, IPv6, UDR, TCP, SNMP, SSH, SCP, HTTP, HTTPS, SYSLOG, Telnet, FTP networkingprotocols
- Remote Alarm notifications via SNMP, SYSLOG
- Remote configuration using SSH, Web, SNMP, Telnet
- USB Port
- Supports synchronization of IFC61850 compliant devices via NTP/SNTP/PTP protocol
- Mounting Type: 19" Rack Mountable
- NTP Client Synchronization software
- Diagnostic Relay outputs
- Supporting Timing Protocols:
  - (a) NTP/SNTP
  - (b) PTP v2
  - (c) IRIG-B Modulated
  - (d) IRIG-E3T11
- Power Supply: Redundant, 48VDC ± 15% or 220VDC ± 15%
- Operating Temperature: 0° C to +55° C
- Alarms:
  - (a) GPS Lost
  - (b) Watchdog
  - (c) Power Fail
- Antenna: Coaxial Cable with 360 Degree Coverage

4.17 Fibre Optic Cable (Optional)

Between Control Room and Switchyard/Switchgear Room: 4 Core, 62.5/125 micro metre Multi-mode, Loose tube, Jelly filled,Armoured Fibre optic cable within Control Room: 2 Core, 623/1251.tm Multi-mode Fiber Optic Patch Chord.

4.18 CAT-VI

4 Pairs, 23 AWG Solid Bare Copper Conductor, PE Insulation, Unshielded Twisted Pair (UTP) with

separatorand PVC Outer Jacket
It should be designed to the ANSI/TIA-568-C.2 ISO IEC 11801 Category 6 requirements and transmit data at 1000 M bps (-1 Gigabit per second} with a frequency of 250 MHz and suitable for 1OBASE-T, 100BASE-TX Fast Ethernet and 1000BASE-T 100013ASE-TX (Gigabit Ethernet).

4.19 Energy meter

Tier wise provision for installation of Revenue type Smart Energy meter to be provided C&R Panel including the TTB & other related items.

5 GENERAL CONSTRUCTIONS

General Construction of CRP

5.1 Panel Arrangement

Panel shall be 3 tier for feeder protection and 2 tier for transformer protection.
Each Tier shall have independent Door with locking arrangement
Cable Alley shall be on Left/Right Side of CRP.
There shall be no rear access.

Panel with Water and Dust proof design shall consist of a vertical front panel with Relays, Meters, mounted on Inner Door thereon and having wiring access from Front for control panels. In case of panel having width equal to or more than 1000mm, and height of 2200mm Single leaf-doors shall be provided on front and two leaf doors on back side. Doors shall have handles with either built-in locking facility or will be provided with pad-lock.

5.2 Constructional features

Design must be Type Tested for Ingress Protection.

It is the responsibility of the BA to ensure that the equipment specified and such unspecified complementary equipment required for completeness of the protective/control schemes is properly accommodated in the panels without congestion and if necessary, provide panels with larger dimensions. No price increase at a later date on this account shall be allowed. However, the width of panels that are being offered to be placed in existing switchyard control rooms, should be in conformity with the space availability in the control room.

Panels shall be completely metal enclosed and shall he dust, moisture and vermin proof. The enclosure shall provide a degree of protection not less than **IP-55** in accordance with IS: 2147. Panels shall be free standing, floor mounting type and shall comprise structural frames completely enclosed with specially selected smooth finished, cold rolled sheet steel of thickness not less than 3 mm for weight bearing members of the panels such as base frame, front sheet and door frames, and 2.0mm for sides, door, top and bottom portions. There shall be sufficient reinforcement to provide level transportation and installation. All doors, removable covers and panels shall be gasketed all around with synthetic rubber gaskets Neoprene/EPDIV1 generally conforming to provision of IS 11149.

However, XLPE gaskets can also be used for fixing protective glass doors. Ventilating louvers, if provided shall have screens and filters, The screens shall be made of either brass or GI wire mesh. Design, materials selection and workmanship shall be such as to result in neat appearance, inside and outside with no welds, rivets or bolt head apparent from outside, with all exterior surfaces tune and smooth. Panels shall have dual exhaust fan for dissipation of heat.

Panels shall have base frame with smooth bearing surface, which shall he fixed on the embedded foundation channels/insert plates. Anti-vibration strips made of shock absorbing materials that shall be supplied by the contractor, shall be placed between panel of base frame, Cable entries to the panels shall be from the bottom. Cable gland plate fitted on the bottom of the panel shall he connected to earthing of the panel/station through a flexible braided copper conductor rigidly.
Relay panels of modern modular construction would also be acceptable.

5.3 Mounting

All equipment on and in panels shall be mounted and completely wired to the terminal blocks ready for- external connections. The equipment on front of Inside Secondary Door shall he mounted flush. Equipment .shall be mounted such that removal and replacement can be accomplished individually without interruption of service to adjacent devices and are readily accessible without use of special tools. Terminal marking-on the equipment shall be clearly visible.

The BA shall carry out cut out, mounting and wiring of the free issue items supplied by others which are to be mounted in his panel in accordance with the corresponding equipment manufacturerdrawings. Cut outs if any, provided for future mounting of equipment shall be properly blanked off with blanking plate.
The centre lines of switches, push buttons and indicating lamps shall be not less than 750mm from the bottom of the panel. The centre lines of relays, meters and recorders shall be not less than 450mm from the bottom of the panel.
The centre lines of switches, push buttons and indicating lamps shall be matched to give a neat and uniform appearance. Likewise the top lines. of all meters, relays and recorders etc. shall be matched.

No equipment shall be mounted on the doors. At existing stations panels shall be matched with other panels in the control room in respect of dimensions, colour, appearance and arrangement of equipment (centre lines of switches, push buttons and other equipment) on the front of the panel.

5.4 Panel internal Wiring

There should be proper segregation of TB, Fuse and other instruments in tier wise grouping.
Panels shall be supplied complete with interconnecting wiring provided between all electrical devices mounted and wired in the panels and between the devices and terminal blocks for the devices to be connected to equipment outside the panels. When panels are arranged to be located adjacent to each other all inter panel wiring and connections between the panels shall be furnished and the wiring shall be carried out internally, this is in the BA's scope.
All wiring shall be carried out with 1100V grade, single core, stranded copper conductor wires with

PVC insulation. The minimum size of the multi-stranded copper conductor used for internal wiring shall be as follows:

Internal wiring to be connected to external equipment shall terminate on terminal blocks.

The terminal blocks for CTs VT's shall be provided with test links and isolating facilities, The CT terminal blocks shall be provided with short circuiting and earthing facilities.

Shall have 20% terminals as spare terminals in each panel. All equipment mounted on front of the panels shall have individual name-plates with equipment designation engraved. Each panel shall also have circuit/feeder designation name plate.

All wiring shall be with 1100 V grade, single core, PVC insulated stranded copper conductor.

Wires shall be vermin proof. Minimum size of conductor shall be 2.5 sq. mm in general, but for CT & VT.

Contractor shall be solely responsible for completeness and correctness of all the wiring, and for proper functioning of the connected equipment.

Specification for Auxiliary relays /MCB's

- Fuse Failure relay and trip Circuit Supervision relay shall be suitably selected, considering burdenand auxiliary voltage. External circuitry like compensating resistances will not be accepted.
- Auxiliary contact multiplier relays should be of reputed make and selected on the basis of continuous current carrying capacity and rated voltage. The fluctuation in voltage level must be accounted for (+/-) 10% continuously.
- DC MCB's should not be substituted by AC MCB's for DC-Distribution, irrespective ofmanufacturer's individual multi usage Recommendations.
- DC Fail Supervision relay (80) shall be provided on all control and IED panels.

Spare I/Os wiring shall be brought upto terminal block for future use.

All internal wiring shall be securely supported, neatly arranged, readily accessible and connected to equipment terminals and terminal blocks. Wiring gutters & troughs shall be used for this purpose. Auxiliary bus wiring for AC and DC supplies, voltage transformer circuits, annunciation circuits and other common services shall be provided near the top of the panels running throughout the entire length of the panels.

Wire termination shall be made with solder less crimping type and tinned copper lugs, which firmly grip the conductor. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification plastic ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wire and shall not fall off when the wire is disconnected from terminal blocks. All wires directly connected to trip circuit breaker or device shall be distinguished by the addition of red coloured un lettered ferrule .

Longitudinal troughs extending throughout the run length of the panel shall he preferred for inter panel wiring. Inter-connections to adjacent panel shall be brought out to a separate set of terminal blocks located near the slots of holes meant for taking the inter-connecting wires

BA shall be solely responsible for the completeness and correctness of the internal wiring and for the proper functioning of the connected equipment.

5.5 Terminal Blocks

All internal wiring to be connected to external equipment shall terminate on terminal blocks. Terminal blocks shall be 1100 V grade and have 10 Amps. Continuous rating, moulded piece, complete with insulated barriers, stud type terminals, washers, nuts and lock nuts. Markings on the terminal blocks shall correspond towire number and terminal numbers on the wiring diagrams. All terminal blocks shall have shrouding with transparent unbreakable material.

Disconnecting type terminal blocks for AC/DC, current transformer and voltage transformer secondary leads shall be provided. Also current transformer secondary leads shall be provided with short circuiting and earthing facilities.

At least 20% spare terminals shall be provided on each panel and these spare terminals shall be uniformlydistributed on all terminal blocks.

Unless otherwise specified, terminal blocks shall be suitable for connecting the following conductors of external cable on each side

- All CT & PT circuits: minimum of 2.5 sq. mm copper. (FRLS)
- AC/DC Power Supply Circuits: 2.5 sq. mm Copper. (FRLS)
- All other circuits: 2.5 sq. mm Copper. (FRLS)
- Control Circuit: 2.5 sq. mm Copper. (FRLS)

There shall be a minimum clearance of 250 mm between the first row of terminal blocks and the associatedcable gland plate or panel side wall. Also the clearance between two rows of terminal blacks edges shall be minimum of 150mm.

Arrangement of the terminal block assemblies and the wiring channel within the enclosure shall be such that arow of terminal blocks is run in parallel and close proximity along each side of the wiring-duct to provide for convenient attachment of internal panel wiring. The side of the terminal block opposite the wiring duct shall he reserved for the Owner's external cable connections. All adjacent terminal blocks shall also share this field wiring corridor. All wiring shall be provided with adequate support inside the panels to hold them firmly and to enable free and flexible termination without causing strain on terminals.

The number and sizes of the TPCODL/TPNODL/TPSODL/TPWODL s multi core incoming external cables will be furnished to the BA after placement of the order. All necessary cable terminating accessories such as gland plates, supporting clamps & brackets, wiring troughs and gutters etc. (except glands & lugs) for external cables shall be included the scope of supply.

5.6 Painting

All sheet steel work shall be phosphate in accordance with the IS: 6005 "Code of practice for phosphate iron and steel". It should follow the seven tank process. Oil, grease, dirt shall be

thoroughly removed by emulsion cleaning. Rust and scale shall he removed by pickling with. dilute acid followed by washing with running water rinsing with a slightly alkaline hot water and drying. After phosphating, thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying. The phosphate coating shall be sealed with application of two coats of ready mixed, staved type zinc chromate primer. The f irst coat may be "flash dried" while the second coat shall be staved. Thereafter an established painting procedure like electrostatic painting followed for powder coating the panel. The colour shade shall be Siemens grey RAL 7032.

5.7 Miscellaneous Accessories

Plug Point: 24011, Single phase 50Hz, AC socket with switch suitable to accept 5 Amps and 15Amps pinround standard Iridian plug, shall be provided in the interior of each cubicle with ON-OFF switch.

Interior Lighting: Each panel shall be provided with an LED: lighting fixture rated for 240 Volts, single phase, 50 Hz supply for the interior illumination of the panel controlled by the respective panel door switch.

Switches and Fuses: Each panel shall be provided with necessary arrangements for receiving, distributing and isolating of DC and AC supplies for various control, signaling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with miniature circuit breakers (MCB). Selection of the main and sub-circuit MCB rating shall be such as to ensure selective clearance of sub-circuit faults. MCBs shall confirm to IS: 13947. Each IVICB shall be provided with one potential free contact and thesame shall be wired for annunciation purpose. However voltage transformer circuits for relaying and metering shall be protected by fuses. All fuses shall he HRC cartridge type conforming to IS: 13703 mounted on plug-in type fuse bases.. Fuse carrier base as well as MCBs shall have imprints of the fuse `rating' and 'voltage'.

Space Heater: Each panel shall be provided with a space heater rated for 240V, single phase, 50 Hz Ac supply for the internal heating of the panel to prevent condensation of moisture. The fittings shall be complete with switch unit.

5.8 Earthing: All panels shall be equipped with an earth bus securely fixed. Location of earth bus shall ensure no radiation interference for earth systems under various switching conditions of isolators and breakers. The material and the sizes of the bus bar shall be at least 25 X 6 sq. .mm perforated copper with threaded holes at agap of 50mm with a provision of bolts and nuts for connection with cable armors and mounted equipment etc for effective earthing, When several panels are Mounted adjoining each other, the earth bus shall be made continuous and necessary connectors and clamps for this purpose shall be included in the scope of supply of the Contractor. Provision shall he made for extending the earth bus bars to future adjoining panels on either side.
Provision shall be made on each bus bar of the end panels for connecting Substation earthing grid. Necessary terminal clamps and connectors for this purpose shall be included in the scope of supply of BA.

All metallic cases of relays, instruments and other panel mounted equipment including gland plate, shall be connected to the earth bus by copper wires of size not less than 2.5 sq, mm. The colour code of earthing wires shall he green.

Looping of earth connections, which would result in loss of earth connection to other devices when the loop is broker, shall not be permitted. However, looping of earth connections between equipment to provide alternative paths to earth bus shall he provided.

VT and CT secondary neutral or common lead shall be earthed at one place only at the terminal blocks wherethey enter the panel. Such earthing shall be made through l inks so that earthing may be removed from one group without disturbing continuity of earthing system for other groups.

5.9 Switches

Control and instrument switches shall be rotary operated type with escutcheon plates clearly marked to show operating position and circuit designation plates and suitable for f lush mounting with only switch front plate and operating handle projecting out.

The selection of operating handles for the different types of switches shall be as follows:

- Breaker, Isolator: Pistol grip, black control switches
- Selector switches: Oval or knob, black
- Instrument switches: Round, knurled, black

The control switch of breaker and isolator shall be of spring return to neutral type. The switch shall havespring return from close and trip positions to "after close" and "after trip" positions respectively.

Instrument selection switches shall be of maintained contact (stay put) type. Ammeter selection switches shall have make-before-break type contacts so as to prevent open circuiting of CT secondary when changing the position of the switch. Voltmeter transfer switches for AC shall be suitable for reading all line- to-line and line-to-neutral voltages for non-effectively earthed systems and for reading all line to line voltages for effectively earthed systems.

Lockable type of switches which can be locked In particular positions shall be provided when specified. The key locks shall be fitted on the operating handles.

The contacts of all switches shall preferably open and close with snap action to minimize arcing. Contacts ofswitches shall he spring assisted and contact faces shall be with rivets of pure silver or silver alloy. Springs shall not be used as current carrying parts

The contact combination and their operation shall be such as to give completeness to the interlock andfunction of the scheme.

The contact rating of the switches shall be as follows:

Description	24 VDC	48 VDC
Make and Carry	10	10
Continuously Make and Carry for 0/5 Sec	30	30
Break for resistive Load	3	20
Inductive Load for L/R=40ms	0.2	

5.10 Indicating Lamps

Indicating lamps shall he of cluster LED type suitable for panel mounting with rear terminal connections.Lamps shall be provided with series connected resistors preferably built in the lamp assembly. Lamps shall have translucent lamp covers to diffuse lights colored red, green, amber, dear white or blue as specified The lamp cover shall be preferably of screwed type, unbreakable and moulded from heat resisting material.
The lamps shall be provided with suitable resistors. Lamps and lenses shall be interchangeable and easily replaceable from the front of the panel. Tools, if required for replacing the bulbs and lensesshall also be included in the scope of the supply.
The indicating lamps with resistors shall withstand 120% of rated voltage on a continuous basis.

LED Colour shall be as follows:
CB Open :Green
CB Closed : Red
CB Spring Charged: Blue
Auto Trip: Amber
TCS: White
R,Y,B Phase Healthy : Red/Yellow/Blue

6. MARKING

All equipment mounted on front side as well as equipment mounted inside the panels shall be provided with individual name plates with equipment designation engraved. Also on the top of each panel on front side, large and bold nameplates shall be provided for circuit/feeder designation.
All front mounted equipment shall also be provided at the rear with individual name plates engraved with tag numbers corresponding to the one shown in the panel internal wiring to facilitate easy tracing of the wiring.

Each IED and meter shall be prominently marked. All relays- and other devices shall be clearly marked withmanufacturer' s name, manufacturer's type, serial number and electrical rating data. Name Plates shall be made of anodized aluminium. Name plates shall be black with white engraving lettering. Each switch shall bear clear inscription identifying its function e.g. 'BREAKER"52A', "SYNCHRONISING" etc. Similar inscription shall also be provided on each device whose function is not other-wise identified. If any switch device does not bear this inscription separate name plate giving its function shall be provided for it. Switch shall also have clear inscription for each position indication e.g. "Trip- Neutral-Close", "ON-OFF% "R-Y-B-OFF" etc.

All the panels shall be provided with name plate mounted inside the panel bearing PO No & Date, Name ofthe Substation & feeder and reference drawing number,

7. TESTS

Factory Acceptance Test:
The manufacturing phase of the C&R Panel shall be concluded by the factory acceptance test (FAT).

The purpose is to ensure that the Contractor has interpreted the specified requirements correctly and that the FAT includes checking to the degree required by the user. The general philosophy shall be to deliver a system to site only after it has been thoroughly tested and its specified performance has been verified, as far as site conditions can be simulated in a test lab. If the FAT comprises only a certain portion of the system for practical reason, IED Configuration and Database shall be prepared completely as per actual site requirement and it will submit to TPCODL/TPNODL/TPSODL/TPWODL for validation. An integrated-FAT shall be conducted as per the TPCODL/TPNODL/TPSODL/TPWODL Guidelines. If the complete system consists of parts from various suppliers or some parts are already installed on site, in such case supplier will arrange the intra-communication between RTLVDC and such IEDs to meet the requirement.

Hardware Integration Tests shall be performed on the specified systems to be used for Factory tests when the hardware has been installed in the factory. The operation of each item shall be verified as an integral partof system. Applicable hardware diagnostics shall be used to verify that each hardware component is completely operational and assembled into a configuration capable of supporting software integration and factory testing of the system. The equipment expansion capability shall also be verified during the hardware integration tests.

Integrated System Tests shall verify the stability of the hardware and the software. During the tests all functions shall run concurrently and all equipment shall operate a continuous 100 Hours period. The integrated system test shall ensure the IEDs is free of improper interactions between software and hardwarewhile the system is operating as a whole.

8.0 Type test Certificate

Test reports for following type tests shall be submitted for the Protection IED along with the Bid

		S. No.	Description	Standard
8.1	Insulation test	1	Dielectric Withstand Test	IEC 60255-5
				ANSI/IEEE C37.90-1989
				2kV rms for 1 minute between all case terminals connected together and the case earth
				2kV rms for 1 minute between all terminals of independent circuits with terminals on each independent circuit connected together.
				1KV rms for 1 min across the open contacts of the witchdog IED
				1KV rmsfor Minute across open contacts of the changeover output IEDs
				1.5KV rms for 1 minute across open contacts of normally open output IEDs
		2	High Voltage Impulse Test,class III	IEC 60255-5
				5kV peak; 1.2/50 sec; 0.5J; 3 positive and 3 negative shots at intervals of 5s

8.2	Electrical Environment Tests	1	DC Supply Interruption	IEC 60255-11
				The unit will withstand a 20ms interruption in the auxiliary supply, in its quiescent state, Without de-energizing.
		2	AC Ripple on DC supply	IEC 60255-11The unit will withstand a 12% ac ripple on the dc supply.
		3	AC voltage dips and short Interruptions	IEC 61000-4-11 20ms
				interruptions/dips.
		4	High Frequency Disturbance	IEC 60255 22 1, class III
				At 1MHz, for 2s with 200 ohms source impedance:2.5kV peak; 1 MHz; T = 15 sec; 400
				shots/sec;duration 2 sec between independent circuits and independent circuits and case earth. 1.0kV peak across terminals of the same circuit.
		5	Fast Transient Disturbance	IEC 60255-22-4, class IV
				4kV, 2.5kHz applied directly to auxiliary supply 4kV, 2.5kHz applied to all inputs.
		6	Surge Withstand Capability	IEEE/ANSI C37.90.1 (1989)
				4kV fast transient and 2.5kV oscillatory applied directly across each output contact, optically isolated input and power supply circuit.
		7	Radiated Immunity	C37.90.2: 1995
				25MHz to 1000MHz, zero and 100% square wave modulated. Field strength of 35V/m.
		8	Electrostatic Discharge	IEC 60255-22-2 Class 4
				15kV discharge in air to user interface, display and exposed metal work.
				IEC 60255-22-2 Class 3
				8kV discharge in air to all communication ports. 6kV point contact discharge to any part of the front of the product.
		9	Surge Immunity	IEC 61000-4-5: 1995 Level 4
				4kV peak, 1.2/50ms between all groups and case earth.
				2kV peak, 1.2/50ms between terminals of each group.
		10	Capacitor Discharge	No change of state or any operation shall occur when a capacitor of capacitance shown below, charged to 1.5 Vn volts, is connected between any combination of terminals and any combination of terminals and ground.
				Master trip circuits - 10 F Other protection & control circuits - 2 F
				Carrier/channel interface - 0,2 F
8.3	EMC Test	1	Radio- Frequency Electromagneti c	IEC 60255 22 2, class III

			Field, Non-Modulated	10 V/m; 27 MHz to 500 MHz
		2	Radio- Frequency Electromagnetic Field, Amplitude Modulated	ENV 50140, class III
				10 V/m; 80 MHz to 1000 MHz;
				80% AM; 1 kHz
		3	Radio- Frequency Electromagneti c Field, Pulse Modulated	ENV 50140/ENV 50204
				10 V/m; 900 MHz; repetition frequency 200 Hz; duty cycle 50 %
		4	Disturbances Induced by Radio Frequency fields,Amplitude Modulated	ENV 50141, class III
				30 A/m continuous; 300 A/m
				for 3 sec; 50 Hz
		5	Power Frequency Magnetic Field	EN 61000-4-8, class IV
				30 A/m continuous; 300 A/m
				for 3 sec; 50 Hz
		6	Interference Voltage, Aux.Voltage	EN 50081-*
				150 kHz to 30 MHz
		7	Interference Field Strength	EN 50081-*
				30 MHz to 1000 MHz
8.4	Atmospheric Environment Test	1	Temperature	IEC 60255-6
				Operating 25 ° C to +55 C
				Storage and transit 25 ° C to +70C
				IEC 60068-2-1 for Cold
				IEC 60068-2-2 for Dry heat
		2	Humidity	IEC 60068-2-3
				56 days at 93% RH and +40°C
8.5	Mechanical Stress Test	1	Vibration (during Operation & Transportation)	IEC 255-21-1; IEC 68-2-6
				Response Class 2
				Endurance Class 2
		2	Shock (during Operation and Transportation)	IEC 255-21-2, class 1, IEC 68-
				2-27 Shock response Class 2 Shock withstand Class 1 Bump Class 1
		3	Seismic Vibration (during Operation)	IEC 60255-21-3 Class 2
		4	Continuous Shock (during Transportation)	IEC 255-21-2, class 1, IEC 68-2-27
8.6	Ingress Protection	1	Type Test for IP66	

9. PRE DISPATCH INSPECTION

Equipment shall be subject to inspection by a duly authorized epresentative of the Purchaser as detailed at Clause No.6.0. Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection.

Bidder shall grant free access to the places of manufacture to Purchaser's representatives at all times when thework is in progress. Inspection by the Purchaser or its authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications Material shall be dispatched after specific MDCC (Material Dispatch Clearance

Certificate) is issued by the Purchaser.

Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
c) Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warranty card
g) Delivery Challan
h) Other Documents (as applicable)

10. INSPECTION AFTER RECEIPT AT STORES

Equipment/material received at shall be inspected by Stores liable for rejection, if founddifferent from pre despach inspection report

One copy of the Inspection Report shall be sent to the Plant Engineering and Protection & Testing Departments.

11.GUARANTEE

Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Company up to a period of 60 months from the date of commissioning supplier shall be liable to undertake to replace/rectify such defects at his own costs within the mutually agreed timeframe, and to the entire satisfaction of the Company, failing which the Company will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the supplier or from the "Security cum Performance Deposit" as the case may be.

Bidder shall further be responsible for 'free replacement' for another period of three years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Company

12.PACKING

Bidder shall ensure that all equipment covered by this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

13.TENDER SAMPLE : NA

14. TRAINING :
The successful Bidder shall provide training for relay configuration with goose messaging, data concentrator at supplier's works - 4 persons 3 days minimum to Owners Engineers before dispatch. Venue of the training shall be Bidders works or TPCODL/TPNODL/TPSODL/TPWODL Office and same shall be finalized by TPCODL/TPNODL/TPSODL/TPWODL at the time of project closure/completion of SAT. The training shall cover Engineering configuration of the IED. IED setting calculations, training However, lodging/boarding/transportation of trainees shall be borne by TPCODL/TPNODL/TPSODL/TPWODL.

Supplier per sonnel w ho are exp erienced instructor s and who speak understandable English shall conduct training. The Supplier shall arrange on its own cost all hardware training platform required for successful training and understanding in India at manufacturer' s work. The Supplier shall provide all necessary training material including configuration document in advance. Each trainee shall receive individual copies of all technical manuals and all other documents used for training. Class materials, including the documents sent before the training courses as well as class handouts, shall become the property of Employer. Employer reserves the right to copy such materials, but for in- house training and use only. Hands-on training shall utilize equipment identical to that being supplied to Employer. For all training courses, the travel (e.g., airfare) and per-diem expenses will borne by the participants. The schedule, location, and detailed contents of each course will be finalized during Employer and Supplier discussions.uploading/downloading, secondary injection testing on computerized IED testing kit, checking of DC logic etc. No extra charges shall be payablefor

15.QUALITY CONTROL
The bidder shall submit with the offer, quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and after finishing, bought out items and fully assembled component and equipment including drives. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The purchaser's engineer or its nominated representative shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16.MINIMUM TESTING FACILITIES
The Bidder shall have in house testing facilities for carrying outall routine tests and acceptance tests as per relevant international/Indian standards.

17.MANUFACTURING ACTIVITIES
The successful bidder will have to submit the bar chart for various Activities manufacturing activities clearly elaboratingeach stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. The bar chart will have to be submitted within 15 days from the release of the order

18.SPARES, ACCESSORIES AND TOOLS of the order.
Bidder need to furnish the expected life of IEDs While submitting the Accessories and performance reports of the concerned IEDs. Bidders need to provide life cycle Tool support and supplies to ensure Necessary support in terms ofservices an d spares for next 15 years regarding discontinuation OEM must need to follow clauses 3.15 & 6 of IEC 51850-4. The example cases should be taken as reference.

Vendor need to provide life cycle support and supplies to ensure necessary support in terms of services and spares fornext 15 years from date of Purchase Order. Vendor shall provide expected life of IEDs in writing.

Vendor shall conform to the following guideline to mitigate failure, To provide immediate support in case of failure of IED. The vendor shall always maintain 2 Nos. of IEDs as spare at their India office/ TPCODL/TPNODL/TPSODL/TPWODL Office.

- Vendor shall report to site within 48 hours of receipt of reporting of the failure occurrence.
- Vendor shall provide replacement of the faulty IEDs within 7 days after confirmation of the fact that the IEDcan' t be repaired at site.
- Vendor shall provide detailed root cause analysis report of thefaulty IEDs within 30 days from the date of the IED receipt.
- Any spare IED replacement, testing and its commissioning to be done by vendor only without any cost implications. Any equipment, any software or any hardware to test the IEDs to be borne by vendor only.
- Any up gradation in application software and IED (except hardware) will be informed to us and necessary upgradation to be carried out by vendor without any cost implications.

Spares for Project job for New Grids/Bay Extension

Same MLFB No/ Order Code across 11kV Board including PU. BCPU MLFB No / Order Code shall remain same across 33kV/66kV Board.				
Relays for 11kV panels				
Total No. of (main & backup) relays in Panel board to be supplied	No. of Spare relays			
1-10	1			
11-20	2			
21-30	3			
31-40	4			
33kV/66kV panel				
No. of Panels	No. of Spare Relays			
	BCPU	Line PU	Transformer PU	
2 Line, 2 Trafo, 1 B/C	1	1	1	1
4 Line, 2 Trafo, 1 B/C	1	1	1	1
4 Line, 3 Trafo, 1 B/C	2	1	1	1
6 Line, 3 Trafo, 1 B/C	2	1	1	1
1 line, 1 Trafo, 1 B/C	1	1	1	1
2 line, 1 Trafo, 1 B/C	1	1	1	1

Master Trip Relay (86) common for 66kV/33kV and 11kV	
No. of relays in Panels	No. of Spare relays
1-10	1
11-20	2
21-30	3
31-40	4

Services to be included during tender

i. Tri- party agreement to be made to have protection against quitting of executing vendor.

ii. In case total failure of IEDs during the warranty period exceeds 20% of the installed quantity of respective type at a particular station then vendor to configure these as some latent defect and

configure replacement of all IEDs in TPCODL/TPNODL/TPSODL/TPWODL
i, Preferably All the IEDs shall any external environmental its scope without any cost implication to have conformal coating to take care of polluting effect etc. TPCODL/TPNODL/TPSODL/TPWODL shall not be responsible if any such reason causes failure of cards/IEDs and each shall be vendor's responsibility to replace IED without any cost implication to TPCODL/TPNODL/TPSODL/TPWODL

19.DRAWINGS AND DOCUMENTS

Following drawings and documents shall be prepared on Purchaser's specifications and statutory requirements and shall be submitted with the bid:

- Completely filled in Technical Particulars
- General description of the equipment and all components including brochures
- Bill of material
- Type test certificates
- Hardware Specification
- Sizing Calculations of various component
- Standard Drawings
- ICD/CID Cite (IED capability description file)
- SCD file (substation configuration description)
- MIB Files of IEDS

After the award of the contract four (4) copies of drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which
shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.

All the documents & drawings shall be in English language.

Instruction Manuals Bidder shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals (in English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

20. SAMPLE DRAWING
Not applicable

21. GUARANTEED TECHNICAL PARTICULARS
Bidder shall submit separate sheet showing compliances on all other clauses of the specification

22. SCHEDULE OF DEVIATIONS

(TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

We confirm that there are no deviations apart from those detailed above.

S. No	Clause No.	Details of deviation with justifications

Seal of the Company: Signature Designation