Procedure to Participate in CCG (Centralized Contracts Group) Tender

Tender Enquiry No	Work Description	EMD (Rs.) *	Tender Participation Fee inclusive of GST (Rs.) **	Last Date and Time for payment of Tender Participation Fee
TPCODL / CCG / 23-24 / 006	1 Year Rate Contract for Supply of 33 KV & 11 KV Metering Units & Metering Cubicles, at TPNODL & TPWODL.	Lot-I = Rs. 2 lakhs Lot-II = Rs. 5 lakhs Lot-III = Rs. 2 lakhs Lot-IV = Rs. 5 lakhs	5,000	05.07.2023, 15:00 Hrs.

* EMD is exempted for MSMEs registered in the State of Odisha.
** MSMEs registered in the State of Odisha shall pay the tender fee of Rs. 1,000/- including GST.
For details of MSME norms, please refer "Annexure-VII(a)"

Please note that the corresponding details mentioned in this document will supersede any other details mentioned anywhere else in the Tender Document.

Procedure to Participate in Tender.
Following steps to be done before the “Last date and time for Payment of Tender Participation Fee” as mentioned above

1. Eligible and Interested Bidders are to submit duly signed and stamped letters on Bidder's letterhead indicating
    a. Tender Enquiry number
    b. Name of authorized person
    c. Contact number
    d. e-mail id
    e. Name of Firm
    f. Address of Firm
    g. GST Registration Number
    h. Details of submission of Tender Participation Fee
    i. MSME Certificate, wherever applicable
    j. Details of Bank Account for a refund of EMD
    k. Postal Address for a refund of EMD
    l. Ariba ANID (if any)

2. Non-Refundable Tender Participation Fee, as indicated in the table above, to be submitted in the form of Direct deposit in the following bank account and submit the receipt along with a covering letter clearly indicating the Tender Reference/ Enquiry Number –
    Beneficiary Name – TP Central Odisha Distribution Ltd.
    Bank Name – STATE BANK OF INDIA
    Branch Name – IDCO Towers, Bhubaneshwar
    Address – PO- Sahidnagar, Janapath, Bhubaneswar.
    Branch Code – 7891
    Account No – 10835304915 IFSC Code – SBIN0007891

3. **Estimated Quantity:**

Sl. No.	Lot no.	ITEM DESCRIPTION	Unit	TPNODL Qty.	TPWODL Qty.	TOTAL QTY.
1	I	33KV METERING UNIT 10/5A B/B ACCU 0.2S	EA	40	15	**55**
2	I	33KV METERING UNIT 15/5A B/B ACCU 0.2S	EA	30	15	**45**
3	I	33KV METERING UNIT 20/5A B/B ACCU 0.2S	EA	20	15	**35**
4	I	33KV METERING UNIT 30/5A B/B ACCU 0.2S	EA	15	15	**30**
5	I	33KV METERING UNIT 50/5A B/B ACCU 0.2S	EA	-	10	**10**
6	I	33KV METERING UNIT 100/5A B/B ACCU 0.2S	EA	-	20	**20**
7	I	33KV METERING UNIT 200/5A B/B ACCU 0.2S	EA	-	25	**25**
8	I	33KV METERING UNIT 800/5A B/B ACCU 0.2S	EA	-	5	**5**
9	II	11KV METERING UNIT 5/5A B/B ACCU 0.5S	EA	150	40	**190**
10	II	11KV METERING UNIT 10/5A B/B ACCU 0.5S	EA	200	200	**400**
11	II	11KV METERING UNIT 15/5A B/B ACCU 0.5S	EA	150	70	**220**
12	II	METERING UNIT 11KV 3P4W 20/5 AMP	EA	100	70	**170**
13	II	METERING UNIT 11KV 3P4W 50/5 AMP	EA	-	10	**10**
14	II	METERING UNIT 11KV 3P4W 100/5 AMP	EA	-	10	**10**
15	II	METERING UNIT 11KV 3P4W 200/5 AMP	EA	-	10	**10**
16	III	METERING CUBICLE 33KV 5/5A	EA	-	10	**10**
17	III	METERING CUBICLE 33KV 10/5A	EA	40	30	**70**
18	III	METERING CUBICLE 33KV 15/5A	EA	30	30	**60**
19	III	METERING CUBICLE 33KV 20/5A	EA	20	30	**50**
20	III	METERING CUBICLE 33KV 25/5A	EA	20	10	**30**
21	III	METERING CUBICLE 33KV CTR 30/5A	EA	15	20	**35**
22	IV	METERING CUBICLE 11KV 5/5 A	EA	-	70	**70**
23	IV	METERING CUBICLE 11KV 10/5 A	EA	150	200	**350**
24	IV	METERING CUBICLE 11KV 15/5 A	EA	100	100	**200**
25	IV	METERING CUBICLE 11KV 20/5A	EA	55	80	**135**
26	IV	METERING CUBICLE 11KV CT RATIO 30/5 A	EA	30	50	**80**
27	IV	METERING CUBICLE 11KV 50/5 A	EA	10	10	**20**

Note:

Above Quantities are tentative. Tata Power reserves the right to curtail / enhance the quantities before the placement of the Release Order.

The tender is being floated by CCG for catering to the consolidated requirement of TP Odisha Discoms TPNODL & TPWODL.

Delivery Terms:

Release Orders shall be issued by respective TP Odisha Discom as per the requirement. The successful bidder shall deliver the material as per the location mentioned in the RO.

Delivery period shall be 90 days from the date of receipt of Release Order / CAT-A issuance, whichever is later.

BA shall submit GTP/ Drawing within 10 days from issuance of rate contract. In case BA does not get necessary approvals for issuance of manufacturing clearances /CAT-A within mentioned /mutually agreed timelines, then TPCODL/other TP Odisha Discoms reserve the right to cancel issued rate contract / release order and also reserve the right to forfeit EMD/PBG.

Payment Terms

On delivery of the materials in good condition and certification of acceptance by a certified official, the Associate shall submit the Bills/ Invoices in original in the name as mentioned in the release order and submit to the respective Invoice Desk. The payment shall be released within 60 Days (Non- MSME) / 45 days (MSME) from the date of submission of certified error-free bills/ invoices.

An E-mail with the necessary attachment of 1 and 2 above is to be sent to santanu.mukherjee@tpnodl.com with a copy to Vipin.chauhan@tpnodl.com before the last date and time for payment the of Tender Participation Fee.

Interested bidders to submit Tender Participation Fee and Authorization Letter before the Last date and time as indicated above after which a link from the TPCODL E-Tender system (Ariba) will be shared for further communication and bid submission.

Please note all future correspondence regarding the tender, bid submission, bid submission date extension, Pre-bid query, etc. will happen only through the TPCODL E-Tender system (Ariba). A user manual to guide the bidders to submit the bid through the E-Tender system (Ariba) is also enclosed.

All communication will be done strictly with the bidders who have done the above step to participate in the Tender.

Also, it may be strictly noted that once the date of “Last date and time for Payment of Tender Participation Fee” is lapsed no Bidder will be sent a link from TPCODL E-Tender System (Ariba). Without this link, the vendor will not be able to participate in the tender. Any last moment request to participate in the tender will not be entertained.

Also, all future corrigendum to the said tender will be informed on the Tender section on the website https://www.tpcentralodisha.com

OPEN TENDER NOTIFICATION
FOR
RATE CONTRACT FOR SUPPLY OF 33 KV & 11 KV METERING UNITS & METERING CUBICLES, AT TPNODL & TPWODL.

Tender Enquiry No.: TPCODL / CCG / 23-24 / 006

Due Date for Bid Submission: 10.07.2023 [up to 15:00 Hrs.]

The TP Central Odisha Distribution Limited
2nd Floor, IDCO Towers, Janpath, Bhubaneswar-751022

CONTENTS OF THE ENQUIRY

1.0 Event Information

1.1 Scope of work

An Open Tender is invited through e-tender bidding process from interested Bidders for entering into a Rate Contract for a period of **ONE (01)** Year as defined below:

Item Sl. No.	Description	Quantity	EMD Amount (Rs.) *	Tender Fee inclusive of GST (Rs.) **
1	Supply of 33KV & 11KV Metering Units & Metering Cubicles, at TPNODL & TPWODL	4 lots	Lot-I = Rs. 2 lakhs Lot-II = Rs. 5 lakhs Lot-III = Rs. 2 lakhs Lot-IV = Rs. 5 lakhs	5,000

* EMD is exempted for MSMEs registered in the State of Odisha.

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

1.2 Availability of Tender Documents

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

1.3 Calendar of Events

(a)	Date of sale/ availability of tender documents from TPCODL Website	From 22.06.2023 onwards
(b)	Date by which Interested and Eligible Bidder to pay Tender Fee and confirm participation as mentioned in "Procedure to Participate in Tender"	05.07.2023, 15:00 Hrs.
(c)	Date & Time of Pre-Bid Meeting (If any)	NA
(d)	Last Date and time of receipt of pre-bid queries, if any	29.06.2023 up to 15:00 Hours
(e)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	04.07.2023
(f)	Last date and time of receipt of Bids	10.07.2023 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

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

1. The Average Annual Turnover of the prospective bidder(s) should be equal to or more than Rs. 02 Crores during any three of last five Financial years (i.e FY 18-19 ,FY 19-20, FY 20-21, FY 21-22 & FY 22-23). For MSME registered in the State of Odisha, criteria shall be reduced to 20% of the existing one. Copy of audited P&L Account (with UDIN no.) to be submitted in this regard.

2. The bidder should have own manufacturing facility to manufacture the tendered materials of same or higher rating and should have in-house facilities for routine & acceptance tests as per technical specifications. Bidder must submit undertaking in this regard.

3. The bidder should have executed either 25% of the total lot-wise tender quantity during last five years; or single order of 15% of the total lot-wise tender quantity during last three years; or 2 orders of 10% each of the total lot-wise tender quantity during last 5 years.

Copy of work order / completion certificate to be submitted in this regard.

4. Certificate for satisfactory performance issued by other Discoms/ PSUs / Reputed companies is to be submitted. The work against these issued certificates should be completed in last 07 years from the date of bid submission.

In case the bidder has a previous association with Tata Power Discoms for similar products and services, the performance feedback for that bidder by Tata Power's User Group shall only be considered irrespective of performance certificates issued by any third organization.

5. The bidder must adhere to all statutory compliances like valid PAN no, and GST No. 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 behavior 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 compliance with tender terms and conditions.
- The bids will be evaluated commercially on ***the Lot-wise overall lowest cost basis*** as calculated in the Schedule of Items *[Annexure I]*.TPCODL reserves the right to split the order line tem-wise and/or quantity-wise, among more than one Bidder. Hence all bidders are advised to quote their most competitive rates.
- 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, factory inspection and evaluation shall be carried out to ascertain bidder's manufacturing capability and quality procedures. However, TPCODL reserves the right to carry out factory inspection and evaluation for any bidder prior to technical qualification. In case a bidder is found as Disqualified in the factory 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 e-mail or 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 for the LOT(s) 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 Bank Details for transferring Tender Fee and EMD is as below:

Beneficiary Name – TP Central Odisha Distribution Ltd.
Bank Name – STATE BANK OF INDIA
Branch Name – SBI, IDCO Towers, Bhubaneshwar
Address – PO- Sahidnagar, Janapath, Bhubaneswar.
Branch Code – 7891
Account No – 10835304915
IFSC Code – SBIN0007891

EMD is strictly preferred in the 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 (Centralised Contracts Group, TP Odisha Discoms)

TP CENTRAL ODISHA DISTRIBUTION LIMITED

2ND FLOOR, IDCO TOWERS, JANAPATH, BHUBANESWAR- 751022.

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 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 required**.

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 e-mail or 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:

Package Owner

Name: Mr. Santanu Mukherjee
Designation: Lead Engineer - CCG
Contact No: 6297445379
E-Mail ID: santanu.mukherjee@tpnodl.com

Escalation Matrix

Name: Mr. Vipin Chauhan
Designation: Head- Contracts, CCG
Contact No: 9717393121
E-Mail ID: Vipin.Chauhan@tpnodl.com

Name: Mr. Pradip Sil
Designation: Chief- Centralised Contracts Group
E-Mail ID: pradip.sil@tpnodl.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.

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 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 favor of "TP Central Odisha Distribution Limited", 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 internally by TPCODL. Participating Bidders will 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/or 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 Technically, Commercially and /or safety qualified Bidders shall be considered and opened internally by TPCODL. Bidders will get mail intimation from the 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 reserves the right to conduct the reverse auction (instead of public opening of price bids) for the products/ services being asked for in the 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.

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 the bidder in Annexure I (Schedule of Items) subject to any corrections required in line with Clause 4.3 above. The decision to place a rate contract/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 canceled 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 the 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

- Rate Contract shall be valid for a period of 12 months from the placement of the Contract. Release Order (RO) shall be placed as per the requirement of respective TP Odisha Discom. Rates shall remain firm throughout RC period.
- Prices shall be inclusive of Transit Insurance/ Packing & Forwarding charges and shall be inclusive of unloading and stacking at TPNODL & TPWODL site/store locations.
- Exact delivery location shall be mentioned in Release Order.
- BA shall submit applicable PBG as per GCC within 21 days of issuance of RC. PBG applicable shall be 5% of contract value. PBG submitted, shall be released after completion of applicable guarantee period plus one month. Performance Bank Guarantee for MSME registered in the State of Odisha shall be 25% of the value normally prescribed.
- Guarantee period shall be 60 months from date of supply.
- BA shall submit GTP/ Drawing within 10 days from issuance of rate contract. In case BA does not get necessary approvals for issuance of manufacturing clearances /CAT-A within mentioned /mutually agreed timelines, then TPCODL/other TP Odisha Discoms reserve the right to cancel issued rate contract / release order and also reserve the right to forfeit EMD/PBG.
- Delivery Period shall be 90 days from date of receipt of release order / CAT-A issuance, whichever is later.
- Payment Terms: 100% payment within 60 days of submission of certified error-free Invoice complete in all respects. However, for MSME the payment cycle shall be 45 days.
- Prices shall remain firm throughout the RC period.
- Pre-dispatch inspection, MDCC and LD shall be applicable as per GCC.
- TPCODL / Other TP Odisha Discoms shall short close the issued Release Order / Rate contract, in case of any quality issues.
- Any change in statutory taxes, duties and levies during the contract period shall be borne by respective TP Odisha Discom. However, in case of delay in supply owing to reasons not attributable to TP Odisha Discom, any increase in total liability shall be passed on the Bidder, whereas any benefits arising owing to such statutory variation in taxes and duties shall be passed on TP Odisha Discom.
- All other terms of TPCODL GCC – Supply shall be applicable.

7.2 Drawing Submission & Approval

The relevant drawings and GTPs need to be submitted as per the special condition of the contract mentioned in point no. 7.1.

7.3 Delivery Terms

The delivery of material shall be made as per the special condition of the contract mentioned in point 7.1.

7.4 Guarantee Period

The guarantee period of material shall be made as per the special condition of the contract mentioned in point 7.1.

7.5 Payment Terms

The payment terms shall be made as per the special condition of the contract mentioned in point 7.1.

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 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 tender.

9.0 General Condition of Contract

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

10.0 Safety

Safety-related requirements as mentioned in our safety Manual are put on the Company's website and the same shall be strictly followed.

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.	Lot no.	Item Description	UoM	Quantity	Unit Price (Rs/unit)	GST (Rs/unit)	All-inclusive Unit Price (Rs/unit)	Total All-inclusive Amount (Rs.)
				A	B	C	D=B+C	E=DxA
1	LOT-I	33KV METERING UNIT 10/5A B/B ACCU 0.2S	EA	55				
2		33KV METERING UNIT 15/5A B/B ACCU 0.2S	EA	45				
3		33KV METERING UNIT 20/5A B/B ACCU 0.2S	EA	35				
4		33KV METERING UNIT 30/5A B/B ACCU 0.2S	EA	30				
5		33KV METERING UNIT 50/5A B/B ACCU 0.2S	EA	10				
6		33KV METERING UNIT 100/5A B/B ACCU 0.2S	EA	20				
7		33KV METERING UNIT 200/5A B/B ACCU 0.2S	EA	25				
8		33KV METERING UNIT 800/5A B/B ACCU 0.2S	EA	5				
9	LOT-II	11KV METERING UNIT 5/5A B/B ACCU 0.5S	EA	190				
10		11KV METERING UNIT 10/5A B/B ACCU 0.5S	EA	400				
11		11KV METERING UNIT 15/5A B/B ACCU 0.5S	EA	220				
12		METERING UNIT 11KV 3P4W 20/5 AMP	EA	170				
13		METERING UNIT 11KV 3P4W 50/5 AMP	EA	10				
14		METERING UNIT 11KV 3P4W 100/5 AMP	EA	10				
15		METERING UNIT 11KV 3P4W 200/5 AMP	EA	10				
16	LOT-III	METERING CUBICLE 33KV 5/5A	EA	10				
17		METERING CUBICLE 33KV 10/5A	EA	70				
18		METERING CUBICLE 33KV 15/5A	EA	60				
19		METERING CUBICLE 33KV 20/5A	EA	50				
20		METERING CUBICLE 33KV 25/5A	EA	30				
21		METERING CUBICLE 33KV CTR 30/5A	EA	35				
22	LOT-IV	METERING CUBICLE 11KV 5/5 A	EA	70				
23		METERING CUBICLE 11KV 10/5 A	EA	350				
24		METERING CUBICLE 11KV 15/5 A	EA	200				
25		METERING CUBICLE 11KV 20/5A	EA	135				
26		METERING CUBICLE 11KV CT RATIO 30/5 A	EA	80				
27		METERING CUBICLE 11KV 50/5 A	EA	20				
							ALL INCLUSIVE AMOUNT FOR TOTAL BOQ (Rs.)	

NOTE:

- Prices shall be firm till the validity of the contract.
- The bids will be evaluated commercially on the Lot-wise overall lowest cost basis.
- The unit price to be entered in in column "B" of above table is exclusive of GST.
- The prices mentioned above shall be on FOR basis for all the TPNODL & TPWODL locations.
- The total requirement mentioned above is for TPNODL & TPWODL.
- Issuance of Release Orders (RO) shall be done by respective discoms as per their requirement.
- The material shall be delivered as per the location captured in the release order.
- 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.
- The quantity mentioned above are for evaluation purpose only and may vary as per actual site requirement.

Signature & Seal of the Bidder

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 (180 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.)

Signature & Seal of the Bidder

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/ organogram	
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	

Signature & Seal of the Bidder

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 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 the availability of the entire infrastructure as required at their end to participate in the auction event. Inability to bid due to telephone line glitches, internet response issues, software or hardware hangs, power failure or any other reason shall not be the responsibility of TPCODL.
6. In the 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 to 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 the TPCODL site.
10. The prices submitted by a bidder during the auction event shall be binding on the bidder.
11. No requests for a time extension of the auction event shall be considered by TPCODL.
12. The original price bids of the bidders shall be reduced on a 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)

Annexure VII (a)

Preferential Norms for Procurement from MSMEs Registered in the State of Odisha

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.

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)

Annexure IX

Tata Code of Conduct (TCoC)
(attached separately)

Annexure X

Environment & Sustainability (attached separately)

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1038

Specification Name : 33 KV, 3P4W,(10A-800A)/5A,0.2s Accuracy class ,15VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
26-02-2023	27-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1038 **Specification Name:** 33 KV, 3P4W,10A-800A/5A,0.2s Accuracy class ,15VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

CONTENTS

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 33 KV, of different ratios, 3P4W, 0.2s & 0.2 accuracy class, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633
- Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum

12	Average Dust storms prevailing in the area	150 days per annum

TPCODL/TPNODL/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL PARTICULAR REQUIREMENT:

4.1 Metering Unit Rating:-

The 33 KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	33 KV
ii	Highest system voltage	36 KV
iii	Insulation level	70 KV RMS
iv	Standard Impulse withstand voltage	170 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	70 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	25KA for 1sec.
vii	Class of Accuracy	0.2s for CT & 0.2 for PT.
viii	Rated burden per Phase	For CTs : 15 VA (10-800A/5A)
		For PTs : 50 VA (33KV/√3/110/√3)
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	430 mm
xii	Shortest distance between the metal part & earth	380 mm
xiii	Creepage distance of HV bushing	900mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side
xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized

xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 120 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 33KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.
c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 Nitrogen gas filling shall be done to prevent absorption of moisture in the field for longer life of MU

5.1.3 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.4 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.5 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.6 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.7 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.8 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.9 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.10 The CTPT set should have Three CTs and one 3-phase PT with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided. This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length, 2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 **Mounting Arrangement:**

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 **Oil:**

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 **Guaranteed Technical Particulars:**

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6. NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL..

7. Tests:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL etc accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**
  1. Verification of terminal marking and polarity
  2. Temperature rise test.
  3. Lightning Impulse test
  4. High voltage Power frequency wet withstand voltage test.

5. Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

8. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerances:

Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection:

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a **random sample of 20 nos or 20% of the offered quantity** which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals

number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any "latent defect" if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos
6	HV bushings Outdoor	6 Nos

7	Secondary terminals bushings	As per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GURANTEED TECHNICAL PARTICULARS

For Supply of 33 KV, 3P4W, 0.2s accuracy class, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	33 KV	
5	Highest System Voltage	36 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.2s	
iii	Rated output	15 VA	
iv	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
v	Short time thermal current rating for 1 sec	25KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	33KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.2	
v	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		

III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	
V	Edge bending	To be provided in the Top Cover	

VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	900mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		
I	Primary terminals		

i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	430mm	
Ii	Shortest distance between metal part & earth	380 mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	
11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
12	Name Plate	As per tender requirement.	
13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
14	**Fittings**	As per tender clause 23.0	
15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
16	**Equi potential link**	02 nos of diagonally Cupper Strip i.e equ potential link to be provided between top cover and bottom cover of the MU.	

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 33KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	
4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	

11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	30x10^{12} ohms- cm. 500x10^{12} ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5 x 10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50 x 10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	51 pm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1038 **Specification Name:** 33 KV, 3P4W,10A-800A/5A,0.2s Accuracy class ,15VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1039

Specification Name : 33KV (10-800A)-1A,0.2s,15VA CT &0.2 class,50VA PT OIL COOLED METERING UNIT

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
26-02-2023	27-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1039 **Specification Name:** 33 KV, 3P4W,10A-800A/1A,0.2s Accuracy class ,15VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

CONTENTS

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 33 KV, of different ratios, 3P4W, 0.2s accuracy class for CT & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633
- Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum

12	Average Dust storms prevailing in the area	150 days per annum

TPNODL/TPSODL/TPCODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL PARTICULAR REQUIREMENT:

4.1 Metering Unit Rating:-

The 33 KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	33 KV
ii	Highest system voltage	36 KV
iii	Insulation level	70 KV RMS
iv	Standard Impulse withstand voltage	170 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	70 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	25KA for 1sec.
vii	Class of Accuracy	0.2s for CT & 0.2 for PT.
viii	Rated burden per Phase	For CTs : 15 VA (10 – 800A/1A)
		For PTs : 50 VA (33 kv /√3/ 110/√3)
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	430 mm
xii	Shortest distance between metal part & earth	380 mm
	Type of bushing	Porcelain
xiii	Creepage distance of HV bushing	900mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side

xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized
xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 120 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 33KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.

c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 Nitrogen gas filling shall be done to prevent absorption of moisture in the field for longer life of MU.

5.1.3 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.4 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.5 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.6 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.7 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.8 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.9 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.10 The CTPT set should have Three CTs and one 3-phase PTs with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided**.** This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length,

2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 **Mounting Arrangement:**

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 **Oil:**

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 **Guaranteed Technical Particulars:**

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6. NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL..

7. Tests:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**
  1. Verification of terminal marking and polarity
  2. Temperature rise test.

3. Lightning Impulse test
4. High voltage Power frequency wet withstand voltage test.
5. Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

8. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerances:

Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection:

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a **random sample of 20 nos or 20% of the offered quantity** which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any "latent defect" if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos

6	HV bushings Outdoor	6 Nos
7	Secondary terminals bushings	As per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GURANTEED TECHNICAL PARTICULARS

For Supply of 33KV, 3P4W, 0.2s accuracy class for Ct & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	33 KV	
5	Highest System Voltage	36 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.2s	
iii	Rated output	15 VA	
iv	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
v	Short time thermal current rating for 1 sec	25KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	33KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.2	
v	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		

i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	

V	Edge bending	To be provided in the Top Cover	
VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	900mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		

I	Primary terminals		
i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	430mm	
Ii	Shortest distance between metal part & earth	380 mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	
11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
12	Name Plate	As per tender requirement.	
13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
14	**Fittings**	As per tender clause 23.0	
15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
16	**Equi potential link**	02 nos of diagonally Cupper Strip i.e equ potential link to be provided	

			between top cover and bottom cover of the MU.		

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 33KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	
4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	

11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	30x10^{12} ohms- cm. 500x10^{12} ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5 x 10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50 x 10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	51 pm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1039 **Specification Name:** 33 KV, 3P4W,10A-800A/1A,0.2s Accuracy class ,15VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1040

Specification Name : 33KV (5-400/5A,0.2s CLASS, 15VA CT and 0.2 class, 50VA PT) METERING CUBICLE

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
15-02-2023	17-02-2023	17-02-2023	22-02-2023	22-02-2023	22-02-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV- 1040 **Specification Name:** **TECHNICAL SPECIFICATION FOR 33KV (5-400/5A) (0.2s CLASS)15VA CT & (0.2 CLASS) 50VA PT METERING CUBICLE**

CONTENTS

1. SCOPE:

The specification covers the design, manufacture, testing and supply of 33KV Indoor Type Metering cubicle & resin cast CT & PT for metering cubicle made of MS plate (Galvanized).

- The metering Cubicle shall be totally enclosed, air insulated dust and vermin proof having two separate compartments HT (lower) & LT (upper) provided with two separate doors, hinged inside the box. The33KV metering cubicle shall comply with the requirements of Indian Electricity Rule 1956 & as per relevant IS.

- The metering cubicle shall be supplied with 3nos. of 33KV single phase epoxy resin cast CT's & 3nos. of 33KV epoxy resin cast PT's and suitable clamping arrangement for holding 33KV incoming and outgoing cables and holding CTs & PTs.

- All the equipment shall comply with the requirement of relevant IS specification.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633 Primary Terminals : IS 10601

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	300 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)

TPNODL/TPSODL/TPCODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENT:

CURRENT TRANSFORMERS:

There shall be three number single core single ratio dry type epoxy resin cast, current transformers conforming to IS: 2705/ 1992 of latest revision thereof as per details mentioned below:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	33
2	Highest system voltage (kV r.m.s)	36
3	Frequency	50HZ
4	Number of CT	3Nos
5	Rated out put (VA burden)	15VA.
6	Rated continuous thermal current	1.2 times of rated primary current
7	Short time current rating for 1 sec.	6.4KA upto 20/5A for 1sec 13.1KA upto 100/5A for 1Sec 18.4KA above 100/5A for 1sec
8	Rated dynamic current (Peak)	2.5 times of short time thermal current rating
9	Instrument security factor	<5
10	Impulse withstand voltage (KVpeak) (on assembled CT-PT set)	170 KVpeak
11	. Maximum temperature rise ove maximum ambient temperature of 450C at rated continuous thermal current at rated frequency and with rated burden.	As per IS: 2705/ 1992 (Part-II)
12	Short time thermal current rating	6.4 kA for 3 seconds
13	Type of Insulation	E
14	Max. ratio error	Within limited of IS:2705 with latest amendment/revision
15	Max. phase angle error	Within limited of IS:2705 with latest amendment/revision

16	Rated voltage factor & time	1.2 times continuous and 1.5 times for 1 min
17	System condition	Effectively earthed system
18	Thickness of base plate	5mm
19	Type	Dry type epoxy resin cast
20	Creepage distance	900mm
21	Transformation ratio/ CT ratio	As per above schedule of requirement.
22	No. of cores	1 Nos
23	Rated continuous thermal current temperature rise over ambient	As per IS:2705/ 1992
24	One minute power frequency voltage withstand test on secondary winding	3KV
25	Class of accuracy	0.2s
26	Secondary termination	S1 & S2 shall be clearly marked
27	CT primary current	5-400 A
28	CT secondary current	5A
29	Total weight of the core before casting of Resin	To be provided by Bidder
30	Total weight of the unit after casting of Resin	To be provided by Bidder
31	Power frequency dry withstand test on primary winding	70 KV RMS

Short Circuit Rating of 33 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

N.B.- The dimension of the CT base plate should be **360mm** length form hole to hole and **170mm** width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

POTENTIAL TRANSFORMERS:

Details specification as per IS: 3156/ 1992 with latest amendments.

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	33
2	Highest system voltage (kV r.m.s)	36
3	Frequency	50HZ
	Number of phases	Single phase
4	No of PT	3 Nos
5	Rated Output (VA) Burden	50VA

6	Transformation ratio (PT ratio)	33KV/√3/ 110V/√3
7	Impulse withstand voltage (KVpeak) (on assembled CT PT set)	170
a.	One minute power frequency dry withstand voltage (on assembled CT-PT set Primary (KVrms) Secondary (KVrms)	70
b.	Class of accuracy	0.2
8	Rated voltage factor and time	1.2 times continuous and 1.5 times for 30 sec
9	System condition	Effectively earthed system
10	Maximum temperature raise over maximum ambient temperature(which may be takenas450C) at rated frequency and with rated Burden	Within limited of IS: 3156 with latest amendment/ revision.
11	Maximum ratio error	Within limited of IS: 3156 with latest amendment/ revision.
12	Maximum phase angle error	Within limited of IS: 3156 with latest amendment/ revision.
17	Type of Insulation	E
18	Creepage distance	900mm
19	Basic insulation Level	36/70/170 KV

N.B.- The dimension of the PT base plate should be **280mm** length form hole to hole and **250mm** width from hole to hole (the hole is slotted). The base plate should have open slot arrangement for adjustable fixing.

5. General Construction:

The 33KV metering cubicle panel shall be fabricated with MS sheet (Galvanized) having thickness not less than 3 mm. The overall dimensions of the cubicle shall be 1800mm (Height) X 1400mm (Length) X 1600mm (Depth). Total height including base channel will be 1900mm. Height of panel is fixed. Dimension of width & depth may be increased suitably to accommodate CTs/PTs, if required. These dimensions may vary slightly as per design of manufacturer taking into care the minimum clearance of 320mm between phases as well as between phase and earth.

- All the edges and joints shall be made and welded in such a way that no access inside the cubicle shall be possible and shall thus provide strength to robust mechanical structure both during transportation and installation.

- The metering cubicle shall be totally enclosed and shall be provided with two nos. hinged door made of MS sheet (Galvanized) which shall rest on the collar along the four sides of cubicle so that the door remain flushed with body of the cubicle.

- The hinge of the doors shall be concealed type (proper welded from inside) so as to eliminate any chance of de-hinging without without causing any damage to the cubicle.

- The Metering cubicle shall be provided with MS channels support of 100mm x 50mm 5mm welded at bottom along it's length 1400mm.

- Each of the supporting channel shall have two holes of 12mm of dia. suitable for foundation bolts.

- The Metering cubicle shall be provided with MS Earthing strip of size 50mm x 5mm welded at the two opposite base angles provided with welded nut of 6mm dia. welded from inside the cubicle. The earthing strip can be connected by tightening a bolt from outside the metering cubicle at two opposite ends.

- The metering panel shall be cleaned suitably and will go through phosphating using seven tank dipping procedure and its surface shall be made smooth. It shall be Galvanized as per relevant IS specification.Mass of Zinc shall be 460 g/m² as per IS 4759: 1996. Height of panel is fixed but width & depth is minimum and may be increased suitably to accommodate CTs/PTs, if required. Thus, total height including base channel will be 1900mm. The panel should be provided with 4nos. lifting hooks.

- The metering cubicle shall have two separate compartments separated by MS sheet of 2.0mm thickness as given below.

- Two 60 W space heater with thermostat must be kept on both corner side of the cubicle chamber with operating switch must kept outside.

UPPER (LT) COMPARTMENT:

- The upper compartment of the metering cubicle shall be called LT compartment and shall have approximate height of 550mm. The compartment shall have provision for housing a tri-vector meter along with its associated wiring. The upper compartment will be double door type and the arrangement for meter fixing will be in inner portion.
- For fixing of KWH tri-vector meter in this compartment, four nos. MS slotted angles of suitable size shall be welded to the body from inside of partition chamber in LT compartment, two nos. slotted angles shall be bolted vertically and two nos.

horizontally, which shall be movable forming to adjust the distance and height of meter to be fixed in the compartment.

- The upper compartment shall be provided with one door fabricated in one piece and hinged as per clause no.-2.3. The door shall be provided with synthetic/semi synthetic gasket to make it dust & vermin proof. The door shall be provided with a handle and two nos. sealing arrangement. There shall be fixed (non-openable) window (approximate size 300mm x 200mm) fitted with transparent acrylic glass. The glass shall be fitted/ tightened with MS frame from inside of window. The height of the window shall be such that the reading can be taken easily from outside).

The LT compartment shall essentially contain the following:

- Hanger of slotted angle for mounting main meter (L&T, SECURE, PAL MOHAN, GENUS, VISIONTEK make etc.) for having flexibility for mounting of meter vertically and horizontally (meter not in scope of this tender supply).

LOWER (HT) COMPARTMENT:

- The lower compartment of metering cubicle shall be called HT compartment and shall have approximate height of 1250mm.
- This compartment shall be housed three nos. 33KV single phase epoxy resin cast CT's for 'R', 'Y' and B' phase and three nos. 33KV single-phase epoxy resin cast PT's, connecting strip between CT's and PT's, bus bar with suitable clamping arrangement for incoming and outgoing 33KV XLPE cables. There shall be two nos. sealing arrangement diagonally in base of each CT & PT.
- The door of lower compartment shall be provided with one door fabricated in one pieces and hinged as per clause no.- 2.3 such that it becomes complete dust and vermin proof. The door shall be provided with a handle and two nos. sealing arrangement.
- The compartment should be provided with two nos. cable entries with detachable plate with brass glands of appropriate size at the bottom suitable for 33KV XLPE cable for appropriate current rating.

The HT compartment shall be essentially contain the following:

- 33KV epoxy resin cast CT's (single phase) - 03nos.
- 33KV/√3/110V/√3 epoxy resin cast PT's (single phase) - 03nos.
- Flexible copper flat strip of 30 x 0.4mm or 8 SWG copper wire (duly insulated) to connect PT's to bus bar of CT's - 01set
- LT wiring for the secondary of CT & PT circuit, which should not less than 4 mm2 copper in size - 01set

An Aluminum foil plates shall be affixed on front side of cubicle to indicate the following information against which the desired information required to be painted at site:-

a) TPNODL/TPSODL/TPWODL/TPCODL Property
b) Name of the consumer
c) Service connection no.
d) Sanction load
e) Date of release of connection
f) Type of load cont./Non cont.
g) Meter no. &date
h) Line CTR/ PTR Meter CTR/PTR
i) Class of accuracy of CT- 0.2s
j) Class of accuracy of PT- 0.2
k) CT/PT M.F
l) Dial factor for energy/ for demand
m) Overall M.F. for energy/for demand
n) Date of last checking
o) Warranty period

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz: sl no of cubicle CT and PT ratio burden, class of accuracy, year of manufacturing, total weight, P.O. No. & date etc.

SEALING:

The metering cubicles shall be completely lockable and sealable with at least one locking and two sealing arrangements of the door of each compartment. Apart from sealing arrangement of both compartments, mounting bolts of CTs and PT shall have the provisions for sealing arrangement so that removal of CTs & PTs from the installed positions in the panel (for tampering/ replacement) by the unauthorized person is not possible without breaking/ tampering the sealing arrangement. The hinge arrangement, sealing of CTs and sealing of PTs shall be diagonally arranged in the base of each CTs & PTs. This sealing arrangement shall be checked by the officers at the time of checking of sample and during inspection. The epoxy resin casting of 33 kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum.

6. NAME PLATE & MARKING:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site: -

- TPNODL/TPCODL/TPSODL/TPWODL property
- Manufacturer's name
- PO No &Date
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class (0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection
- Warranty up to In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TEST:

CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certified by NABL and the reports shall not be less than an one year old. Calibration certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

ROUTINE, ACCEPTANCE. AND TYPETEST:

The following shall constitute the routine test, acceptance tests and type test.

Stage Inspection: The manufacturer should have the facility to show the stage inspection i.e during the period of FAT.
01 no of Sample from any Cubicle will be completely destroyed in the bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of cupper used for winding and HV test will be applied for minimum 5 minutes to check the insulation level and the cost for the testing will be borne by the manufacturer

CURRENT TRANSFORMERS:

- Verification of terminal marking and polarity.
- High voltage power frequency test on Primary winding
- High voltage power frequency test on Secondary winding
- Over voltage inter-turn test.
- Determination of errors according to the requirement of accuracy class (0.2s)
- Partial discharge test in accordance with IS: 11322/1985

POTENTIAL TRANSFORMER:

- Verification of terminal marking and polarity.
- Power frequency dry withstand test on Primary
- Power frequency withstand test on Secondary
- Determination of errors according to the requirement of accuracy class (0.2)
- Partial discharge test measurement test in accordance with IS:11322/1985.

8. **TYPE TEST CERTIFICATES**:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding 7 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

TYPE TEST:

- The following shall constitute the type tests as per relevant IS:
- Short-time current tests
- Temperature-rise test
- Lightning impulse test
- Power frequency withstand test
- Determination of errors according to the requirement of accuracy class.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subjected to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option bf the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to. rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or it's 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 TPCODL/TPNODL/TPSODL/TPWODL. 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 / Warrantee card
G. Other Documents applicable)

STAGE INSPECTION:

The manufacturer should have the facility to show the stage inspection i.e during the period of FAT.
01 no of sample from any cubicle will be completely destroyed in the bidder's laboratory in order to check the quality of resin cast , measurement of core weight ,quality of copper used for winding and HV test will be applied for minimum 5 minutes to check the insulation level and the cost for the testing will be borne by the manufacturer.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE PERIOD:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of **60 months from date of commissioning or 66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier.** The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any "latent defect" if noticed and reported to purchaser.

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**:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant. The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING Not Required:

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance test including partial discharge test as mentioned below. List of plant & machinery and test equipment available at manufacturer's works should necessarily be submitted along with tender.

17. **MANUFACTURING ACTIVITIES**:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARES, ACCESSORIES & TOOLS:

Not Applicable.

19. DRAWING & DOCUMENTS:

Following drawings and documents shall be prepared based on TPCODL/TPNODL/TPSODL/TPWODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) General arrangement for Metering cubicle
d) Power flow diagram
e) Foundation plan
f) Bill of material
g) Experience List

Type test certificates Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√

2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPSODL/TPWODL approval.

20. GENERAL TECHNICAL PARTICULAR:

CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters	Bidder's Offer
1	Normal system voltage (kV r.m.s)	33	
2	Highest system voltage (kV r.m.s)	36	
3	Frequency	50HZ	
4	Number of CT	3Nos	
5	Rated out put (VA burden)	15VA.	
6	Rated continuous thermal current	1.2 times of rated primary current	
7	Short time current rating for 1 sec.	6.4KA upto 20/5A for 1sec 13.1KA upto 100/5A for 1Sec 18.4KA above 100/5A for 1sec	
8	Rated dynamic current (Peak)	2.5 times of short time thermal current rating	
9	Instrument security factor	<5	
10	Impulse withstand voltage (KVpeak) (on assembled CT-PT set)	170 KVpeak	
11	. Maximum temperature rise ove maximum ambient temperature of 450C at rated continuous thermal current at rated frequency and with rated burden.	As per IS: 2705/ 1992 (Part-II)	
12	Short time thermal current rating	6.4 kA for 3 seconds	
13	Type of Insulation	E	
14	Max. ratio error	Within limited of IS:2705 with latest amendment/revision	
15	Max. phase angle error	Within limited of IS:2705fea with latest amendment/revision	

16	Rated voltage factor & time	1.2 times continuous and 1.5 times for 1 min	
17	System condition	Effectively earthed system	
18	Thickness of base plate	5mm	
19	Type	Dry type epoxy resin cast	
20	Creepage distance	900mm	
21	Transformation ratio/ CT ratio	As per above schedule of requirement.	
22	No. of cores	1 Nos	
23	Rated continuous thermal current temperature rise over ambient	As per IS:2705/ 1992	
24	One minute power frequency voltage withstand test on secondary winding	3KV	
25	Class of accuracy	0.2s	
26	Secondary termination	S1 & S2 shall be clearly marked	
27	CT primary current	5-400 A	
28	CT Secondary current	5A	
29	Total weight of the core before casting of resin	To be provided by Bidder	
30	Total weight of the unit after casting of resin	To be provided by Bidder	
31	Power frequency Dry withstand test on primary winding	70 KV rms	

Potential Transformer:

Sr. No	Particulars	Parameters	Bidder' Offer
1	Normal system voltage (kV r.m.s)	33	
2	Highest system voltage (kV r.m.s)	36	
3	Frequency	50HZ	
	Number of phases	Single phase	
4	No of PT	3 Nos	
5	Rated Output (VA) Burden	50VA	
6	Transformation ratio (PT ratio)	33KV/ √3/110V/√3	

7	Impulse withstand voltage (KVpeak) (on assembled CT PT set)	170	
a.	One minute power frequency dry withstand voltage (on assembled CT-PT set Primary (KVrms) Secondary (KVrms)	70	
b.	Class of accuracy	0.2	
8	Rated voltage factor and time	1.2 times continuous and 1.5 times for 30 sec	
9	System condition	Effectively earthed system	
10	Maximum temperature raise over maximum ambient temperature(which may be takenas450C) at rated frequency and with rated Burden	Within limited of IS: 3156 with latest amendment/ revision.	
11	Maximum ratio error	Within limited of IS: 3156 with latest amendment/ revision.	
12	Maximum phase angle error	Within limited of IS: 3156 with latest amendment/ revision.	
13	Type of Insulation	E	
14	Creepage distance	900mm	
15	Basic Insulation level	36/70/170 KV	

21. 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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1041

Specification Name : 33KV Resin cast single phase CT(5-400/5A)0.2s,15VA and Single phase PT 0.2,50VA for metering cubicle

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
15-02-2023	17-02-2023	17-02-2023	22-02-2023	22-02-2023	22-02-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1041 **Specification Name: :** Technical specification of 33KV single phase Resin Cast CT (5-400/5A) 15VA (Accuracy class 0.2s) & single phase PT 50VA (Accuracy class- 0.2) for 33KV Metering Cubicles.

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1041 **Specification Name:** Technical specification of 33KV single phase Resin Cast CT (5-400/5A) 15VA (Accuracy class 0.2s) & single phase PT 50VA (Accuracy class- 0.2) for 33KV Metering Cubicles.

1. SCOPE:

This specification covers the design, manufacture, assembly, testing at the manufacturer's works, supply & delivery at TPNODL/ TPSODL/TPWODL/TPCODL's stores/sites anywhere in ODISHA including unloading of indoor current & potential transformers of 33KV voltage class as specified in Schedule - A for metering services suitable for 33 KV .

2. APPLICABLE STANDARDS:

The indoor current & potential transformers unit and accessories covered by this specification shall comply with the requirement of the latest edition of the following standards unless otherwise stated in this specification.

- IS:16227 (Part-1 to 4): Specification for Instrument Transformers
- IS:2705/1992: Specification for current Transformers.
- IS 3156 (Part-I): Specification for potential Transformers.

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	300 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/TPCODL/TPWODL/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENT:

CURRENT TRANSFORMERS:

There shall be three number single core single ratio dry type epoxy high grade resin cast, current transformers conforming to IS: 2705/ 1992 of latest revision thereof as per details mentioned below: -

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	33
2	Highest system voltage (kV r.m.s)	36
3	Frequency	50HZ
4	Number of CT	3Nos
5	Rated out put (VA burden)	15VA.
6	Rated continuous thermal current	1.2 times of rated primary current
7	Short time current rating for 1 sec.	6.4KA upto 20/5A for 1sec 13.1KA upto 100/5A for 1Sec 18.4KA above 100/5A for 1sec
8	Rated dynamic current (Peak)	2.5 times of short time thermal current rating
9	Instrument security factor	<5
10	Impulse withstand voltage (KVpeak) (on assembled CT-PT set)	170 KVpeak
11	. Maximum temperature rise ove maximum ambient temperature of 450C at rated continuous thermal current at rated frequency and with rated burden.	As per IS: 2705/ 1992 (Part-II)
12	Short time thermal current rating	6.4 kA for 3 seconds
13	Type of Insulation	E
14	Max. ratio error	Within limited of IS:2705 with latest amendment/revision
15	Max. phase angle error	Within limited of IS:2705 with latest amendment/revision
16	Rated voltage factor & time	1.2 times continuous and 1.5 times for 1 min
17	System condition	Effectively earthed system
18	Thickness of base plate	5mm
19	Type	Dry type epoxy resin cast
20	Creepage distance	900mm

21	Transformation ratio/ CT ratio	As per above schedule of requirement.
22	No. of cores	1 Nos
23	Rated continuous thermal current temperature rise over ambient	As per IS:2705/ 1992
24	One minute power frequency voltage withstand test on secondary winding	3KV
25	Class of accuracy	0.2s
26	Secondary termination	S1 & S2 shall be clearly marked
27	CT Primary current	5-400
28	CT Secondary current	5A
29	Total weight of the core before casting of Resin	To be provided by Bidder
30	Total weight of the unit after casting of Resin	To be provided by Bidder
31	Thickness of base plate	5mm, Plate shall be properly galvanized with earthing arrangement

Short Circuit Rating of 33 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

N.B.- The dimension of the CT base plate should be **360mm** length form hole to hole and **170mm** width from hole to hole. The base plate should have open slot arrangement for adjustable fixing. Plate should be properly galvanized with earthing arrangement.

POTENTIAL TRANSFORMERS:

Details specification as per IS: 3156/ 1992 with latest amendments.

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	33
2	Highest system voltage (kV r.m.s)	36
3	Frequency	50HZ
	Number of phases	Single phase
4	No of PT	3 Nos
5	Rated Output (VA) Burden	50VA
6	Transformation ratio (PT ratio)	33KV/√3/ 110V/√3

7	Impulse withstand voltage (KVpeak) (on assembled CT PT set)	170
a.	One minute power frequency dry withstand voltage (on assembled CT-PT set Primary (KVrms) Secondary (KVrms)	70
b.	Class of accuracy	0.2
8	Rated voltage factor and time	1.2 times continuous and 1.5 times for 30 sec
9	System condition	Effectively earthed system
10	Maximum temperature raise over maximum ambient temperature(which may be takenas450C) at rated frequency and with rated Burden	Within limited of IS: 3156 with latest amendment/ revision.
11	Maximum ratio error	Within limited of IS: 3156 with latest amendment/ revision.
12	Maximum phase angle error	Within limited of IS: 3156 with latest amendment/ revision.
17	Type of Insulation	E
18	Creepage distance	900mm
19	Thickness of baseplate	5mm, Plate shall be properly galvanized with earthing arrangement.

N.B.- The dimension of the PT base plate should be **280mm** length form hole to hole and **250mm** width from hole to hole (the hole is slotted). The base plate should have open slot arrangement for adjustable fixing, with proper earthing arrangement diagonally.

5. GENERAL CONSTRUCTION:

Resin Cast Single phase CT (accuracy class-0.2s) & PT (accuracy class-0.2) for 33KV Metering Cubicle. The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to IS: 2705 (Part-I & II)/1992, Second Revision for CT and IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

The epoxy resin casting of 33 kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum.

6. NAME PLATE AND MARKING:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site:-

- TPNODL/TPCODL/TPWODL/TPSODL property
- Manufacturer's name
- PO No &Date
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class(0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TEST:

CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certified by NABL and the reports shall not be less than an one year old. Calibration certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

ROUTINE, ACCEPTANCE. AND TYPETEST:

The following shall constitute the routine test, acceptance tests and type test.

Stage Inspection:- The manufacturer should have the facility to show the stage inspection i.e during the period of FAT.
01 no of Sample will be completely destroyed in the bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of cupper used for winding and HV test will be applied for minimum 5 minutes to check the insulation level and the cost for the testing will be beared by the manufacturer

CURRENT TRANSFORMERS:

- Verification of terminal marking and polarity.
- High voltage power frequency test on Primary winding
- High voltage power frequency test on Secondary winding
- Over voltage inter-turn test.
- Determination of errors according to the requirement of accuracy class (0.2s).
- Partial discharge test in accordance with IS: 11322/1985.
- Any other test as per requirement of User group.

POTENTIAL TRANSFORMER:

- Verification of terminal marking and polarity.
- Power frequency dry withstand test on Primary
- Power frequency withstand test on Secondary
- Determination of errors according to the requirement of accuracy class (0.2)
- Partial discharge test measurement test in accordance with IS:11322/1985.
- Any other test as per requirement of User group.

TYPE TEST:

- The following shall constitute the type tests as per relevant IS:
- Short-time current tests
- Temperature-rise test
- Lightning impulse test
- Power frequency withstand test
- Determination of errors according to the requirement of accuracy class (0.2 for PT & 0.2s for CT).

8. TYPE Test Certificate:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPSODL/TPWODL/TPCODL.

Bids without all type test report shall stand disqualified.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's 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 TPNODL/TPCODL/TPWODL/TPSODL. Following documents shall be sent along with material.

a) Test reports
b) MDCC issued by TPNODL/TPCODL/TPWODL/TPSODL
c) Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Installation and maintenance Manual soft copy for CT-PT
i) Other Documents (as applicable)

STAGE INSPECTION:

The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 01 no of sample from any cubicle will be completely destroyed in the bidder's laboratory in order to check the quality of resin cast , measurement of core weight ,quality of copper used for winding and HV test will be applied for minimum 5 minutes to check the insulation level and the cost for the testing will be borne by the manufacturer.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE PERIOD:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this 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 Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at

Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be. In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.
The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING:

Not required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance test including partial discharge test as mentioned below. List of plant & machinery and test equipment available at manufacturer's works should necessarily be submitted along with tender.

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17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Not Applicable.

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPSODL/TPWODL/TPCODL specifications and statutory requirements and shall be submitted with the bid:

- Completely filled in Technical Particulars
- Any deviation sheet or No deviation
- General description of the equipment and all components including brochures.
- General arrangement drawing in enclosure
- Experience List
- All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/ TPSODL/TPWODL/TPCODL approval.

20. GENERAL TECHNICAL PARAMETER:

33KV CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	33
2	Highest system voltage (kV r.m.s)	36
3	Frequency	50HZ
4	Number of CT	3Nos
5	Rated out put (VA burden)	15VA.

6	Rated continuous thermal current	1.2 times of rated primary current
7	Short time current rating for 1 sec.	6.4KA upto 20/5A for 1sec 13.1KA upto 100/5A for 1Sec 18.4KA above 100/5A for 1sec
8	Rated dynamic current (Peak)	2.5 times of short time thermal current rating
9	Instrument security factor	<5
10	Impulse withstand voltage (KVpeak) (on assembled CT-PT set)	170 KVpeak
11	. Maximum temperature rise ove maximum ambient temperature of 450C at rated continuous thermal current at rated frequency and with rated burden.	As per IS: 2705/ 1992 (Part-II)
12	Short time thermal current rating	6.4 kA for 3 seconds
13	Type of Insulation	E
14	Max. ratio error	Within limited of IS:3156 with latest amendment/revision
15	Max. phase angle error	Within limited of IS:3156 with latest amendment/revision
16	Rated voltage factor & time	1.2 times continuous and 1.5 times for 1 min
17	System condition	Effectively earthed system
18	Thickness of base plate	5mm
19	Type	Dry type epoxy resin cast
20	Creepage distance	900mm
21	Transformation ratio/ CT ratio	As per above schedule of requirement.
22	No. of cores	1 Nos
23	Rated continuous thermal current temperature rise over ambient	As per IS:2705/ 1992
24	One minute power frequency voltage withstand test on secondary winding	3KV
25	Class of accuracy	0.2s
26	Secondary termination	S1 & S2 shall be clearly marked
27	CT Primary current	5-400
28	CT Secondary current	5A

29	Total weight of the core before casting of Resin	To be provided by Bidder
30	Total weight of the unit after casting of Resin	To be provided by Bidder
31	Thickness of baseplate	5mm, Plate should be properly galvanized with earthing arrangement.

33KV POTENTIAL TRANSFORMER:

Sr. No	Particulars	Parameters	Bidder's Offer
1	Normal system voltage (kV r.m.s)	33	
2	Highest system voltage (kV r.m.s)	36	
3	Frequency	50HZ	
	Number of phases	Single phase	
4	No of PT	3 Nos	
5	Rated Output (VA) Burden	50VA	
6	Transformation ratio (PT ratio)	33KV/√3/ 110V/√3	
7	Impulse withstand voltage (KVpeak) (on assembled CT PT set)	170	
a.	One minute power frequency dry withstand voltage (on assembled CT-PT set Primary (KVrms) Secondary (KVrms)	70	
b.	Class of accuracy	0.2	
8	Rated voltage factor and time	1.2 times continuous and 1.5 times for 30 sec	
9	System condition	Effectively earthed system	
10	Maximum temperature raise over maximum ambient temperature(which may be takenas450C) at rated frequency and with rated Burden	Within limited of IS: 3156 with latest amendment/ revision.	
11	Maximum ratio error	Within limited of IS: 3156 with latest amendment/ revision.	

12	Maximum phase angle error	Within limited of IS: 3156 with latest amendment/ revision.	
17	Type of Insulation	E	
18	Creepage distance	900mm	
19	Thickness of plate	5mm, Plate should be properly galvanized with earthing arrangement.	

21. 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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1041 **Specification Name:** Technical specification of 33KV single phase Resin Cast CT (5-400/5A) 15VA (Accuracy class 0.2s) & single phase PT 50VA (Accuracy class- 0.2) for 33KV Metering Cubicles.

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1042

Specification Name : 33KV (10-800A)-5A ,0.2s 10VA CT&0.2 class, 50VA PT OIL COOLED METERING UNIT

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
26-02-2023	27-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1042 **Specification Name:** 33 KV, 3P4W,10A-800A/5A,0.2s Accuracy class ,10VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

CONTENTS

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 33 KV, of different ratios, 3P4W, 0.2s accuracy class for CT & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633
- Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum

12	Average Dust storms prevailing in the area	150 days per annum

TPCODL/TPNODL/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL PARTICULAR REQUIREMENT:

4.1 Metering Unit Rating:-

The 11KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	33 KV
ii	Highest system voltage	36 KV
iii	Insulation level	70 KV RMS
iv	Standard Impulse withstand voltage	170 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	70 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	25KA for 1sec.
vii	Class of Accuracy	0.2s for CT & 0.2 for PT.
viii	Rated burden per Phase	For CTs : 10VA (10 – 800A/5A)
		For PTs : 50 VA (**33 KV /√3/ 110/√3)**
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	430 mm
xii	Shortest distance between metal part & earth	380 mm
	Type of Bushing	Porcelain
xiii	Creepage distance of HV bushing	900mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side
xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized

xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 120 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 33KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.
c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 Nitrogen gas filling shall be done to prevent absorption of moisture in the field for longer life of MU

5.1.3 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.4 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.5 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.6 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.7 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.8 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.9 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.10 The CTPT set should have Three CTs and One 3-phase PTs with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided**.** This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length, 2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 **Mounting Arrangement:**

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 **Oil:**

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 **Guaranteed Technical Particulars:**

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6. NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL..

7. Tests:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**
  1. Verification of terminal marking and polarity
  2. Temperature rise test.
  3. Lightning Impulse test
  4. High voltage Power frequency wet withstand voltage test.

5. Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

8. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerances:

Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection:

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a **random sample of 20 nos or 20% of the offered quantity** which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals

number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any "latent defect" if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos
6	HV bushings Outdoor	6 Nos

7	Secondary terminals bushings	As per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GURANTEED TECHNICAL PARTICULARS

For Supply of 33 KV, 3P4W, 0.2s accuracy class for CT & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	33 KV	
5	Highest System Voltage	36 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.2s	
iii	Rated output	10VA	
iv	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
v	Short time thermal current rating for 1 sec	25KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	33KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.2	
v	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary		

ii	Secondary	To be indicated in a separate sheet for each rating	
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	

V	Edge bending	To be provided in the Top Cover	
VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	900mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		

I	Primary terminals		
i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	430mm	
Ii	Shortest distance between metal part & earth	380 mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	
11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
12	Name Plate	As per tender requirement.	
13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
14	**Fittings**	As per tender clause 23.0	
15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
16	**Equi potential link**	02 nos of diagonally Cupper Strip i.e equ potential link to be provided	

			between top cover and bottom cover of the MU.		

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 33KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	
4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	

11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	30x10^{12} ohms- cm. 500x10^{12} ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5 x 10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50 x 10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	51 pm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1042 **Specification Name:** 33 KV, 3P4W,10A-800A/5A,0.2s Accuracy class ,10VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-EHV-1043

Specification Name : 33KV (10-800A)-1A ,0.2s 10VA CT&0.2 class, 50VA PT OIL COOLED METERING UNIT

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
26-02-2023	27-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1043 **Specification Name:** 33 KV, 3P4W,10A-800A/1A,0.2s Accuracy class ,10 VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1043 **Specification Name:** 33 KV, 3P4W,10A-800A/1A,0.2s Accuracy class ,10 VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 33 KV, of different ratios, 3P4W, 0.2s accuracy class for CT & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633
- Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum
12	Average Dust storms prevailing in the area	150 days per annum

TPNODL/TPSODL/TPCODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL PARTICULAR REQUIREMENT:

4.1 Metering Unit Rating:-

The 33 KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	33 KV
ii	Highest system voltage	36 KV
iii	Insulation level	70 KV RMS
iv	Standard Impulse withstand voltage	170 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	70 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	25KA for 1sec.
vii	Class of Accuracy	0.2s for CT & 0.2 for PT.
viii	Rated burden per Phase	For CTs : 10 VA (10 – 800A/1A)
		For PTs : 50 VA (**33 KV/√3/ 110/√3)**
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	430 mm
xii	Shortest distance between metal part & earth	380 mm
	Type of Bushing	Porcelain
xiii	Creepage distance of HV bushing	900mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side
xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized

xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 120 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 33KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.
c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 Nitrogen gas filling shall be done to prevent absorption of moisture in the field for longer life of MU.

5.1.3 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.4 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.5 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.6 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.7 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.8 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.9 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.10 The CTPT set should have Three CTs and One 3-phase PTs with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided**.** This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length, 2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 **Mounting Arrangement:**

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 **Oil:**

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 **Guaranteed Technical Particulars:**

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6. NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL..

7. Tests:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**
  1. Verification of terminal marking and polarity
  2. Temperature rise test.
  3. Lightning Impulse test
  4. High voltage Power frequency wet withstand voltage test.

5. Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

8. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerances:

Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection:

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a **random sample of 20 nos or 20% of the offered quantity** which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals

number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any "latent defect" if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos
6	HV bushings Outdoor	6 Nos

7	Secondary terminals bushings	As per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GURANTEED TECHNICAL PARTICULARS

For Supply of 33KV, 3P4W, 0.2s accuracy class for CT & 0.2 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	33 KV	
5	Highest System Voltage	36 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.2s	
iii	Rated output	10 VA	
iv	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
v	Short time thermal current rating for 1 sec	25KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	33KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.2	
v	Insulation level	70 KV_{rms}/ 170 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary		

ii	Secondary	To be indicated in a separate sheet for each rating	
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	

V	Edge bending	To be provided in the Top Cover	
VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	900mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		

I	Primary terminals		
i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	430mm	
Ii	Shortest distance between metal part & earth	380 mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	
11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
12	Name Plate	As per tender requirement.	
13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
14	**Fittings**	As per tender clause 23.0	
15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
16	**Equi potential link**	02 nos of diagonally Cupper Strip i.e equ potential link to be provided	

			between top cover and bottom cover of the MU.		

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 33KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	
4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	

11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	$30x10^{12}$ ohms- cm. $500x10^{12}$ ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5×10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50×10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	51 pm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-EHV-1043 **Specification Name:** 33 KV, 3P4W,10A-800A/1A,0.2s Accuracy class ,10 VA CT & 0.2 class ,50VA PT Combined, Oil Cooled Metering Units.

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2018

Specification Name : 11KV Resin cast single phase CT(5-50/5A)0.5s,15VA and Single phase PT 0.5,50VA for metering cubicle

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
25-01-2023	25-01-2023	25-01-2023	25-01-2023	25-01-2023	25-01-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2018 **Specification Name:** Technical Specification of 11KV single phase Resin Cast CT single phase (5A-50A/5A, Accuracy class 0.5s & 15VA) & single phase PT (Accuracy class- 0.5 & 50VA) for 11KV Metering Cubicle.

CONTENTS

1. SCOPE:

This specification covers the design, manufacture, assembly, testing at the manufacturer's works, supply & delivery at stores/sites anywhere in Odisha including unloading of indoor current & potential transformers of 11KV voltage class for metering services.

2. APPLICABLE STANDARDS:

The indoor current & potential transformers unit and accessories covered by this specification shall comply with the requirement of the latest edition of the following standards unless otherwise stated in this specification.

IS: 16227 (Part-1 to 4): Specification for Instrument Transformers.
IS:2705/1992: Specification for current Transformers.
IS 3156 (Part-I): Specification for potential Transformers.

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL. NO.	CONDTIONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	55 °C
3	Max. Daily average ambient temp	45 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g

15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS:

This specification covers the design, manufacture, testing and supply of 11KV Single phase resin cast CT (accuracy class-0.5s) and 11KV 3 no's single phase resin cast PT (accuracy class0.5). The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to IS: 2705 (Part-I & II)/1992, Second Revision for CT and IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

4.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	15 VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.5s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current

10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992
18	Creepage distance	300mm
19	CT ratio	5-50A/5A
20	1.5 micro seconds impulse withstand voltage test	75 Kvp
21	Total weight of core before casting of resin	To be provided by the Bidder
22	Total weight of core after casting of resin	To be provided by the Bidder
23	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	Single Phase (3 No's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28

b.	Secondary (kV r.m.s)	3
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.5
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds
17	Type of Insulation	E
18	Creepage distance	300mm
19	Total weight of core before casting of resin	To be provided by the Bidder
20	Total weight of core after casting of resin	To be provided by the Bidder
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

5.GENERAL CONSTRUCTION:

The epoxy resin casting of 11kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum.

5.1 CURRENT TRANSFORMERS

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type, with rated burden 15VA and accuracy class 0.5s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5. The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

Dimension : The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV epoxy resin cast PT per cubicles means separate PT per phase with rated burden 50VA and accuracy class 0.5 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)
. **Dimension:** The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing

6. NAME PLATE AND MARKING:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site:-

- TPNODL/TPCODL/TPWODL/TPSODL property
- Manufacturer's name
- PO No &Date
- Serial No of panel
- Panel CT ratio & accuracy class(0.5s)
- Panel PT ratio & accuracy class(0.5)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TESTS:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

7.1.1 CURRENT TRANSFORMERS:

a) Verification of terminal making and polarity.
b) High voltage power frequency test on Primary winding.
c) High voltage power frequency test on Secondary winding.
d) Over voltage inter-turn test.
e) Determination of errors according to the requirement of accuracy class (0.5s).
f) Partial discharge test in accordance with IS: 11322/1985.

7.1.2 POTENTIAL TRANSFORMERS:

a) Verification of terminal marking and polarity.
b) Power frequency dry withstand test on Primary.
c) Power frequency withstand test on secondary.
d) Determinations of errors according to the requirement of accuracy class (0.5).
e) Partial discharge test measurement test in accordance with IS: 11322/1985.

8. TYPE TEST CERTIFICATE:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding 7 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

The following shall constitute the **type tests** as per relevant IS

(a) Short-time current tests
(b) Temperature-rise test
(c) Lightning impulse test
(d) Power frequency withstand test
(e) Determination of errors according to the requirement of accuracy class (0.5 for PT & 0.5s for CT).

9. Pre-Dispatch Inspection:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's 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 TPNODL/TPCODL/TPWODL/TPSODL. Following documents shall be sent along with material.

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

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this 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 Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.

In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with

the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Not Applicable.

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

20. GUARANTED TECHNICAL PARAMETERS:

20.1 Current transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	15VA	
5	One-minute power frequency dry withstands voltage		
a	Primary (kV r.m.s)	28	
	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	
9	Class of accuracy	0.5s	
10	Extended current rating	120%	
11	Rated continuous thermal current	1.2 times of rated primary current	
12	Short time thermal current rating	6.4 kA for 3 seconds	
13	Rated dynamic current	2.5 times of short time thermal current rating	
14	Number of cores	One for each phase	
15	Instrument security factor	<5	
16	Type of Insulation	E	
17	Max. ratio error	As per IS:2705/1992	

18	Max. phase angle error	As per IS:2705/1992	
19	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	
20	Creepage distance	300mm	

20.2 Potential transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 Phase (3 no's PT)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	
10	Class of accuracy	0.5	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	
16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	

18	Creepage distance	300mm	

21.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:

Sl. No.	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2019

Specification Name : 11KV (5-50/5A,0.5s CLASS,15VA CT & 0.5 CLASS ,50VA PT) METERING CUBICLE

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
25-01-2023	25-01-2023	25-01-2023	25-01-2023	25-01-2023	25-01-2023

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 11 KV METERING CUBICLE**.**

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers: IS2705/1992
- Potential Transformers: IS 3156/1992
- HV Porcelain Bushing: IS 2099/1986
- Oil: IS 335/1983
- Electric strength for insulation oil: IS6792/1992
- Galvanization: IS 2633 Primary Terminals: IS 10601

This specification covers the design, manufacture, testing and supply of 11KV floor mounting indoor type metering cubicle having 3 nos. of Single-phase resin cast CT (accuracy class-0.5s) and 3 no. of 11KV single phase resin cast PT (accuracy class-0.5).

The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to

IS: 2705 (Part-I & II)/1992, Second Revision for CT and

IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

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	100%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 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/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. General Technical Requirement:

4.1 CURRENT TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	15 VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.5s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current
10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992

18	Creepage distance	300mm
19	CT ratio	5-50/5A

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	1PH (3 no's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.5
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds

17	Type of Insulation	E
18	Creepage distance	300mm

5. General Construction:

The metering panel shall be fabricated with 3mm M.S. plate (powder coated) and shall have external dimensions of 1700X850X800mm (height X width X depth). Total height including base channel will be 1750 to 1800 mm.

- The panel shall be dust and vermin proof and totally enclosed with IP 55. The panel shall have two separate compartments. The upper one shall provision to house tri-vector energy meter with associated wiring and shall be termed as "**Meter compartment**". The upper compartment will be double door type (inner door & outer door) and the arrangement for meter fixing will be in inner portion. The other section i.e. lower compartment shall house the 11 kV, 1-Ph, dry type epoxy resin casted CT (3 Nos.) and 11 kV, 1-Ph, dry type epoxy resin casted PT (3 No) and shall be termed as "**HT CT/PT Compartment**" A separate and independent vermin proof door shall be provided for each of the upper and lower compartments with provision of locking and sealing arrangement.

- The metering cubicle shall be totally enclosed and shall be provided within one no. hinged door made of MS sheet which shall rest on the collar along right sides of cubicle so that the door remains flushed with body of the cubicle.

- The door shall be provided with a handle and two no's sealing arrangement. There shall be one fixed (non-open able) window (approximate size 300 X 200 mm) fitted with transparent acrylic glass to enable the meter reader to note down the reading without opening the door of the panel. The glass shall be fitted / tightened with MS Frame form inside of window.

- The metering panel shall be provided with two nos. MS channel of size 100 X 50mm of 850mm length on the front and rear sides duly welded at the bottom of the panel. These shall have 4 holes of 16 mm for foundation bolts at both the ends of each channel. All the joints of the metering panel shall be welded to provide strong mechanical construction both for transportation as well as during its use. The metering panel shall have arrangement to connect it will earth at two independent points. One earthing knob/bolt shall also be provided in the "**Meter compartment**" for connection to star point of wiring. All three earthing bolts shall be provided with nuts and washers.

- The metering panel shall be cleaned suitably and will go through phospating using seven tank dipping procedure and its surface shall be made smooth. It shall be powder coated as per relevant IS specification. The colour of paints shall be decided at the event of order. Height of panel is fixed but width & depth is minimum and may be increased suitably to accommodate CTs/PTs, if required. Thus, total height including base channel will be 1750 mm. and the panel should be provided with 4 Nos. lifting hooks

- All the moving / mating edges shall be provided with synthetic/ semi synthetic gasket firmly glued to surface to make the metering panel dust & vermin proof. The metering panel shall be provided with two cable entries inside from bottom along with glands/ gland plate for 11 kV XLPE cable of various sizes corresponding the CTs ratio and short circuit current rating has to be provided. There should be suitable provision for clamping the of HT cable boxes has to be provided. There should be suitable provision so that cables boxes along with cable can be taken out of the panel without damage.
  - The meter compartment shall contain hanger arrangement of slotted angle for mounting of tri-vector energy meter having flexibility for moving meters vertically or horizontally. Clearance between all parts and compartments of panel should comply with relevant ISS standard; which shall be checked by TPNODL/TPSODL/TPCODL/TPWODL Utility.

Two 60 W space heater with thermostat must be kept on both corner side of the cubicle chamber with operating switch must kept outside.

5.1 SEALING:

The metering cubicles shall be completely lockable and sealable with at least one locking and two sealing arrangements of the door of each compartment. Apart from sealing arrangement of both compartments, mounting bolts of CTs and PT shall have the provisions for sealing arrangement so that removal of CTs & PTs from the installed positions in the panel (for tampering/ replacement) by the unauthorized person is not possible without breaking/ tampering the sealing arrangement. The hinge arrangement, sealing of CTs and sealing of PTs shall be diagonally arranged in the base of each CTs & PTs. This sealing arrangement shall be checked by the officers at the time of checking of sample and during inspection.

The epoxy resin casting of 11 kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum

5.2 ELECTRICAL COMPONENTS:

A brief details of the various components to be provided in the metering cubicle is given below: -

5.2.1 CURRENT TRANSFORMERS:

There shall be three number single core single ratio dry type epoxy resin cast, current transformers conforming to IS: 2705/ 1992 of latest revision thereof as per details mentioned below: -

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type,

with rated burden 15 VA and accuracy class 0.5s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5.

The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

No link/test terminals/terminals shall be provided in wire from CTs to meter terminals. . The base plate should have open slot arrangement for adjustable fixing. Insulation shall be class E.

Dimension: The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV single phase epoxy resin cast per cubicle with rated burden 50VA and accuracy class 0.5 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)

Dimension: The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

Insulation shall be class E.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. for one minute as per clause 9.3.1.1 of IS 3156 (Part-I).

(i) CTs bus bar:- 40X6mm copper strip or equivalent
(ii) PTs bus bar:- Copper wire 8SWG or flexible copper flat striper equivalent to connect PT or CT.
(iii) Wiring for CTs/PTs secondary circuits: - There should not be any joint/termination between CT/PT secondary terminals to meter terminals. Wiring of CTs and PTs should be done with 4 sqmm. stranded copper insulated conductor, CT wiring should run in independent flexible PVC pipes of appropriate size form HT compartment to meter compartment. The Pipe shall be so laid that no naked wire is visible. From pipes up to the metering the meter chamber, all wiring should be open and visible.

The dimension of the PT base plate should be 454 mm length form hole to hole and 264 mm width from hole to hole. The base plate should have open slot arrangement
for adjustable fixing.

6. NAME PLATE:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site: -

- TPNODL/TPCODL/TPSODL/TPWODL property
- Manufacturer's name
- PO No &Date
- Serial No of panel
- Panel CT ratio & accuracy class(0.5s)
- Panel PT ratio & accuracy class (0.5)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection
- Warranty up to

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TEST:

7.1 ROUTINE & ACCEPTANCE TEST :

The following shall constitute the routine test, acceptance tests and type test.

7.1.1 CURRENT TRANSFORMERS:

- Verification of terminal marking and polarity.
- High voltage power frequency test on Primary winding
- High voltage power frequency test on Secondary winding
- Over voltage inter-turn test.
- Determination of errors according to the requirement of accuracy class (0.5s).
- Partial discharge test in accordance with IS: 11322/1985

7.1.2 POTENTIAL TRANSFORMER:

- ❖ Verification of terminal marking and polarity.
- ❖ Power frequency dry withstand test on Primary
- ❖ Power frequency withstand test on Secondary
- ❖ Determination of errors according to the requirement of accuracy class (0.5)
- ❖ Partial discharge test measurement test in accordance with IS:11322/1985.

7.2 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding **7 years** from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

- ➢ The following shall constitute the type tests as per relevant IS:
- ➢ Short-time current tests
- ➢ Temperature-rise test
- ➢ Lightning impulse test
- ➢ Power frequency withstand test
- ➢ Determination of errors according to the requirement of accuracy class (0.5 for PT &0.5s for CT).

9. PRE-DISPATCH INSPECTION:

Equipment shall be subjected to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option bf the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to. rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or it's 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 TPCODL/TPNODL/TPSODL/TPWODL. 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 / Warrantee card
h) Other Documents applicable)

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE PERIOD:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of **60 months from date of commissioning or 66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier.** The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any “latent defect” if noticed and reported to purchaser.

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:

One numbers sample should be ready at the firms’ works after issue of LOA for new entrant. The sample shall be checked for its suitability and conformity with this specification. The drawing ofsample must be attached with bid documents showing all views of equipment

installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING Not Required

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry

out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance test including partial discharge test as mentioned below. List of plant & machinery and test equipment available at manufacturer's works should necessarily be submitted along with tender.

16.1 CALIBRATION

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certified by NABL and the reports shall not be less than an one year old. Calibration certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARES, ACCESSORIES & TOOLS:

Not Applicable.

19. DRAWING & DOCUMENTS:

Following drawings and documents shall be prepared based on TPCODL/TPNODL/TPSODL/TPWODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) General arrangement for Metering cubicle
d) Power flow diagram
e) Foundation plan
f) Bill of material
g) Experience List
h) Type test certificates

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√

2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPSODL/TPWODL approval.

20. GENERAL TECHNICAL PARTICULAR:

20.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters	Bidder's Offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	15 VA	
5	One-minute power frequency dry withstands voltage		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	
7	Class of accuracy	0.5s	
8	Extended current rating	120%	
9	Rated continuous thermal current	1.2 times of rated primary current	
10	Short time thermal current rating	6.4 kA for 3 seconds	
11	Rated dynamic current	2.5 times of short time thermal current rating	
12	Number of cores	One for each phase	
13	Instrument security factor	<5	
14	Type of Insulation	E	
15	Max. ratio error	As per IS:2705/1992	
16	Max. phase angle error	As per IS:2705/1992	
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	

18	Creepage distance	300mm	
19	1.5 micro seconds impulse withstand voltage test	75 Kvp	
20	Total weight of core before casting of resin	To be provided by the Bidder	
21	Total weight of core after casting of resin	To be provided by the Bidder	
22	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	
Potential Transformer			
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 (3 no's)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	
10	Class of accuracy	0.5	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	
16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	
18	Creepage distance	300mm	
19	Total weight of core before casting of resin	To be provided by the Bidder	

20	Total weight of core after casting of resin	To be provided by the Bidder	
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	

21. SCHEDULE OF DEVIATION:

(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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2031

Specification Name : 11KV Resin cast single phase CT(5-50/5A)0.2s,5VA and Single phase PT 0.2,50VA for metering cubicle

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
02-02-2023	02-02-2023	02-02-2023	02-02-2023	02-02-2023	02-02-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2031 **Specification Name:** Technical Specification of 11KV single phase Resin Cast CT single phase (5A-50A/5A, Accuracy class 0.2s & 5VA) & single phase PT (Accuracy class- 0.2 & 50VA) for 11KV Metering Cubicle.

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2031 **Specification Name:** Technical Specification of 11KV single phase Resin Cast CT single phase (5A-50A/5A, Accuracy class 0.2s & 5VA) & single phase PT (Accuracy class- 0.2 & 50VA) for 11KV Metering Cubicle.

1. SCOPE:

This specification covers the design, manufacture, assembly, testing at the manufacturer's works, supply & delivery at stores/sites anywhere in Odisha including unloading of indoor current & potential transformers of 11KV voltage class for metering services.

2. APPLICABLE STANDARDS:

The indoor current & potential transformers unit and accessories covered by this specification shall comply with the requirement of the latest edition of the following standards unless otherwise stated in this specification.

IS: 16227 (Part-1 to 4): Specification for Instrument Transformers.
IS:2705/1992: Specification for current Transformers.
IS 3156 (Part-I): Specification for potential Transformers.

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL. NO.	CONDTIONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	55 °C
3	Max. Daily average ambient temp	45 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g

15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS:

This specification covers the design, manufacture, testing and supply of 11KV Single phase resin cast CT (accuracy class-0.2s) and 11KV 3 no's single phase resin cast PT (accuracy class 0.2). The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to IS: 2705 (Part-I & II)/1992, Second Revision for CT and IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

4.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	5 VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.2s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current

10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992
18	Creepage distance	300mm
19	CT ratio	5-50A/5A
20	1.5 micro seconds impulse withstand voltage test	75 Kvp
21	Total weight of core before casting of resin	To be provided by the Bidder
22	Total weight of core after casting of resin	To be provided by the Bidder
23	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	Single Phase (3 No's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28

b.	Secondary (kV r.m.s)	3
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.2
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds
17	Type of Insulation	E
18	Creepage distance	300mm
19	Total weight of core before casting of resin	To be provided by the Bidder
20	Total weight of core after casting of resin	To be provided by the Bidder
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

5.GENERAL CONSTRUCTION:

The epoxy resin casting of 11kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum.

5.1 CURRENT TRANSFORMERS

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type, with rated burden 5VA and accuracy class 0.2s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5. The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

Dimension : The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV epoxy resin cast PT per cubicles means separate PT per phase with rated burden 50VA and accuracy class 0.2 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)
. **Dimension:** The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing

6. NAME PLATE AND MARKING:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site:-

- TPNODL/TPCODL/TPWODL/TPSODL property
- Manufacturer's name
- PO No &Date
- Date of Dispatch
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class (0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TESTS:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the

testing will be beared by the manufacturer.

7.1.1 CURRENT TRANSFORMERS:

a) Verification of terminal making and polarity.
b) High voltage power frequency test on Primary winding.
c) High voltage power frequency test on Secondary winding.
d) Over voltage inter-turn test.
e) Determination of errors according to the requirement of accuracy class (0.2s).
f) Partial discharge test in accordance with IS: 11322/1985.

7.1.2 POTENTIAL TRANSFORMERS:

a) Verification of terminal marking and polarity.
b) Power frequency dry withstand test on Primary.
c) Power frequency withstand test on secondary.
d) Determinations of errors according to the requirement of accuracy class (0.2).
e) Partial discharge test measurement test in accordance with IS: 11322/1985.

8. TYPE TEST CERTIFICATE:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

The following shall constitute the **type tests** as per relevant IS

(a) Short-time current tests
(b) Temperature-rise test
(c) Lightning impulse test
(d) Power frequency withstand test
(e) Determination of errors according to the requirement of accuracy class (0.2 for PT & 0.2s for CT).

9. Pre-Dispatch Inspection:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's 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 TPNODL/TPCODL/TPWODL/TPSODL. Following documents shall be sent along with material.

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

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this 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 Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.

In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Not Applicable.

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure

e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

20. GUARANTED TECHNICAL PARAMETERS:

20.1 Current transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	5VA	
5	One-minute power frequency dry withstands voltage		
a	Primary (kV r.m.s)	28	
	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	
9	Class of accuracy	0.2s	
10	Extended current rating	120%	
11	Rated continuous thermal current	1.2 times of rated primary current	
12	Short time thermal current rating	6.4 kA for 3 seconds	
13	Rated dynamic current	2.5 times of short time thermal current rating	
14	Number of cores	One for each phase	
15	Instrument security factor	<5	

16	Type of Insulation	E	
17	Max. ratio error	As per IS:2705/1992	
18	Max. phase angle error	As per IS:2705/1992	
19	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	
20	Creepage distance	300mm	

20.2 Potential transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 Phase (3 no's PT)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	
10	Class of accuracy	0.2	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	

16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	
18	Creepage distance	300mm	

21.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:

Sl. No.	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2032

Specification Name : 11KV (5-50/5A,0.2s CLASS,5VA CT & 0.2 CLASS ,50VA PT) METERING CUBICLE

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
02-02-2023	02-02-2023	02-02-2023	02-02-2023	02-02-2023	02-02-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2032 **Specification Name:** **TECHNICAL SPECIFICATION FOR 11KV (5-50/5A, 0.2s CLASS,5VA)CT & (0.2 CLASS, 50VA) PT METERING CUBICLE**

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 11 KV METERING CUBICLE**.**

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers: IS2705/1992
- Potential Transformers: IS 3156/1992
- HV Porcelain Bushing: IS 2099/1986
- Oil: IS 335/1983
- Electric strength for insulation oil: IS6792/1992
- Galvanization: IS 2633 Primary Terminals: IS 10601

This specification covers the design, manufacture, testing and supply of 11KV floor mounting indoor type metering cubicle having 3 nos. of Single-phase resin cast CT (accuracy class-0.2s) and 3 no. of 11KV single phase resin cast PT (accuracy class-0.2).

The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to

IS: 2705 (Part-I & II)/1992, Second Revision for CT and

IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

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	100%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 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/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. General Technical Requirement:

4.1 CURRENT TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	5 VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.2s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current
10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992

18	Creepage distance	300mm
19	CT ratio	5-50/5A

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	1PH (3 no's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.2
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds

17	Type of Insulation	E
18	Creepage distance	300mm

5. General Construction:

The metering panel shall be fabricated with 3mm M.S. plate (powder coated) and shall have external dimensions of 1700X850X800mm (height X width X depth). Total height including base channel will be 1750 to 1800 mm.

- The panel shall be dust and vermin proof and totally enclosed with IP 55. The panel shall have two separate compartments. The upper one shall provision to house tri-vector energy meter with associated wiring and shall be termed as "**Meter compartment**". The upper compartment will be double door type (inner door & outer door) and the arrangement for meter fixing will be in inner portion. The other section i.e. lower compartment shall house the 11 kV, 1-Ph, dry type epoxy resin casted CT (3 Nos.) and 11 kV, 1-Ph, dry type epoxy resin casted PT (3 No) and shall be termed as "**HT CT/PT Compartment**" A separate and independent vermin proof door shall be provided for each of the upper and lower compartments with provision of locking and sealing arrangement.

- The metering cubicle shall be totally enclosed and shall be provided within one no. hinged door made of MS sheet which shall rest on the collar along right sides of cubicle so that the door remains flushed with body of the cubicle.

- The door shall be provided with a handle and two no's sealing arrangement. There shall be one fixed (non-open able) window (approximate size 300 X 200 mm) fitted with transparent acrylic glass to enable the meter reader to note down the reading without opening the door of the panel. The glass shall be fitted / tightened with MS Frame form inside of window.

- The metering panel shall be provided with two nos. MS channel of size 100 X 50mm of 850mm length on the front and rear sides duly welded at the bottom of the panel. These shall have 4 holes of 16 mm for foundation bolts at both the ends of each channel. All the joints of the metering panel shall be welded to provide strong mechanical construction both for transportation as well as during its use. The metering panel shall have arrangement to connect it will earth at two independent points. One earthing knob/bolt shall also be provided in the "**Meter compartment**" for connection to star point of wiring. All three earthing bolts shall be provided with nuts and washers.

- The metering panel shall be cleaned suitably and will go through phospating using seven tank dipping procedure and its surface shall be made smooth. It shall be powder coated as per relevant IS specification. The colour of paints shall be decided at the event of order. Height of panel is fixed but width & depth is minimum and may be increased suitably to accommodate CTs/PTs, if required. Thus, total height including base channel will be 1750 mm. and the panel should be provided with 4 Nos. lifting hooks

- All the moving / mating edges shall be provided with synthetic/ semi synthetic gasket firmly glued to surface to make the metering panel dust & vermin proof. The metering panel shall be provided with two cable entries inside from bottom along with glands/ gland plate for 11 kV XLPE cable of various sizes corresponding the CTs ratio and short circuit current rating has to be provided. There should be suitable provision for clamping the of HT cable boxes has to be provided. There should be suitable provision so that cables boxes along with cable can be taken out of the panel without damage.
    - The meter compartment shall contain hanger arrangement of slotted angle for mounting of tri-vector energy meter having flexibility for moving meters vertically or horizontally. Clearance between all parts and compartments of panel should comply with relevant ISS standard; which shall be checked by TPNODL/TPSODL/TPCODL/TPWODL Utility.

Two 60 W space heater with thermostat must be kept on both corner side of the cubicle chamber with operating switch must kept outside.

5.1 SEALING:

The metering cubicles shall be completely lockable and sealable with at least one locking and two sealing arrangements of the door of each compartment. Apart from sealing arrangement of both compartments, mounting bolts of CTs and PT shall have the provisions for sealing arrangement so that removal of CTs & PTs from the installed positions in the panel (for tampering/ replacement) by the unauthorized person is not possible without breaking/ tampering the sealing arrangement. The hinge arrangement, sealing of CTs and sealing of PTs shall be diagonally arranged in the base of each CTs & PTs. This sealing arrangement shall be checked by the officers at the time of checking of sample and during inspection.

The epoxy resin casting of 11 kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum

5.2 ELECTRICAL COMPONENTS:

A brief details of the various components to be provided in the metering cubicle is given below: -

5.2.1 CURRENT TRANSFORMERS:

There shall be three number single core single ratio dry type epoxy resin cast, current transformers conforming to IS: 2705/ 1992 of latest revision thereof as per details mentioned below: -

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type,

with rated burden 5 VA and accuracy class 0.2s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5.

The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

No link/test terminals/terminals shall be provided in wire from CTs to meter terminals. . The base plate should have open slot arrangement for adjustable fixing. Insulation shall be class E.

Dimension: The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV single phase epoxy resin cast per cubicle with rated burden 50VA and accuracy class 0.2 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)

Dimension: The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

Insulation shall be class E.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. for one minute as per clause 9.3.1.1 of IS 3156 (Part-I).

(i) CTs bus bar:- 40X6mm copper strip or equivalent
(ii) PTs bus bar:- Copper wire 8SWG or flexible copper flat striper equivalent to connect PT or CT.
(iii) Wiring for CTs/PTs secondary circuits: - There should not be any joint/termination between CT/PT secondary terminals to meter terminals. Wiring of CTs and PTs should be done with 4 sqmm. stranded copper insulated conductor, CT wiring should run in independent flexible PVC pipes of appropriate size form HT compartment to meter compartment. The Pipe shall be so laid that no naked wire is visible. From pipes up to the metering the meter chamber, all wiring should be open and visible.

The dimension of the PT base plate should be 454 mm length form hole to hole and 264 mm width from hole to hole. The base plate should have open slot arrangement
for adjustable fixing.

6. NAME PLATE:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site: -

- TPNODL/TPCODL/TPSODL/TPWODL property
- Manufacturer's name
- PO No &Date
- Date of Dispatch
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class (0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection
- Warranty up to

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TEST:

7.1 ROUTINE & ACCEPTANCE TEST :

The following shall constitute the routine test, acceptance tests and type test.

7.1.1 CURRENT TRANSFORMERS:

- Verification of terminal marking and polarity.
- High voltage power frequency test on Primary winding
- High voltage power frequency test on Secondary winding
- Over voltage inter-turn test.
- Determination of errors according to the requirement of accuracy class (0.2s).
- Partial discharge test in accordance with IS: 11322/1985

7.1.2 POTENTIAL TRANSFORMER:

- Verification of terminal marking and polarity.
- Power frequency dry withstand test on Primary
- Power frequency withstand test on Secondary
- Determination of errors according to the requirement of accuracy class (0.2)
- Partial discharge test measurement test in accordance with IS:11322/1985.

7.2 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding **5 years** from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

- The following shall constitute the type tests as per relevant IS:
- Short-time current tests
- Temperature-rise test
- Lightning impulse test
- Power frequency withstand test
- Determination of errors according to the requirement of accuracy class (0.2 for PT &0.2s for CT).

9. PRE-DISPATCH INSPECTION:

Equipment shall be subjected to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option bf the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to. rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or it's 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 TPCODL/TPNODL/TPSODL/TPWODL. 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 / Warrantee card
h) Other Documents applicable)

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE PERIOD:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of **60 months from date of commissioning or 66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier.** The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any “latent defect” if noticed and reported to purchaser.

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:

One numbers sample should be ready at the firms’ works after issue of LOA for new entrant. The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment

installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING Not Required

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated

representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance test including partial discharge test as mentioned below. List of plant & machinery and test equipment available at manufacturer's works should necessarily be submitted along with tender.

16.1 CALIBRATION

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certified by NABL and the reports shall not be less than an one year old. Calibration certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARES, ACCESSORIES & TOOLS:

Not Applicable.

19. DRAWING & DOCUMENTS:

Following drawings and documents shall be prepared based on TPCODL/TPNODL/TPSODL/TPWODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) General arrangement for Metering cubicle
d) Power flow diagram
e) Foundation plan
f) Bill of material
g) Experience List
h) Type test certificates

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical	√		√

	Particulars (GTP)			
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPSODL/TPWODL approval.

20. GENERAL TECHNICAL PARTICULAR:

20.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters	Bidder's Offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	5 VA	
5	One-minute power frequency dry withstands voltage		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	
7	Class of accuracy	0.2s	
8	Extended current rating	120%	
9	Rated continuous thermal current	1.2 times of rated primary current	
10	Short time thermal current rating	6.4 kA for 3 seconds	
11	Rated dynamic current	2.5 times of short time thermal current rating	
12	Number of cores	One for each phase	
13	Instrument security factor	<5	
14	Type of Insulation	E	
15	Max. ratio error	As per IS:2705/1992	
16	Max. phase angle error	As per IS:2705/1992	
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	

18	Creepage distance	300mm	
19	1.5 micro seconds impulse withstand voltage test	75 Kvp	
20	Total weight of core before casting of resin	To be provided by the Bidder	
21	Total weight of core after casting of resin	To be provided by the Bidder	
22	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	
Potential Transformer			
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 (3 no's)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	
10	Class of accuracy	0.2	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	
16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	
18	Creepage distance	300mm	
19	Total weight of core before casting of resin	To be provided by the Bidder	

20	Total weight of core after casting of resin	To be provided by the Bidder	
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	

21. SCHEDULE OF DEVIATION:

(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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2033

Specification Name : 11KV, 3P4W, (5A-400A)/5A,0.5s ACCURACY CLASS, 15VA CT& 0.5 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS.

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
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TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
28-02-2023	28-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2033 **Specification Name:** 11KV, 3P4W, 5-400/5A,0.5s ACCURACY CLASS, 15VA CT& 0.5 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS**.**

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2033 **Specification Name:** 11KV, 3P4W, 5-400/5A,0.5s ACCURACY CLASS, 15VA CT& 0.5 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS**.**

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 11KV, of different ratio 3P4W, 0.5s accuracy class CT & 0.5 accuracy class PT, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633 Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum
12	Average Dust storms prevailing in the area	150 days per annum

TPCODL/TPNODL/TPSODL/TPCODL/TPWODL/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENT:

4.1 Metering Unit Rating:-

The 11KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	11 KV
ii	Highest system voltage	12 KV
iii	Insulation level	28 KV
iv	Standard Impulse withstand voltage	75 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	28 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	18.4KA for 1sec.
vii	Class of Accuracy	0.5s for CT & 0.5 for PT
viii	Rated burden per Phase	For CTs : 15 VA (5A-400A/5A)
		For PTs : 50 VA (11KV/ √3/ 110/√3)
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	255 mm
xii	Shortest distance between metal part & earth	190 mm
xiii	Creepage distance of HV bushing	300mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side
xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized

xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 45 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 11KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.
c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.3 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.4 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.5 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.6 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.7 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.8 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.9 The CTPT set should have Three CTs and One three phase PTs with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided**.** This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length,

2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 Mounting Arrangement:

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 Oil:

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 Guaranteed Technical Particulars:

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6.0 NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL.

7.0 TESTS:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**

- Verification of terminal marking and polarity
- Temperature rise test.
- Lightning Impulse test
- High voltage Power frequency wet withstand voltage test.
- Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerance: Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a random sample of 20 nos or 20% of the offered quantity which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before

acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free

replacement for another period of three years from the end of guarantee period for any “latent defect” if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms’ works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment’s available at manufacturer’s works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers

shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos
6	HV bushings Outdoor	6 Nos
7	Secondary terminals bushings	as per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GUARANTED TECHNICAL PARAMETERS:

For Supply of 11KV, 3P4W, 0.5s accuracy class for CT & 0.5 accuracy class for PT, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	11 KV	
5	Highest System Voltage	12 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.5s	
iii	Rated output	15 VA	
iv	Insulation level	28 KV_{rms}/ 75 KV_{pk}	

v	Short time thermal current rating for 1 sec	18.4 KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	11KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.5	
v	Insulation level	28 KV_{rms}/ 75 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary		

ii	Secondary	To be indicated in a separate sheet for each rating	
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	
V	Edge bending	To be provided in the Top Cover	
VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	300mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	

iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		
I	Primary terminals		
i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	255mm	
Ii	Shortest distance between metal part & earth	190mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	

	11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
	12	Name Plate	As per tender requirement.	
	13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
	14	**Fittings**	As per tender clause 23.0	
	15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
	16	**Equi potential link**	2 nos of diagonally Cupper Strip i.e equ potential link to be provided between top cover and bottom cover of the MU.	

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 11KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	

4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	
11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	$30x10^{12}$ ohms- cm. $500x10^{12}$ ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5×10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50×10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	50 ppm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2034

Specification Name : 11KV Resin cast single phase CT(5-50/5A)0.2s,10VA and Single phase PT 0.2,50VA for metering cubicle

SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
15-02-2023	17-02-2023	17-02-2023	22-02-2023	22-02-2023	22-02-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2034 **Specification Name:** Technical Specification of 11KV single phase Resin Cast CT single phase (5A-50A/5A, Accuracy class 0.2s & 10VA) & single phase PT (Accuracy class- 0.2 & 50VA) for 11KV Metering Cubicle.

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2034 **Specification Name:** Technical Specification of 11KV single phase Resin Cast CT single phase (5A-50A/5A, Accuracy class 0.2s & 10VA) & single phase PT (Accuracy class- 0.2 & 50VA) for 11KV Metering Cubicle.

1. SCOPE:

This specification covers the design, manufacture, assembly, testing at the manufacturer's works, supply & delivery at stores/sites anywhere in Odisha including unloading of indoor current & potential transformers of 11KV voltage class for metering services.

2. APPLICABLE STANDARDS:

The indoor current & potential transformers unit and accessories covered by this specification shall comply with the requirement of the latest edition of the following standards unless otherwise stated in this specification.

IS: 16227 (Part-1 to 4): Specification for Instrument Transformers.
IS:2705/1992: Specification for current Transformers.
IS 3156 (Part-I): Specification for potential Transformers.

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL. NO.	CONDTIONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	55 °C
3	Max. Daily average ambient temp	45 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g

15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g
16	Wind velocity	300 km/hr.

TPCODL/TPNODL/TPSODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS:

This specification covers the design, manufacture, testing and supply of 11KV Single phase resin cast CT (accuracy class-0.2s) and 11KV 3 no's single phase resin cast PT (accuracy class 0.2). The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to IS: 2705 (Part-I & II)/1992, Second Revision for CT and IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

4.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	10 VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.2s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current

10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992
18	Creepage distance	300mm
19	CT ratio	5-50A/5A
20	1.5 micro seconds impulse withstand voltage test	75 Kvp
21	Total weight of core before casting of resin	To be provided by the Bidder
22	Total weight of core after casting of resin	To be provided by the Bidder
23	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	Single Phase (3 No's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28

b.	Secondary (kV r.m.s)	3
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.2
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds
17	Type of Insulation	E
18	Creepage distance	300mm
19	Total weight of core before casting of resin	To be provided by the Bidder
20	Total weight of the unit after casting of resin	To be provided by the Bidder
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

5.GENERAL CONSTRUCTION:

The epoxy resin casting of 11kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum.

5.1 CURRENT TRANSFORMERS

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type, with rated burden 10VA and accuracy class 0.2s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5. The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

Dimension : The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV epoxy resin cast PT per cubicles means separate PT per phase with rated burden 50VA and accuracy class 0.2 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)
. **Dimension:** The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing

6. NAME PLATE AND MARKING:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site:-

- TPNODL/TPCODL/TPWODL/TPSODL property
- Manufacturer's name
- PO No &Date
- Date of Dispatch
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class (0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT & PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TESTS:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the

testing will be beared by the manufacturer.

7.1.1 CURRENT TRANSFORMERS:

a) Verification of terminal making and polarity.
b) High voltage power frequency test on Primary winding.
c) High voltage power frequency test on Secondary winding.
d) Over voltage inter-turn test.
e) Determination of errors according to the requirement of accuracy class (0.2s).
f) Partial discharge test in accordance with IS: 11322/1985.

7.1.2 POTENTIAL TRANSFORMERS:

a) Verification of terminal marking and polarity.
b) Power frequency dry withstand test on Primary.
c) Power frequency withstand test on secondary.
d) Determinations of errors according to the requirement of accuracy class (0.2).
e) Partial discharge test measurement test in accordance with IS: 11322/1985.

8. TYPE TEST CERTIFICATE:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

The following shall constitute the **type tests** as per relevant IS

(a) Short-time current tests
(b) Temperature-rise test
(c) Lightning impulse test
(d) Power frequency withstand test
(e) Determination of errors according to the requirement of accuracy class (0.2 for PT & 0.2s for CT).

9. Pre-Dispatch Inspection:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's 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 TPNODL/TPCODL/TPWODL/TPSODL. Following documents shall be sent along with material.

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

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this 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 Purchaser up to a period of at least 48 months from the date of commissioning or 60 months from the date of last supplies made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the " Security cum Performance Deposit" as the case may be.

In case of GP failure, BA shall report at site within 48 hours from intimation and arrange for rectification of fault within a mutually agreed time. In case rectification at site is not possible then alternative arrangement (replacement) to be made by BA within 15 days of intimation of failure.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment's available at manufacturer's works should necessarily be submitted along with bid documents.

16.1 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Not Applicable.

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure

e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

20. GUARANTED TECHNICAL PARAMETERS:

20.1 Current transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	10VA	
5	One-minute power frequency dry withstands voltage		
a	Primary (kV r.m.s)	28	
	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	
9	Class of accuracy	0.2s	
10	Extended current rating	120%	
11	Rated continuous thermal current	1.2 times of rated primary current	
12	Short time thermal current rating	6.4 kA for 3 seconds	
13	Rated dynamic current	2.5 times of short time thermal current rating	
14	Number of cores	One for each phase	
15	Instrument security factor	<5	

16	Type of Insulation	E	
17	Max. ratio error	As per IS:2705/1992	
18	Max. phase angle error	As per IS:2705/1992	
19	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	
20	Creepage distance	300mm	

20.2 Potential transformer:

Sr. No	Particulars	Parameters	Bidder's offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 Phase (3 no's PT)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	
10	Class of accuracy	0.2	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	

16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	
18	Creepage distance	300mm	
19	Total weight of core before casting of resin	To be provided by the Bidder	
20	Total weight of the unit after casting of resin	To be provided by the Bidder	
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	

21.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:

Sl. No.	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2035

Specification Name : 11KV (5-50/5A,0.2s CLASS,10VA CT & 0.2 CLASS ,50VA PT) METERING CUBICLE

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
23-02-2023	26-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2035 **Specification Name:** **TECHNICAL SPECIFICATION FOR 11KV (5-50/5A, 0.2s CLASS,10VA) RESIN CAST CT & (0.2 CLASS, 50VA) RESIN CAST PT METERING CUBICLE**

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 11 KV METERING CUBICLE**.**

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers: IS2705/1992
- Potential Transformers: IS 3156/1992
- HV Porcelain Bushing: IS 2099/1986
- Oil: IS 335/1983
- Electric strength for insulation oil: IS6792/1992
- Galvanization: IS 2633 Primary Terminals: IS 10601

This specification covers the design, manufacture, testing and supply of 11KV floor mounting indoor type metering cubicle having 3 nos. of Single-phase resin cast CT (accuracy class-0.2s) and 3 no. of 11KV single phase resin cast PT (accuracy class-0.2).

The tenders from only such firms shall be accepted who themselves manufacture metering cubicle of the relevant design conforming to

IS: 2705 (Part-I & II)/1992, Second Revision for CT and

IS: 3156(Part-I & II)/1992, Second Revision for PT and have obtained type test certificates.

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	300 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/TPWODL/TPSODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. General Technical Requirement:

4.1 CURRENT TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	Rated Output (VA) Burden	10VA
5	One-minute power frequency dry withstands voltage	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s
7	Class of accuracy	0.2s
8	Extended current rating	120%
9	Rated continuous thermal current	1.2 times of rated primary current
10	Short time thermal current rating	6.4 kA for 3 seconds
11	Rated dynamic current	2.5 times of short time thermal current rating
12	Number of cores	One for each phase
13	Instrument security factor	<5
14	Type of Insulation	E
15	Max. ratio error	As per IS:2705/1992
16	Max. phase angle error	As per IS:2705/1992
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992

18	Creepage distance	300mm
19	CT ratio	5-50/5A
21	Total weight of core before casting of resin	To be provided by the Bidder
22	Total weight of the unit after casting of resin	To be provided by the Bidder
23	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement

Short Circuit Rating of 11 kV CTs: -

- 6.4KA upto 20/5A for 1sec
- 13.1KA upto 100/5A for 1Sec
- 18.4KA above 100/5A for 1sec

4.2 POTENTIAL TRANSFORMER:-

Sr. No	Particulars	Parameters
1	Normal system voltage (kV r.m.s)	11
2	Highest system voltage (kV r.m.s)	12
3	Frequency	50HZ
4	No of phases	1PH (3 no's)
5	Rated Output (VA) Burden	50VA
6	Impulse withstand voltage (kVp)	75kVp
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)	
a.	Primary (kV r.m.s)	28
b.	Secondary (kV r.m.s)	3

8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3
10	Class of accuracy	0.2
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992
14	Max. Phase angle error	Within limits of IS:3156/1992
15	Max. Ratio error	Within limits of IS:3156/1992
16	Short time thermal current rating	6.4 kA for 3 seconds
17	Type of Insulation	E
18	Creepage distance	300mm

5. General Construction:

The metering panel shall be fabricated with 3mm M.S. plate (powder coated) and shall have external dimensions of 1700X850X800mm (height X width X depth). Total height including base channel will be 1750 to 1800 mm.

- The panel shall be dust and vermin proof and totally enclosed with IP 55. The panel shall have two separate compartments. The upper one shall provision to house tri-vector energy meter with associated wiring and shall be termed as "**Meter compartment**". The upper compartment will be double door type (inner door & outer door) and the arrangement for meter fixing will be in inner portion. The other section i.e. lower compartment shall house the 11 kV, 1-Ph, dry type epoxy resin casted CT (3 Nos.) and 11 kV, 1-Ph, dry type epoxy resin casted PT (3 No) and shall be termed as "**HT CT/PT Compartment**" A separate and independent vermin proof door shall be provided for each of the upper and lower compartments with provision of locking and sealing arrangement.

- The metering cubicle shall be totally enclosed and shall be provided within one no. hinged door made of MS sheet which shall rest on the collar along right sides of cubicle so that the door remains flushed with body of the cubicle.

- The door shall be provided with a handle and two no's sealing arrangement. There shall be one fixed (non-open able) window (approximate size 300 X 200 mm) fitted with transparent acrylic glass to enable the meter reader to note down the reading without opening the door of the panel. The glass shall be fitted / tightened with MS Frame form inside of window.

- The metering panel shall be provided with two nos. MS channel of size 100 X 50mm of 850mm length on the front and rear sides duly welded at the bottom of the panel. These shall have 4 holes of 16 mm for foundation bolts at both the ends of each channel. All the joints of the metering panel shall be welded to provide strong mechanical construction both for transportation as well as during its use. The metering panel shall have arrangement to connect it will earth at two independent points. One earthing knob/bolt shall also be provided in the "**Meter compartment**" for connection to star point of wiring. All three earthing bolts shall be provided with nuts and washers.

- The metering panel shall be cleaned suitably and will go through phospating using seven tank dipping procedure and its surface shall be made smooth. It shall be powder coated as per relevant IS specification. The colour of paints shall be decided at the event of order. Height of panel is fixed but width & depth is minimum and may be increased suitably to accommodate CTs/PTs, if required. Thus, total height including base channel will be 1750 mm. and the panel should be provided with 4 Nos. lifting hooks

- All the moving / mating edges shall be provided with synthetic/ semi synthetic gasket firmly glued to surface to make the metering panel dust & vermin proof. The metering panel shall be provided with two cable entries inside from bottom along with glands/ gland plate for 11 kV XLPE cable of various sizes corresponding the CTs ratio and short circuit current rating has to be provided. There should be suitable provision for clamping the of HT cable boxes has to be provided. There should be suitable provision so that cables boxes along with cable can be taken out of the panel without damage.
    - The meter compartment shall contain hanger arrangement of slotted angle for mounting of tri-vector energy meter having flexibility for moving meters vertically or horizontally. Clearance between all parts and compartments of panel should comply with relevant ISS standard; which shall be checked by TPNODL/TPSODL/TPCODL/TPWODL Utility.

Two 60 W space heater with thermostat must be kept on both corner side of the cubicle chamber with operating switch must kept outside.

5.1 SEALING:

The metering cubicles shall be completely lockable and sealable with at least one locking and two sealing arrangements of the door of each compartment. Apart from sealing arrangement of both compartments, mounting bolts of CTs and PT shall have the provisions for sealing arrangement so that removal of CTs & PTs from the installed positions in the panel (for tampering/ replacement) by the unauthorized person is not possible without breaking/ tampering the sealing arrangement. The hinge arrangement, sealing of CTs and sealing of PTs shall be diagonally arranged in the base of each CTs & PTs. This sealing arrangement shall be checked by the officers at the time of checking of sample and during inspection.

The epoxy resin casting of 11 kV CTs & PTs coils is required to be carried out under vacuum to avoid any blow holes in the casted material. To establish this Epoxy hardener

and accelerator, if any is mixed in the mixing chamber under the vacuum and poured into the dyes placed in the casting chamber which is also kept under vacuum as per relevant IS specifications. The temperature as specified by the Epoxy manufacturer is maintained with thermostatic control so that all the moisture is also drained out under vacuum

5.2 ELECTRICAL COMPONENTS:

A brief details of the various components to be provided in the metering cubicle is given below: -

5.2.1 CURRENT TRANSFORMERS:

There shall be three number single core single ratio dry type epoxy resin cast, current transformers conforming to IS: 2705/ 1992 of latest revision thereof as per details mentioned below: -

The metering CTs shall be suitable for 11kV, 50Hz, Single phase effectively earthed neutral system. The CT Shall be single core, single ratio, epoxy resin cast, copper wound primary type, with rated burden 10VA and accuracy class 0.2s or better and conforming to IS: 2705 (Part-I & II) with latest amendment. The ratio of CTs shall be as per schedule of requirement. The instrument security factor (ISF) shall up to 5.

The secondary terminals of the CTs shall be robust design so as to provide effective and firm termination. The secondary winding resistance of CTs shall be as low as possible. Colour coding viz. Red/Yellow/Blue for main and black for Neutral shall be used. Further, the load side wires shall be provided with Red/Yellow/Blue PVC type rings at both ends for identification. 1S1 & 1S2 shall be used for identification of main and load wires and ferrules shall be used accordingly. No other symbols other than 1S1 & 1S2 shall be accepted without prior approval.

No link/test terminals/terminals shall be provided in wire from CTs to meter terminals. . The base plate should have open slot arrangement for adjustable fixing. Insulation shall be class E.

Dimension: The dimension of the 11kv CT base plate should be 285mm length form hole to hole and 140mm width from hole to hole. The base plate should have open slot arrangement for adjustable fixing.

5.2.2 POTENTIAL TRANSFORMERS:

The PTs shall be indoor dry type epoxy resin cast, copper wound suitable for 11kV 50Hz, effectively earthed neutral system. There shall be 3 Nos 11 kV single phase epoxy resin cast per cubicle with rated burden 50VA and accuracy class 0.2 or better and conforming to IS: 3156 (Part-I &II) with latest amendment. Colour coding viz Red/Yellow/Blue shall be used for identification of phases and black for Neutral. The PT shall be type tested in accordance with IS: 3156 (Part-I & II) with latest amendment.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. For one minute as per clause 9.3.1.1 of IS 3156 (Part-I)

Dimension: The dimension of the 11kV PT base plate should be 270 mm length form hole to hole and 125 mm width from hole to hole. The base plate should have open slot arrangement for

adjustable fixing.

Insulation shall be class E.

The PTs shall be uniform insulating and withstand separate source 28 kV Pf. for one minute as per clause 9.3.1.1 of IS 3156 (Part-I).

(i) CTs bus bar:- 40X6mm copper strip or equivalent
(ii) PTs bus bar:- Copper wire 8SWG or flexible copper flat striper equivalent to connect PT or CT.
(iii) Wiring for CTs/PTs secondary circuits: - There should not be any joint/termination between CT/PT secondary terminals to meter terminals. Wiring of CTs and PTs should be done with 4 sqmm. stranded copper insulated conductor, CT wiring should run in independent flexible PVC pipes of appropriate size form HT compartment to meter compartment. The Pipe shall be so laid that no naked wire is visible. From pipes up to the metering the meter chamber, all wiring should be open and visible.

The dimension of the PT base plate should be 454 mm length form hole to hole and 264 mm width from hole to hole. The base plate should have open slot arrangement
for adjustable fixing.

6. NAME PLATE:

An Aluminum foil plate shall be affixed on the front of cubicle to indicate the following information against which the desired information is required to be painted at site: -

- TPNODL/TPCODL/TPSODL/TPWODL property
- Manufacturer's name
- PO No &Date
- Date of Dispatch
- Serial No of panel
- Panel CT ratio & accuracy class(0.2s)
- Panel PT ratio & accuracy class (0.2)
- Meter CT ratio
- Meter PT ratio
- Over all CT-PT multiplying factor
- Sanctioned load
- Date of release of connection
- Warranty up to

In addition to the above, one no. rating and diagram plate made of Aluminum shall be provided on the front door of the HT compartment giving details viz. Serial no. of cubicle CT &

PT,ratio,burden,classofaccuracy,yearofmanufacturing,totalweight,P.ONo.anddate etc.

7. TEST:

7.1 ROUTINE & ACCEPTANCE TEST :

The following shall constitute the routine test, acceptance tests and type test.

7.1.1 CURRENT TRANSFORMERS:

- Verification of terminal marking and polarity.
- High voltage power frequency test on Primary winding
- High voltage power frequency test on Secondary winding
- Over voltage inter-turn test.
- Determination of errors according to the requirement of accuracy class (0.2s).
- Partial discharge test in accordance with IS: 11322/1985

7.1.2 POTENTIAL TRANSFORMER:

- Verification of terminal marking and polarity.
- Power frequency dry withstand test on Primary
- Power frequency withstand test on Secondary
- Determination of errors according to the requirement of accuracy class (0.2)
- Partial discharge test measurement test in accordance with IS:11322/1985.

7.2 CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

8. TYPE TEST CERTIFICATES:

The Bidder shall furnish the type test certificates of the offered product in bid for the tests as mentioned as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA or any other International Laboratory as per the relevant standards of IS and IEC. Type tests shall have been conducted in certified Test laboratories during the period not exceeding **5 years** from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPNODL/TPCODL/TPWODL/TPSODL.

Bids without all type test report shall stand disqualified.

- The following shall constitute the type tests as per relevant IS:
- Short-time current tests
- Temperature-rise test

- Lightning impulse test
- Power frequency withstand test
- Determination of errors according to the requirement of accuracy class (0.2 for PT &0.2s for CT).

9. PRE-DISPATCH INSPECTION:

Equipment shall be subjected to inspection by a duly authorized representative of the TPCODL/TPNODL/TPSODL/TPWODL. Inspection may be made at any stage of manufacture at the option bf the purchaser and the equipment if found unsatisfactory as to workmanship or material is liable to. rejection. Supplier shall grant free access to the places of manufacture to TPCODL/TPNODL/TPSODL/TPWODL's representatives at all times when the work is in progress. Inspection by the TPCODL/TPNODL/TPSODL/TPWODL or it's 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 TPCODL/TPNODL/TPSODL/TPWODL. 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 / Warrantee card
h) Other Documents applicable)

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL/TPNODL/TPSODL/TPWODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Project Engineering department.

11. GUARANTEE PERIOD:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of **60 months from date of commissioning or 66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier.** The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free replacement for another period of three years from the end of guarantee period for any “latent defect” if noticed and reported to purchaser.

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:

One numbers sample should be ready at the firms' works after issue of LOA for new entrant. The sample shall be checked for its suitability and conformity with this specification. The drawing ofsample must be attached with bid documents showing all views of equipment

installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING Not Required

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance test including partial discharge test as mentioned below. List of plant & machinery and test equipment available at manufacturer's works should necessarily be submitted along with tender.

16.1 CALIBRATION

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certified by NABL and the reports shall not be less than an one year old. Calibration certifications when demanded by inspecting officers shall be provided/ produced for verification purpose.

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARES, ACCESSORIES & TOOLS:

Not Applicable.

19. DRAWING & DOCUMENTS:

Following drawings and documents shall be prepared based on TPCODL/TPNODL/TPSODL/TPWODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) General description of the equipment and all components including brochures.
c) General arrangement for Metering cubicle
d) Power flow diagram
e) Foundation plan
f) Bill of material
g) Experience List
h) Type test certificates

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPSODL/TPWODL approval.

20. GENERAL TECHNICAL PARTICULAR:

20.1 CURRENT TRANSFORMER:

Sr. No	Particulars	Parameters	Bidder's Offer
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	Rated Output (VA) Burden	10VA	
5	One-minute power frequency dry withstands voltage		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
6	One minute power frequency wet withstands voltage (kVp)	√2x28 r.m.s	

7	Class of accuracy	0.2s	
8	Extended current rating	120%	
9	Rated continuous thermal current	1.2 times of rated primary current	
10	Short time thermal current rating	6.4 kA for 3 seconds	
11	Rated dynamic current	2.5 times of short time thermal current rating	
12	Number of cores	One for each phase	
13	Instrument security factor	<5	
14	Type of Insulation	E	
15	Max. ratio error	As per IS:2705/1992	
16	Max. phase angle error	As per IS:2705/1992	
17	Max. temp. rise over max. ambient temp. of 45 deg. C at rated continuous thermal current at rated frequency and with rated burden.	As per IS:2705/1992	
18	Creepage distance	300mm	
19	1.5 micro seconds impulse withstand voltage test	75 Kvp	
20	Total weight of core before casting of resin	To be provided by the Bidder	
21	Total weight of the unit after casting of resin	To be provided by the Bidder	
22	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	
Potential Transformer			
1	Normal system voltage (kV r.m.s)	11	
2	Highest system voltage (kV r.m.s)	12	
3	Frequency	50HZ	
4	No of phases	1 (3 no's)	
5	Rated Output (VA) Burden	50VA	
6	Impulse withstand voltage (kVp)	75kVp	
7	One-minute power frequency dry withstands voltage (on assembled CTPT UNIT)		
a.	Primary (kV r.m.s)	28	
b.	Secondary (kV r.m.s)	3	
8	One minute power frequency wet withstands voltage ((on assembled CTPT UNIT)	√2x28 r.m.s	
9	Transformation ratio (PT Ratio)	11 KV/√3/ 110V/√3	

10	Class of accuracy	0.2	
11	Winding connection	Star/Star. Primary Neutral floating. LT neutral to be earthed in the metering box.	
12	Rated voltage factor and time	1.2 continuous and 1.9 for 30 seconds.	
13	Temp. rise over max. ambient temp.	Within limits of IS:3156/1992	
14	Max. Phase angle error	Within limits of IS:3156/1992	
15	Max. Ratio error	Within limits of IS:3156/1992	
16	Short time thermal current rating	6.4 kA for 3 seconds	
17	Type of Insulation	E	
18	Creepage distance	300mm	
19	Total weight of core before casting of resin	To be provided by the Bidder	
20	Total weight of core after casting of resin	To be provided by the Bidder	
21	Thickness of Baseplate	5 mm & plate should be properly galvanized with earthing arrangement	

21. SCHEDULE OF DEVIATION:

(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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-HV-2037

Specification Name : 11KV, 3P4W, (5A-400A)/5A,0.2s ACCURACY CLASS, 15VA CT& 0.2 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS

Prepared by	Reviewed by	Reviewed by	Reviewed by	Approved by	Released by
SHANTAPRIYA JENA	Vijender Goyal	K GOVINDARAJ	SATYA PRASAD NAYAK	TAPAN KUMAR BEHERA	SANDIP PAL
TPNODL	TPSODL	TPWODL	TPCODL	TPNODL	TPNODL
23-02-2023	24-02-2023	06-03-2023	13-03-2023	13-03-2023	13-03-2023

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2037 **Specification Name:** 11KV, 3P4W, 5-400/5A,0.2s ACCURACY CLASS, 15VA CT& 0.2 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS**.**

CONTENTS

TPCODL TPNODL TPWODL TPSODL	**Specification No:** ENG-HV-2037 **Specification Name:** 11KV, 3P4W, 5-400/5A,0.2s ACCURACY CLASS, 15VA CT& 0.2 CLASS ,50VA PT COMBINED, OIL COOLED METERING UNITS**.**

1. SCOPE:

This specification covers designing, manufacturing, assembling, stage testing, inspection, supply, loading at factory, transportation to stores, unloading at stores of 11KV, of different ratio 3P4W, 0.2s accuracy class CT & 0.2 accuracy class PT, CTPT Combined, Oil Cooled Metering Units.

2. APPLICABLE STANDARDS:

Except where modified by this specification the component parts of the equipment shall comply with the following IS available (the latest versions).

- Current Transformers :IS2705/1992
- Potential Transformers : IS 3156/1992
- HV Porcelain Bushing :IS 2099/1986
- Oil : IS 335/1983
- Electric strength for insulation oil : IS6792/1992
- Galvanization: IS 2633 Primary Terminals : IS 10601

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	300 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)
11	Average Thunderstorms prevailing in the area	90 days per annum
12	Average Dust storms prevailing in the area	150 days per annum

TPNODL/TPSODL/TPCODL/TPWODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENT:

4.1 Metering Unit Rating:-

The 11KV, 3P4W, CTPT sets shall have the following ratings.

i	Rated Voltage	11 KV
ii	Highest system voltage	12 KV
iii	Insulation level	28 KV
iv	Standard Impulse withstand voltage	75 KV Peak
v	One minute power frequency withstand Voltage	
a)	Primary:	28 KV
b)	Secondary	3 KV
vi	Short time thermal current and its duration	18.4KA for 1sec.
vii	Class of Accuracy	0.2s for CT & 0.2 for PT
viii	Rated burden per Phase	For CTs : 15 VA (5A-400A/5A)
		For PTs : 50 VA (11KV/ √3/ 110/√3)
ix	Frequency	50 HZ
x	Maximum attainable winding temperature	80 deg C
xi	Minimum Phase to Phase distance	255 mm
xii	Shortest distance between metal part & earth	190 mm
xiii	Creepage distance of HV bushing	300mm (Min)
xiv	Thickness of MS Tank	Min 5mm for top cover & 3.15 mm bottom & all other side
xv	Galvanization	Entire tank including secondary chamber shall be hot dip galvanized

xvi	Bi-metallic terminal connector	Bi-metallic terminal connector with a nut, plane washer, spring washer & check nut suitable for aluminum conductor required for different rating of metering units. Six nos to be provided with each metering units.
xvii	Minimum volume of oil	Shall not be less than 45 ltrs.

4.2 Metering Unit Type:-

a) The 3P4W, metering transformer equipment should be of pole mounting type for outdoor use.
b) They are to be used in 11KV Three Phase system with solidly earthed neutral and should also be suitable for 3 Phase 3 Wire 50 Hz network.
c) The equipment is required for operation of HT Tri-vector Meters and should be oil cooled.

5. CONSTRUCTION:

5.1 Design:

5.1.1 The equipment shall be designed to ensure satisfactory operation under all conditions of service to facilitate easy inspection, cleaning and repairs.

5.1.2 The design shall incorporate every reasonable precaution and provisions for safety of all those concerned in the operation and maintenance of the equipment. **A pressure relief valve with metallic cap** shall be invariably provided to the CTPT set. It shall be provided at the top cover of the tank.

All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top cover of the tank, secondary terminal cover, inspection chamber cover plate may be designed accordingly. All outdoor apparatus shall be so designed that water cannot collect at any point and enter the CT/PT set. The top covers of the tank, secondary terminal cover, inspection chamber cover plate are suitable bent at the edges **(at least 25mm bent)** so that the gaskets are not exposed to moisture.

5.1.3 All connections and terminals shall be of sufficient size for carrying the specified currents continuously without undue heating.

5.1.4 All bolts, nuts, washers in contact with non-ferrous parts shall be of brass.

5.1.5 All ferrous parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.

5.1.6 The secondary terminal box with double door arrangement (Inner & Outer) and oil gauge shall be provided with Metering Units. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.

5.1.7 The core shall be high grade non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy, at both normal and over current/voltage.

5.1.8 All winding shall be of insulated high grade Electrolytic copper wire and the manufacturing of the units shall be done in completely closed and air-conditioned room otherwise Fiber glass insulation sleeves are to be provided for primary winding. Details of winding and core shall be furnished.

5.1.9 The CTPT set should have Three CTs and One three phase PTs with star / star connection.

5.2 Sealing:

Sealing bolts for sealing at 4 points on the secondary terminal box (both inner & outer door)and the top cover of the tank shall be provided**.** This may be made by providing a hole on tail of corner bolts of adequate size to pass the sealing wire of above 13 SWG.

5.3 Fluctuation In Voltage And Frequency:

For continuous operation entire equipment shall be subjected to variation of voltage up to *+20% & -30%* of rated voltage and frequency of +/- 5% of rated frequency.

5.4 Instrument Transformers (CT &PT):

a. The voltage and current transformers shall have normal continuous rating as per the schedule of requirement.

b. The voltage transformer shall be so designed that the increased magnetizing currents due to any persisting over voltage, does not produce injurious overheating. **Phase barriers shall be provided**.

c. The peak value of the rated dynamic current shall not be less than 2.5 times the rated short time thermal current unless stated otherwise. (6.6.2 of ISS : 2705/Part-I of 1992, latest version).

d. **Modified Polyester Enamel Copper Wire** is to be used for winding and it shall conform to IS-4800/ Part-V (latest version).

e. The terminals of the Instrument Transformer shall be clearly marked by distinctive letters as stated in Annex 'C' of IS : 3156/ Part I/ 1992 (latest version) for voltage transformer and Annex "C" of IS-2705/ Part.I/ 1992 (latest version) for current transformers.

f. The winding shall be neatly laid and anchored.

g. The metering set tank and other metal parts shall be galvanized both inside & outside as per latest IS applicable.

5.5 Incoming side:

5.5.1 Terminals:-

a) Brass rods 12 mm dia up to 20A & 16mm dia >20A for Primary and 6 mm dia for secondary. The lugs shall be properly crimped & brazed.

Bushing for outgoing side of CT/PT set:-

b) The porcelain portion of HT bushings shall be of standard make and conform to IS-2099/1986.

c) The dimensions of the bushings shall conform to IS: 3347/ Part.III/ 1972. The minimum phase-to-phase clearance shall be as per IS/GTP.

d) The bushings shall be of reputed manufacturers which are having complete testing facilities. It should be ISI marked.

e) The bushing stems shall be provided with suitable bimetallic connectors so as to connect the jumper without disturbing the bushing stem. The bush rod stem length should be at least 40 mm and 3 nuts with 2 flat washers of brass material should be provided with each bush rod.

5.6 **Steel Tank:**

a) The oil filled container incorporating the voltage transformers and current transformers should be fitted with incoming and outgoing primary terminals and secondary terminal box. The secondary terminal box shall be arranged on sides. The general arrangement drawing with 3 bushing on the incoming side and 3 bushings on the outgoing side shall be submitted along with tender. Adequate level of oil shall be maintained in the tank for proper cooling & curb flashover.

b) The tank shall be built with a plate of 5 mm thick top and 3.15 mm sides and bottom and with all fittings shall be capable of withstanding without leakage or distortion at the standard test pressure. All joints of the tank and fittings shall be hot oil tight and no leakage should occur during service. Both side of the joint should have continuous welding.

c) It shall be provided with an oil gauge. The oil gauge glass shall be fixed to the side of the raised wall of the inspection box.

d) The tank shall be provided with necessary lifting lugs. Tank including top cover and secondary chamber shall be hot dip Galvanized.

e) The secondary terminal box cover, tank cover and other vertical joints where gaskets are used may be suitably bent at least **25 mm** bent with necessary sealing arrangement **with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart**. This is to safeguard against seepage of water into tank in case of damaged gasket. Eye holes shall be made in all bolts used in the tank, inspection chamber, secondary chamber, fixing of bushings for sealing.

f) The **6 mm** gaskets shall be dovetailed without joints to prevent moisture entry. In case of dovetailed joint, they shall not be more than two. The gaskets shall be of good quality **Neoprene** or **superior quality rubberized gasket**.

5.7 **Earthing:-**

Two earthing terminals shall be adequate size protected against corrosion and metallically clean and identified by means of the sign marked in a legible and indelible manner on or adjacent to the terminals.

a) All bolts should be provided with 2 flat washers and a spring washer with a nut.

b) Conservator should not be provided for these CTPT sets.

c) The Secondary terminal box incoming hole should be 32 mm diameter and at a suitable height from bottom to avoid replacement/ modification of secondary wires pipe when CTPT set is replaced. The secondary terminals size should be 6 mm diameter, 25 mm stem length,

2 flat washers with 3 nuts of brass material should be provided. The terminals should be provided at least 70 mm height from incoming hole and clearances shall be as per IS to avoid shorting terminals due to secondary wires pipe.

d) Secondary chamber shall have double door (inner & outer) with suitable arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door shall be provided with suitable handle/knob.

5.8 Mounting Arrangement:

The under base of all CTPT sets shall be provided with two 75 x 40 mm GI channels and foundation dimensions shall be suitable placing with tank base uniform for all sets with only +/- 2 mm tolerance, to avoid modification of structure/ plinth, whenever CTPT set is replaced.

5.9 Oil:

The insulation oil used in the tank shall comply with the requirements specified in relevant IS: 335/ 93 (latest revision) and Annexure-II.

5.10 Guaranteed Technical Particulars:

The Technical Particulars as specified in IS shall be guaranteed. Each bidder should furnish the particulars required and guarantee the values so furnished for the supplies in Annexure -I.

6.0 NAME PLATE AND MARKING:

The following additional details shall be embossed / punched / casted/ laser printed on a metallic plate with at least 10 mm letter size and the name plate shall be of non-detachable type & fixed with rivets (not with bolts &nuts).The respective sides shall be painted " INCOMING, OUTGOING, Sl. No., CT Ratio, R, Y, B" with suitable font readable from 30feets.

a) Make- Name of Manufacturer

b) Ratio (CT & PT)/ Frequency(CT&PT)

c) Rated Output and corresponding Accuracy Class (CT &PT)

d) Highest System Voltage, Insulation Level & Short time Thermal Current (CT&PT)

e) Rated voltage factor & corresponding rated time

f) Number of phases & method of connection (connection diagram)

g) Earthed / Unearthed

h) Reference standard

i) Serial No. & Type Designation

j) Month & Year of Manufacturing

k) Guarantee- 66months

l) Purchase Order No. and Date.

m)Property of TPNODL/TPSODL/TPCODL/TPWODL.

7.0 TESTS:

7.1 ROUTINE, ACCEPTANCE AND TYPE TESTS:

The following shall constitute the routine tests, acceptance tests and type test.

Stage Inspection (for both CT & PT) : The manufacturer should have the facility to show the stage inspection i.e during the period of FAT. 1 No's sample will be completely destroyed in the Bidder's laboratory in order to check the quality of resin, measurement of core weight, quality of copper used for winding and HV test will be applied for minimum 5 min to check the insulation level and the cost for the testing will be beared by the manufacturer.

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

8. TYPE TEST CERTIFICATE:-

a) The equipment offered shall be fully type tested from Govt. approved laboratory such as CPRI/ ERDA / ERTL accredited laboratory by the bidder as per the relevant standards.

b) The bidder shall furnish copies of Type Test Reports with the bid for the offered material.

c) The bidders also furnish type test certificates for bushings and oil along with the bid. **The type test certificates shall be not older than 5 years from the date of opening of bid.**

- **Type Tests For CTs (as per IS-2705:1992Part-1) :**
  - Verification of terminal marking and polarity
  - Short time current Test.
  - Temperature rise test.
  - Lightning Impulse Test.
  - High Voltage Power frequency wet withstand voltage test.
  - Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.

- **Type Tests For PTs (as per IS-3156:1992Part-1):**

- Verification of terminal marking and polarity
- Temperature rise test.
- Lightning Impulse test
- High voltage Power frequency wet withstand voltage test.
- Determination of errors according to the requirements of appropriate accuracy class.

➢ **Type Tests For Transformer Bushings (as per IS2099/1986) :**

- Wet power frequency voltage with stand test.
- Dry lightning impulse voltage with stand test.
- Temperature rise test.
- Thermal short time current withstand test.
- Cantilever load withstand test.

➢ **Acceptance and Routine Tests:-**

The following shall be conducted at factory premises for acceptance of material.

- Verification of Terminal marking and polarity.
- Power frequency/ dry withstand tests on primary windings.
- Power frequency dry withstand tests on secondary windings.
- Determination of errors according to the requirements of the appropriate accuracy class.
- Temperature rise Test

1. **Air pressure test on empty tank of transformer opened for physical verification test (One per each lot offered during pre-dispatch inspection) .**

➢ Immediately after finalization of the program for testing, the manufacturer shall give advance intimation (minimum of two weeks in advance) to the purchaser, to enable him to depute his representative for witnessing the tests where the equipment is ready for testing and inspection.

➢ All acceptance and routine tests as stipulated in the relevant standards for CTs & PTs shall be carried out by the supplier in presence of purchaser's representatives.

9. PRE-DISPATCH INSPECTION:

Equipment shall be subject to inspection by a duly authorized representative of the TPNODL/TPCODL/TPWODL/TPSODL. 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 is liable to rejection. Supplier shall grant free access to the places of manufacture to TPNODL/TPCODL/TPWODL/TPSODL's representatives at all times when the work is in progress. Inspection by the TPNODL/TPCODL/TPWODL/TPSODL or it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.

Tolerance: Unless otherwise specified herein the test value of the transformers supplied should be within the tolerance limit permitted in the IS on the guarantee values.

Inspection & Testing of MUs:-

a) The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the TPNODL/TPSODL/TPCODL/TPWODL will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to TPNODL/TPSODL/TPCODL/TPWODL and carry out the tests in the presence of representative of the TPNODL/TPSODL/TPCODL/TPWODL. At the time of factory inspection a random sample of 20 nos or 20% of the offered quantity which is more will be tested and firm will submit routine test report of all metering units basing upon which dispatch instruction will be issued. TPNODL/TPSODL/TPCODL/TPWODL may if deemed fit, can waive off the inspection of material subject to testing of material on receipt in TPNODL/TPSODL/TPCODL/TPWODL store in presence of vendor representative.

b) TPNODL/TPSODL/TPCODL/TPWODL may at its option get the materials inspected by the third party if it feels necessary.

c) The dispatches should be done after Material Dispatch Clearance Certificate (MDCC)is issued by TPNODL/TPSODL/TPCODL/TPWODL based inspection by the TPNODL/TPSODL/TPCODL/TPWODL Officer or if such inspection is waived by the competent authority.

d) The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

e) The supplier will give 15days advance intimation to enable the Purchaser depute its representative for witnessing the acceptance and routine tests.

f) Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

g) After delivery of materials at TPNODL/TPSODL/TPCODL/TPWODL Store 100% ordered materials may be collected & tested at purchaser own laboratory before

acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier.

Inspection and Testing Of Transformer Oil:

To ascertain the quality of transformer oil the manufacturer's test report should be submitted at the time of inspection. Arrangements should also be made for testing the transformer oil, after taking out the samples from the manufactured CTPT sets and tested in the presence of TPNODL/TPSODL/TPCODL/TPWODL representative (or) if desired, in an independent laboratory.

Sealing of MU(s) After Testing and Individual Test Reports:

a) After witnessing physical inspection of all offered MUs and testing of random sample of 20 nos or 20% of the offered quantity which ever is more, the purchaser's representative will seal all offered MUs with numbered plastic seals at TWO opposite corners of tank and Secondary Chamber, for delivery of correct inspected materials only.

b) The manufacturer has to provide test report duly mentioning all test results, seals numbers and Name & Designation of purchaser's representative after inspection is over. The seals number shall also be mentioned in the test reports signed by purchaser's representative submitted for delivery instructions.

10. INSPECTION AFTER RECEIPT AT STORE:

The material received at TPNODL/TPCODL/TPWODL/TPSODL Store will be inspected for acceptance and shall be liable for rejection if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Plant Engineering department.

11. GUARANTEE:

The supplier shall give Guarantee for the satisfactory functioning of the material / equipment as per specification, for a minimum period of 60 months from date of commissioning or **66 months from the last date of receipt of material in good condition at departmental store for each consignment whichever is earlier**. The bidder shall be liable to undertake the replacement or rectify defects at his own cost within mutually agreed timeframe. The bidder shall further be responsible for free

replacement for another period of three years from the end of guarantee period for any “latent defect” if noticed and reported to purchaser.

The supplier shall mention the source of all materials. He shall also mention the name of the supplier for conductor, Transformer oil, Electrical Steel Laminations, Construction Steel etc.

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. The packing should be in such manner that during storage & handling its components should not be damaged.

13. TENDER SAMPLES:

One numbers sample should be ready at the firms’ works after issue of LOA for new entrant.

The sample shall be checked for its suitability and conformity with this specification. The drawing of sample must be attached with bid documents showing all views of equipment installed inside the metering panel along with the sketch of sealing arrangement as mentioned above. After placing of purchase order the material shall be supplied as per the approved sample and specification. However, approval of the sample shall not absolve the supplier of his responsibility to supply the material as per specifications.

14. TRAINING: Not Required.

15. QUALITY CONTROL:

The bidder shall submit with the offer, 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 or its nominated representative engineer shall have free access to the manufacturer/sub-supplier's works to carry out inspections.

16. MINIMUM TESTING FACILITY:

The manufacturer should have all the testing facilities at their works to carry out all the routine & acceptance tests including partial discharge test as mentioned below. List of plant & machinery and test equipment’s available at manufacturer’s works should necessarily be submitted along with bid documents.

16.1. CALIBRATION:

All instruments used in inspection and testing should be properly calibrated and sealed from any Govt. Test House/ Reputed Agency certifications when demanded by inspecting officers

shall be provided/ produced for verification purpose

17. MANUFACTURING ACTIVITIES:

The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage with quantity. This bar chart shall be in line with the Quality Assurance Plan, submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.

18. SPARE, ACCESSORIES AND TOOLS:

Fittings:

The following standard fittings shall be provided with the Metering Units.

Sl No	Particulars	Quantity
1	Rating and terminal marking plates non detachable	1No.
2	Earthing terminals with bolt, nuts & washers for connecting earth wire	2Nos
3	**Lifting lugs**	
a)	for main tank	4Nos
b)	for top cover	2Nos
4	Pressure relief valve with metallic cap	1 No
5	Bimetallic terminal connectors on the HV bushings	6 Nos
6	HV bushings Outdoor	6 Nos
7	Secondary terminals bushings	as per requirement of CT ratio
8	Base Channel	2Nos

19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPNODL/TPCODL/TPWODL/TPSODL specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled in Technical Particulars
b) Any deviation sheet or No deviation
c) General description of the equipment and all components including brochures.
d) General arrangement drawing in enclosure
e) Experience List
f) All set of Type test certificates for offered design each variant.

Drawings / documents to be submitted for approval after the award of the contract are as under:

Sl. No	Description	For Approval	For Review/ Information	Final Submission
1.	General Technical Particulars (GTP)	√		√
2.	General Arrangement drawings	√		√
3.	Bill of materials	√		√

All the documents & drawings shall be in English language.

After the receipt of the order, the successful bidder will be required to furnish all detailed drawings of components for TPNODL/TPCODL/TPWODL/TPSODL approval.

Two sets of drawings showing clearly the general arrangements, sectional views, fitting details, electrical connections, foundation details, overall dimensions (length, breadth & height) and design features of each component/part should accompany the tender. The bidder has to submit clear & detail drawing with description how he will arrange the double door system in secondary chamber with sealing. Technical leaflets giving the operating instructions should also be furnished along with tender. **Tenders without details are liable to be rejected.**

20. GUARANTED TECHNICAL PARAMETERS:

For Supply of 11KV, 3P4W, 0.2s accuracy class CT & 0.2 accuracy class PT, CTPT Combined, Oil Cooled Metering Units

Sl. No	Particulars	Requirement	Bidder's offer
1	Manufacturer's Name & Address	To be indicated	
2	Manufacturer's Type & Design	To be indicated	
3	Type of cooling	To be indicated	
4	Nominal System Voltage	11 KV	
5	Highest System Voltage	12 KV	
6	Frequency.	50 HZ	
7	**Specification of CT & PT of Metering Unit**		
(A)	**Current Transformer**		
i	Type	Oil immersed	
ii	Accuracy Class	0.2s	
iii	Rated output	15 VA	
iv	Insulation level	28 KV_{rms}/ 75 KV_{pk}	

v	Short time thermal current rating for 1 sec	18.4 KA for 1sec.	
vi	Saturation factor	To be indicated	
vii	Normal current density of primary winding	≤1.6 Amps per Sq.mm	
Viii	Knee Point Voltage	To be indicated	
ix	Continuous percentage over load	120%	
x	ISF	As per IS	
(B)	**Potential Transformer**		
i	Type	Oil immersed	
ii	PT ratio	11KV/√3/ 110V/ √3	
iii	Rated output VA/phase	50VA	
iv	Class of accuracy	0.2	
v	Insulation level	28 KV_{rms}/ 75 KV_{pk}	
vi	Winding connection	Star/Star	
vii	Rated voltage factor & duration	To be indicated	
8	**Details of Metering Unit**		
(A)	**Current Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(b)	**Potential Transformer**		
I	**Weight of core and winding**		
i	Core	To be indicated in a separate sheet for each rating	
ii	Primary winding		
iii	Secondary winding		
II	**Resistance of winding per phase at 75° C**		
i	Primary		

ii	Secondary	To be indicated in a separate sheet for each rating	
III	**Cross section area of each turn of winding (in sq. mm.)**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
IV	**No. of turns**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
V	**Winding material type**		
i	Primary	To be indicated in a separate sheet for each rating	
ii	Secondary		
VI	**Core material type**	To be indicated in a separate sheet for each rating	
(C)	**MS Tank**		
I	**Construction Material**	MS Hot dip Galvanized tank	
II	Galvanization of Tank	Metering Unit tank including top cover ,secondary chamber shall be hot deep galvanized.	
III	**Tank Dimension in mm**		
i	Length	To be indicated	
ii	Breadth	To be indicated	
iii	Height	To be indicated	
IV	**Thickness**		
i	Side walls, Bottom.	3.15mm	
ii	Top	5 mm	
V	Edge bending	To be provided in the Top Cover	
VI	Standard pressure & duration that can be withstand.	To be indicated	
(D)	**Oil**		
i	Grade of oil	To be indicated	
ii	Quantity of oil in ltr	To be indicated (min 45 ltr)	
(E)	**HV Bushing**		
i	Type	To be indicated	
ii	Make	To be indicated	
iii	Creepage distance of HV bushing	300mm (Min)	
iv	Bi-metallic terminal connector	6 nos Bi-metallic terminal connector with nut, plain washer, spring washer & check nut suitable for aluminum conductor as per CT rating to be provided	
(F)	**Gasket Details**		
I	Type of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	

iii	HV bushings	To be indicated	
II	Thickness of Gasket to be used on		
i	Top cover tank	To be indicated	
ii	Secondary terminal box	To be indicated	
iii	HV bushings	To be indicated	
(G)	**Studs Details**		
I	Primary Stud		
i	Material	To be indicated	
ii	Size	M12 upto 20A & M16 > 20A	
II	Secondary Stud		
i	Material	To be indicated	
ii	Size	M6	
III	Gap between I/C & O/G Studs of same phase	Minimum 15º angle with the vertical axis to maintain a good distance at stud levels.	
IV	All bolts, nuts, washers in contact with non-ferrous parts shall be of brass. All other parts including bolts & nuts liable to corrosion, forming integral part of the equipment shall be SS.		
(H)	**Identification/ Marking**		
I	Primary terminals		
i	Incoming	RM, YM, BM	
ii	Outgoing	RL, YL, BL	
(I)	Secondary terminals		
i	CT marking	RS1- RS2-RS3, YS1-YS2-YS3, BS1-BS2-BS3	
ii	PT marking	R, Y, B, N	
(J)	**Clearance**		
I	Minimum phase to phase distance	255mm	
Ii	Shortest distance between metal part & earth	190mm	
9	Total weight of complete MU including all accessories and oil	To be indicated	
10	Maximum attainable winding temperature	80° C	
		Secondary chamber shall have double door (inner & outer) with suitable	

	11	Double door type Secondary Chamber & sealing arrangement	Arrangement for sealing of both the doors. The inner door shall be of transparent polycarbonate so that secondary terminal connections can be viewed without breaking the inner door seals. The inner door of the secondary chamber should be of hinge type with suitable handle/knob& sealing arrangement.	
	12	Name Plate	As per tender requirement.	
	13	Sealing arrangements	The secondary terminal box cover, tank cover sealing arrangements have to be done with sealing bolts at all corners and bolts should be at least 10 mm diameter GI bolts spaced maximum 70 mm apart. Sealing holes also to be provided in the bolts fitted with bushing & body for sealing, so that one can not open the bushing with out breaking seals. Eye holes shall be made in all bolts used in the tank, secondary chamber, fixing of bushings for sealing.	
	14	**Fittings**	As per tender clause 23.0	
	15	**Packing**	Individual Metering Unit shall be packed in wooden crate box(cage type) with the MU fitted with the base to avoid damage during transportation.	
	16	**Equi potential link**	2 nos of diagonally Cupper Strip i.e equ potential link to be provided between top cover and bottom cover of the MU.	

ANNEXURE – II

GUARANTEE TECHNICAL PARTICULARS

For Oil to be used in 11KV Metering Units

Sl. No.	Characteristic.	Particulars.	Bidder's offer
1.	Appearance.	The oil shall be clear and transparent and free from suspended matter or sediments and should conform to IS-335/93 or latest versions.	
2.	Density at 27 degrees C (max)	0.89 g/cm.	
3.	Kinematic Viscosity at 27 degrees C (max)	27 CST.	

4.	Interfacial Tension at 27 Degrees C (max)	0.04 N/M.	
5.	Flash point, pensky – marten (closed) (min)	140 Degrees C.	
6.	Pour point (max)	-10 Degrees C.	
7.	Neutralization Value : a) Total acidity(max) b) In-organic acidity alkalinity.	0.01. Nil	
8.	Corrosive sulphur.	Non-corrosive.	
9.	Electric Strength (breakdown voltage/ minute) a) New unfiltered oil. b) After filtration.	30 KV(rms) 50 KV(rms)	
10.	Dielectric dissipation factor (Tan delta at 90 Deg. C (min)).	0.005.	
11.	Specific resistance (Resistivity). a) At 90 Deg. C(min) b) At 27 Deg. C(min)	$30x10^{12}$ ohms- cm. $500x10^{12}$ ohms-cm	
12.	Oxidation stability a) Neutralization value after oxidation(max) b) Total sludge after oxidation(max)	0.5 mg KOH/g 0.05% by Weight.	
13.	Ageing characteristics after accelerating ageing (open breaker method with copper catalyst) for 96 Hrs. (as per ASTM D. 1934-1978)		
a	Specific resistance (Resistivity)		
	At 27 Deg. C (min)	2.5×10^{12} ohms-cm	
	At 90 Deg. C (min)	0.50×10^{12} ohms-cm	
b	Dielectric dissipation factor Tan delta at 90 Deg. C (max)	0.50	
c	Total sludge value (max)	0.5	
d	Total acidity (max)	0.5	
14.	Presence of oxidation inhibitor.	Nil	
15.	Water content (max)	50 ppm	

21. 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:

S. No	Clause No.	Details of deviation with justifications

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

Seal of the Company:

Signature

Designation

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CLAUSE NO.	**DESCRIPTION**

1.0 ORGANIZATIONAL VALUES

The Tata Group has always been a value driven organization. These values continue to direct the Group's growth and businesses. The six core Tata Values underpinning the way we do business are:

Integrity - We must conduct our business fairly, with honesty and transparency. Everything we do must stand the test of public scrutiny.

Understanding - We must be caring, respectful, compassionate and humanitarian towards our colleagues and customers around the world and always work for the benefit of India.

Excellence - We must constantly strive to achieve the highest possible standards in our day to day work and in the quality of goods and services we provide.

Unity - We must work cohesively with our colleagues across the group and with our customers and partners around the world to build strong relationships based on tolerance, understanding and mutual co-operation.

Responsibility - We must continue to be responsible and sensitive to the countries, communities and environments in which we work, always ensuring that what comes from the people goes back to the people many times over.

Agility - We must work in a speedy and responsive manner and be proactive and innovative in our approach.

2.0 ETHICS

In our effort towards Excellence and in Management of Business Ethics at TPCODL, an Ethics Management Team is constituted.

The main objective of the Ethics Management Team is to:

1. Record, address and allay the issues and concerns on ethics raised by different stakeholders like employees, consumers, vendors, Associates etc. by initiating immediate corrective actions.
2. Ensure proper communication of the ethics policies and guidelines through prominent displays at all offices of TPCODL and through printed declarations in all concerned documents where external stakeholders are involved.
3. Ensure proper framework of policies as preventive measures against any ethics violation recorded by them.
4. Prepare and submit MIS of all issues and concerns, corrective and preventive actions on monthly basis to the top management for their information.

All Associates and Stakeholders are requested to register any grievance on ethics violation on our website www.tpcentralodisha.com.

3.0 CONTRACT PARAMETERS

3.1 Issue/Award of Contract

TPCODL awards the contract to the Associate in writing in the form of Purchase Order (PO) or Rate Contract (RC), hereafter referred as Contract, through in any or all of following modes physical handover / post / e-mail / web document / fax with all the attachments/enclosures which shall be part of the contract document.

On receipt of the contract, the associate shall return to TPCODL copy of the contract document duly signed by legally authorized representative of associate, within two days of Effective Date of Contract for contracts having contract execution time less than 30 days and within five days for all other contracts.

3.2 Contract Commencement Date

The date of issue/award of contract shall be the Effective Date of Contract or Contract Commencement date.

3.3 Contract Completion Date

The date of expiry of Guarantee Period shall be deemed as the Contract Completion Date.

3.4 Contract Period/Time

The period from Contract Commencement Date to Contract Completion Date shall be deemed as the Contract Period/Time.

3.5 Contract Execution Completion Date

The stipulated date for completing the supply as per schedule of quantities shall be deemed as the Contract Execution Completion Date.

3.6 Contract Price /Value

The total all inclusive price/value mentioned in the PO/RC is the Contract Price/Value and is based on the quantity, unit rates and prices quoted and awarded and shall be subject to adjustment based on actual quantities supplied and accepted and certified by the authorized representative of the company unless otherwise specified in schedule of quantities or in contract documents.

3.7 Contract Document

The Contract Document shall mean and include but not limited to the following:

- NIT/Tender Enquiry, QR, Instruction to Bidders, Special Condition of Contract (SCC) of tender, GCC, Technical & Commercial Specifications including relevant annexure and attachments).
- Bids & Proposals Received from Associate including relevant annexure/attachments.
- RC/PO with agreed deviations from the tender/bid documents.
- All the Inspection and Test reports, Detailed Engineering Drawings.
- Material Dispatch Clearance Certificate (MDCC).
- Minutes of Meeting (MoM)

3.8 Contract Language

All documents, instructions, catalogues, brochures, pamphlets, design data, norms and calculations, drawings, operation, maintenance and safety manuals, reports, labels, on deliveries and any other data shall be in English Language.

The Contract documents and all correspondence between the TPCODL, Third Parties associated with the contract, and the Associate shall be in English language.
However, all signboards required indicating "Danger" and/or security at site and otherwise statutory required shall be in English, Hindi, and local languages.

3.9 Reverse Auction

TPCODL reserves the right to conduct the reverse auction (instead of public opening of price bids) for the products / services being asked for in the tender. The terms and conditions for such reverse auction events shall be as per the Acceptance Form attached in Annexure F.

4.0 SCOPE OF WORK

All the activities that are to be undertaken by the Associate to realize the contractual deliverables in completeness form Scope of Work. Following clauses list, but not limited to, major requirements of the scope of work.

The associate shall satisfy himself and undertake fully the technical/commercial requirements of items to be supplied as listed in the Schedule of Quantities together with the tests to be performed /test reports to be furnished before dispatch, arrangement of stage and final inspections during manufacturing as per terms and conditions of contract, technical parameters & delivery terms and conditions including transit insurance to be met in order to fully meet TPCODL's requirements.

Completeness: Any supplies and services which might have not been specifically mentioned in the Contract but are necessary for the scope mentioned in Special Terms & Conditions and/or completeness of the works at the highest possible level, including any royalties, license fees & compensation to be paid, whether incurred by the associates or by a third party for the work covered in the scope, regardless of when incurred, shall be supplied/provided by the associate without any extra cost and within the time schedule for efficient , smooth and satisfactory operation and maintenance of the works at the highest possible level under Indian conditions (but according to international standards for facility of this type), unless expressly excluded from the scope of supplies and services in this Contract.

TPCODL have the right, during the performance of the Contract, to change the scope and/or technical character of the Project and/or of the supplies and services stipulated in the Contract by submitting a request in writing to the Associate. The Associate shall, within fifteen days of receipt of such request from the TPCODL, provide Purchaser with a reasonably detailed estimate of the cost of the change outlined in the request.

In the event, TPCODL requests a change, the Contract price and time shall be adjusted upwards or downwards, as the case may be and shall be mutually agreed to. The associate shall not be entitled to any extension of time unless such changes adversely affect the time schedule.

The Associate shall not proceed with the changes as requested till adjustment of contract price and time schedule where so applicable in terms of or otherwise directed by the TPCODL.

5.0 PRICES/RATES/TAXES

Unless specified elsewhere in the contract document, the prices/rates are inclusive of cost of finished product for which MDCC will be issued by TPCODL, packaging and forwarding charges, freight and transit insurance charges covering loading at Associate's works, transportation to TPCODL store/site & unloading & delivery at TPCODL stores/TPCODL site, cost of documentation including all the relevant test certificates and other supportive documents to be furnished.

The Prices/Rates are inclusive of all taxes, levies, cess and duties, particularly Goods and Services Tax as applicable. All government levy / taxes shall be paid only when the invoice is submitted according to the relevant act.

The prices/rates shall remain firm till actual completion of entire supply of goods/material/equipment as per contract is achieved and shall remain valid till the completion of the contract.

The prices shall remain unchanged irrespective of TPCODL making changes in quantum in all or any of the schedules of items of contract.

5.1 Changes in Statutory Tax Structure

If rate of any or all of the statutory taxes and duties applicable to the contract changes, such changes shall be incorporated by default if the changes occur within the contract execution time and shall be applicable if the contract is executed by the Associate within the Contract Execution Time.

For execution of contracts beyond contract execution time, where the delay is not attributable to TPCODL no upward revision in tax /duties shall be considered irrespective of changes in the statutory tax structure either within the contract execution time or beyond. However, in such cases, benefits due to any downward revisions in statutory tax rates shall be passed on to TPCODL.

6.0 TERMS OF PAYMENT

On delivery of the materials in good condition and certification of acceptance by TPCODL official, Associate shall submit the Bills/Invoices in original in the name of “TP Central Odisha Distribution Limited” to invoice desk, complete with all required documents as under:

- Test Reports (4 sets).
- MDCC issued by TPCODL.
- Packing List.
- Drawing and Catalogue.
- Guarantee/Warrantee Card.
- Delivery Challan.
- O&M Manual.
- Copy of Order.
- Minutes of Meeting.

Bills/ invoices shall mention Supplier’s GST Number. TPCODL will make 100% payment within 30 days of submission of the Bill/Invoice complete in all respects and along with all the requisite documents mentioned above, subject to condition that Associate has furnished the requisite Security-cum-Performance Guarantee as stipulated in the contract.

6.1 Quantity Variation

Payment will be made on the basis of actual quantity of supplies/actual measurement of works accepted by TPCODL and not on the basis of contract quantity.

6.2 Full and Final Payment

Full & Final Payment in all contracts shall be made subject to the associate submitting "No Demand Certificate" in the format as per Annexure-C.

7.0 MODE OF PAYMENT

Payment shall be made through crossed Cheque or RTGS whichever of the two modes chosen by the Associate, in favour of Associate's Bank Account on TPCODL records, on whose name Contract has been issued. Those Associates opting for the RTGS mode shall submit the details of Bank Account and other details as per annexure G. Further, for any payments made, TPCODL is not responsible for any consequences/disputes Associate have among the owners channel partners, sub-Associates and all such dispute/concerns shall be settled solely by the Associate.

8.0 SECURITY CUM PERFORMANCE DEPOSIT

Associates shall submit within 15 days from the effective date of issue of PO/RC, Security Performance Bank Guarantee (SPBG) in the format as per Annexure B of this document from banks acceptable to TPCODL for:

(a) 5% of the PO value if purchase order value is more than Rs 5 Crores.

(b) 10% of the PO value if purchase order value is less than Rs 5 Crores.

This shall remain valid till the end of the Guarantee Period of contract, plus one month.

(c) 5% of the RC value in case of Rate Contract. This shall remain valid till the Guarantee period plus one month.

- For PO/RC values less than Rs. 5 lacs, Associate may request for deduction of amount equivalent to SPBG value from their first invoice. Such amount shall be withheld by TPCODL while processing the invoice and shall be released after completion of Guarantee Period plus one month.
- For PO/RC values less than Rs. 3 lacs, the clause (8.0) for Security cum Performance Bank Guarantee (SPBG) shall not be applicable.
- In case of RC (Rate Contract) after the expiry of RC validity, Associate shall have to submit SPBG. However, the Associate has the option to re-submit the SPBG as per actual RO (Release Order) value issued against the RC, valid for Guarantee Period plus one month. The Guarantee Period shall be considered as per the last RO issued against the said RC. The original SPBG as submitted against the RC shall be released on submission of the new SPBG to TPCODL. Alternatively, Associate may extend the validity of original SPBG only till the requisite period, i.e. Guarantee Period plus one month.

9.0 STATUTORY COMPLIANCE

9.1 Compliance to Various Acts

Associate should ensure adherence to all applicable laws, rules and regulation applicable under this contract from time to time. In case of violation any risk, costs etc shall be in associates account and keep TDPPL indemnified always till completion of contracts.

9.2 SA 8000

TPCODL expects its Associates to follow guidelines of SA 8000:2014 on the following aspects

1. Child Labour
2. Forced or Compulsory Labour
3. Health & Safety
4. Freedom of Association & Right to Collective Bargaining
5. Discrimination
6. Disciplinary Practices
7. Working Hours
8. Remuneration
9. Management System

9.3 Affirmative Action

TPCODL appreciate and welcome the engagement/employment of persons from SC/ST community or any other deprived section of society by their business associates.

Relaxation in Contract Clauses under Affirmative Action for SC/ ST Business Associates**

TPCODL believes that inclusive growth is the key to sustainable development, and to promote the same Policy on Affirmative Action for Scheduled Caste & Scheduled Tribe Communities has been adopted across the company.

Under the same pre-text, and to promote entrepreneurship among SC/ST community TPCODL has taken initiative by proposing relaxations in contract clauses as per below:

S. No	Initiative	for SC/ ST BA's	Guideline Document
1	Tender Fees	100% waiver for SC/ST community	All Open Tenders
2	Earnest Money Deposit	50 % relaxation of estimated EMD value	All limited and Open Tenders
3	Performance Bank Guarantee	50% relaxation in PBG for order value above 50 lacs else 25% relaxation	All limited and Open tenders
4	Turnover	25% relaxation in company turnover under qualifying requirement criteria	All Open Tenders

****Classification of BAs under SC/ST shall be governed under following guidelines:**

- Proprietorship/ Single Ownership Firm: Proprietor of the firm should be from SC/ST community. Governing document shall be duly audited balance Sheet for the last FY bearing the name of proprietor.
- Partnership Firm: Only such firms shall qualify which have SC/ST partners holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Partnership Deed and audited balance sheet/ ITR for last FY.
- Private limited company: Only such firms shall qualify which have SC/ST directors holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).

Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).

Note: Certification from SC/ST commission shall be required for deciding upon SC/ST status of a person.

10.0 QUALITY

10.1 Knowledge of Requirements

The Associate shall be deemed to have carefully examined and to have knowledge of the equipment, the general and other conditions, specifications, schedules, drawings, etc. forming part of the Contract and also to have satisfied himself as to the nature and character of the work to be executed and the type of the equipment and duties required including wherever necessary of the site conditions and relevant matters and details. Any information thus procured or otherwise obtained from TPCODL/Consultants shall not in any way relieve the Associate from his responsibility and executing the works in accordance with the terms of contract.

10.2 Material/Equipment/Works Quality

The items / works under the scope of the Associate shall be of the best quality and workmanship according to the latest engineering practice and shall be manufactured from materials of best quality considering strength and durability for their best performance and, in any case, in accordance with the specifications set forth in this Contract. All material shall be new. Substitution of specified material or variation from the process of fabrication/ construction/ manufacture may be permitted but only with the prior written approval of the TPCODL.

10.3 Adherence to Rules & Regulations

The Associate shall procure and/or fabricate/erect all materials and equipment in accordance with all requirements of Central and State enactment, rules and regulations governing such work in India and at site. This shall not be construed as relieving the Associate from complying with any requirement of TPCODL as enumerated in the Contract which may be more rigid than and not contrary to the above mentioned rules, nor providing such construction as may be required by the above mentioned rules and regulations. In case of variance of the Technical Specification from the laws, ordinance, rules and regulations governing the work, the Associate shall immediately notify the same to the TPCODL. It is the sole responsibility of the Associate, however, to determine that such variance exists. Wherever required by rules and regulations, the Associate shall also obtain the statutory authorities' approval for the plant, machinery and equipment to be supplied by the Associate.

10.4 Specifications and Standards

The Associate shall follow all codes and standards referred in the Contract Document. Codes and standards of other may be followed by the Associate with the prior written approval of TPCODL, provided materials, supplies and equipment according to the standard are equal to or better than the corresponding standards specified in the Contract.

Brand names mentioned in the Contract documents are for the purpose of establishing the type and quality of products to be used. The Associate shall not change the brand name and qualities of the bought out items without the prior written approval of the TPCODL. All such products and equipment shall be used or installed in strict accordance with original manufacturer's recommendations, unless otherwise directed by the TPCODL. In any circumstances the codes, specimen and standards prescribed by any government agency should not be violated.

11.0 INSPECTION/PARTICIPATION

11.1 Right to Carry Out Inspection

TPCODL reserves the right to send its representatives for inspection or participation at various stages of contract execution listed below, applicable as per contract construction.

- During basic design and detail engineering of material/ Equipment carried out by Associate /Outsourced Agencies.
- During manufacturing stages of the product at Associate's/Associate's Outsourced Agency's Plant/Facility.
- During Pre-dispatch Inspection and Testing of finished/manufactured product at Associate's/Associate's outsourced Agency's Plant/Facility.
- During Installation & Commissioning Activities/Stages.
- Prior to Clearing of the completed installation for commissioning.
- Any other stage as find appropriate by TPCODL during contract execution time.

All inspections and participations shall be carried out by TPCODL giving written intimation to the Associate or receiving appropriate advance written inspection call from the Associate, unless otherwise specified elsewhere in the contract document.

11.2 Facilitating Inspection

The Associate shall provide all opportunities and information to TPCODL's engineers to get acquainted with the technical know-how and the methods and practices adopted by the Associate in basic and detail engineering. The Associate shall provide documents, drawings, calculations etc. as may be required by TPCODL's Engineers.

The Associate shall provide free of charge office accommodation, office facilities, secretarial services, communication facilities, general and drawing office stationary, etc. as may be reasonably required by the TPCODL's engineers. Similarly, facilities shall also be provided by Associate's outsource agencies/partners/authorized dealers (collectively termed as sub associates) if such basic and detail engineering activities are carried out in the design offices of sub-Associates.

The Associate shall be responsible for the safety of employees of TPCODL/Third Party Agency when they are at the Associate's /Associate's outsource agency's plant or facility for carrying out/witnessing inspection/testing. All statutory safety precautions as applicable shall be followed by the Associate during Inspection Testing. If TPCODL inspectors are not satisfied with the safety arrangements at the plant, TPCODL have the right to call off inspection till such time corrective action is taken by the Associate.
Before raising the call for pre-dispatch final inspection and testing, the Associate shall conduct all the tests—type tests, routine tests etc-as specified in the contract document and submit copies of the test certificates to TPCODL along with the inspection call, for scrutiny of TPCODL.

The Associate and TPCODL shall jointly document all the observations, comments and action points after completion of inspection and it shall be binding on the Associate to provide compliance on all the points requiring compliance and furnish the compliance report to the designated authority of TPCODL for receiving clearance for dispatch of materials

11.3 Third Party Nomination

TPCODL also may nominate a third party for the purpose of carrying out the inspection and such an agency shall be entitled to all the rights and privileges of TPCODL as far as conducting the inspection.

11.4 Waiver of Inspections

TPCODL on its own discretion shall chose to waive off any inspection and ask the Associate to submit all the test reports as applicable as per contract specifications, related to inspection and testing of the goods ordered for scrutiny and clearance for dispatch.

11.5 Incorrect Inspection Call

In case it is observed that the material offered for inspection is not ready at the time of TPCODL inspection visit rendering it as futile, all costs towards such inspection shall be recovered from the BA. Taxes as applicable on such recoveries shall be borne by the BA.

12.0 MDCC & DELIVERY OF MATERIALS

12.1 Material Dispatch Clearance Certificate

Associate shall deliver material/goods/equipment against Supply Contracts or Supply Part of Composite/Service Contracts only after receiving Material Dispatch Clearance Certificate (hereafter termed as MDCC) issued by designated authority of TPCODL. Material delivered at TPCODL stores or at project site without a valid MDCC issued by the designated official of TPCODL shall be rejected. MDCC shall be issued to associate furnishing compliance report on the action points documented during pre-dispatch inspection and testing at Associate's/ Sub Associate's plant/ facility. In case Pre-dispatch inspection is waived at the discretion of TPCODL, then, MDCC shall be issued on receiving all the test reports-routine& type-from the Associate and finding them in order.

The associate shall include and provide for securely protecting and packing the materials so as to avoid loss or damage during handling and transport by air, sea, rail and road or any other means.

All such packing shall allow to the extent possible for easy removal and checking at Site. The associate shall take special precautions to prevent rusting of steel and iron parts during transit by sea. Gas seals or other materials shall be utilized by the associate for protection against moisture during transit of all Plant and Equipment.

Each Equipment or parts of Equipment shall be tagged with reference to the assembly drawings and corresponding part numbers. Each bale or package shall contain a packing note quoting specifically the name of the associate, item description, quantity, item / package identification.

All packing cases, containers, packing and other similar materials shall be new and supplied free by the associate and it shall not be required to be returned to the associate.
Notwithstanding anything stated in this clause, the associate shall be entirely responsible for loss, damage or depreciation or deterioration to the materials and supplies due to faulty and/or insecure packing or otherwise during transportation to the Site until otherwise provided herein.

In case of the consignments dispatched by road, the associate shall ensure that it or its subcontractors:

i) Identify and obtain the correct type of trucks/trailers, keeping in view the nature of consignments to be dispatched.

ii) Take such actions as may be necessary to avoid all possible chances of damages during transit and to ensure that all packages are firmly secured.

Timelines for inspection and MDCC is as below:

S. No.	Inspection	MDCC issuance time including Inspection time (max.)
1	Outside Bhubaneswar	12 days
2	Within Bhubaneswar	5 days
3	Waiver*	3 working days

* Associate is expected to raise the inspection call assuming that Inspection shall be carried out by TPCODL. The decision for waiver of inspection shall be on sole discretion of TPCODL.

12.2 Right to Rejection on Receipt

Goods/Material/Equipment delivered in condition physically damaged & incomplete as a product ordered, or not packed and transported as per the terms and conditions of the contract is liable to be rejected. Such item shall be lifted back by Associates within 15 days from receipt of rejection note from TPCODL and have to supply back the material within next 30 days or within the timeframe mutually decided by Associate and TPCODL.

If delivery of the material is beyond the agreed time, Liquidated damage clause, mentioned in this GCC separately shall be applicable; but the period for levy of LD shall be considered as per the original delivery schedule and not from the agreed timelines for material rectification.

12.3 Consignee

Unless otherwise specified in the Contract Document, Materials/Goods/Equipment shall be consigned to “Stores-In-Charge”, TPCODL, Bhubaneswar.

12.4 Submission of mandatory documents on Delivery

Following documents shall be mandatorily submitted by BA along with supply of material to TPCODL stores/site:

S. No.	Documents	Requisite
1	Invoice copy in original	With all consignments
2	LR copy	Wherever required
3	Packing list	With all consignments
4	MDCC	With all consignments
5	Purchase order / Release order	Signed copy
6	Test certificates	With all consignments
7	Inspection/JVR report	In case pre-dispatch inspection is conducted
8	Device data in CD as per template for metering items	Wherever applicable

12.5 Dispatch and Delivery Instructions

S. No.	Instructions
1	Purchase order/ Release order no. shall be mentioned on invoice and on material

2	TPCODL material code and material description shall be mentioned in invoice and on material.
3	“Property of TPCODL” shall be embossed on material.
4	The material shall be properly sealed and packed in standard packing as per purchase order terms & conditions.
5	The weight and quantity of material shall be mentioned wherever applicable
6	The material supplied shall be co-related with the packing list.
7	The name plate detail on equipment shall include Material code, Material description, specification detail of material [as applicable], Serial No. Year of manufacturing, PO/RO no. and date, “PROPERTY OF TPCODL, Bhubaneswar”, Guarantee period and Associate’s name.
8	In case of manual unloading, supplier / transporter shall deploy sufficient Labour for unloading the material at TPCODL central store. For heavy item(s), crane will be provided by TPCODL [unloading cost will be recovered from the associate].
9	The driver should have valid License and one helper in truck. All the documents of truck like registration papers, PUC etc. should be available in Truck.
10	BA representative should accompany the material and get it unloaded / stacked in his presence wherever possible.

13.0 GUARANTEE

13.1 Guarantee of Performance

Associates shall stand guarantee that the equipment and material supplied under the contract is free from design, manufacturing, material, construction, erection & installation and workmanship & quality defects and is capable of its due, rated and intended quality performance, as an integrated product delivered under the contract, for a specific period termed as Guarantee Period(as elaborated elsewhere in this clause). The Associate should also guarantee that the equipment/material is new and unused except for the usage required for the tests and checks required as part of quality assurance.

13.2 Guarantee Period

The Guarantee Period will be equipment/service/work specific and shall be as specified in the Standard Specifications of TPCODL for the equipment/material/service/work and where standard specifications are not part of contract documents or guarantee period is not specified in the standard specifications,, the guarantee period shall be as per the Special Terms and Conditions of the Contract. In case of no mention of the guarantee period in standard specifications or SCC Guarantee Period will be 12 Months from the Date of Commissioning or 24 months from the date of delivery of final lot of supplies made, whichever is earlier.

13.3 Failure in Guarantee Period (GP)

If the equipment and material supplied under the contract fails to perform its due, rated & intended quality performance, during the Guarantee period, the associate is liable to undertake repair/rectify/replace the equipment and material supplied within time frame specified in the SCC or elsewhere in the contract documents at associate’s cost to make the equipment and material supplied/service or work rendered under the contract of performing its due, rated and intended quality performance. If Associate fails to repair/rectify/replace the equipment or material supplied rendered under the contract, failed in Guarantee Period, TPCODL will be at liberty to get the same done at Associate’s risks and costs and recover all such expenses plus the TPCODL’s own

charges (@ 20% of expenses incurred), from the Associate or from the "Security cum Performance Deposit" as the case may be.

If during the Warranty/ Guarantee period some parts of the supplies are replaced owing to the defects/ damages under the Warranty, the Warranty period for such replaced parts shall be until the expiry of twelve months from the date of such replacement or renewal or until the end of original Guarantee period, whichever is later.

Any repairs during the Guarantee Period shall be carried out by the Associate within 30 days of reporting the issue to Associate by TPCODL. However, if replacement of the Equipment is required, Associate shall notify the same to TPCODL within 7 days of reporting the issue by TPCODL. Thereafter, the total time for supply of new equipment/ material shall be equal to the original delivery period of that equipment/ material as specified in the Contract. In case the Associate is not able to rectify/ replace the faulty equipment/ material within the stipulated timelines as mentioned above, penalty shall be levied as per the Liquidated Damages clause mentioned in this document. The penalty amount shall be recovered from the payment due to the vendor or by encashment of the SPBG as the case may be.

13.4 Cost of repairs on failure in GP

The cost of repairs/rectification/replacement, required transportation, site inspection /mobilization/dismantling and re-installation costs as applicable, to be borne by Associate. The Associate has to ensure that the interruption in the usage of intended purpose of the equipment is minimized to the maximum extent In lieu of the time taken for repairs/rectification/replacement.

13.5 Guarantee period for Goods Outsourced

If the Associate outsources partly equipment/materials/services from third party as mutually agreed upon at the pre award stage of contract, TPCODL shall have the benefit of any additional guarantee period if provided by the third party for the part supplied/executed by them.

13.6 Latent Defect

Hidden defects in manufacturing or design of the product supplied and which could not be identified by the tests conducted but later manifested during operation of the equipment are termed as latent defects. Associates 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.

13.7 Support beyond the Guarantee Period

The Associate shall ensure availability of spares and necessary support for a period of atleast 10 years post completion of guarantee period of equipment supplied against the contract.

14.0 LIQUIDATED DAMAGES

a) For supplies which are of standalone use, multiple in quantities and having a single final delivery schedule, Liquidated damages shall be levied without prejudice to any of the other contractual rights of TPCODL, as described below:

   For delay of each week and part thereof from the delivery schedule specified in the contract, 1% of contract value corresponding to undelivered quantity, provided full quantity is supplied within 130% of the original contract time. If full contractual quantity is not delivered within 130% of contract time for delivery, TPCODL has the right to levy LD on the entire contract value, subject to a maximum of 10% of the total contract value.

b) For Supplies having phased delivery schedule as per contract terms, standalone use and multiple in quantities, Liquidated damages shall be levied without prejudice to any of the other contractual rights of TPCODL, as described below:

For the purpose of calculating and applying LD, each delivery lot shall be considered separately. For delay of each week and part thereof, from the delivery schedule specified for the lot, 1% of the contract value corresponding to the undelivered quantity of the lot subject to a maximum of 10% of the total contract value of the subject lot. However, if full contractual quantity is not delivered within 130% of contract time for delivery, TPCODL has the right to levy LD on the entire contract value, subject to a maximum of 10% of the total contract value. Deduction of LD shall be on landed cost i.e contract value inclusive of taxes and in pursuant statutory compliance GST would be applicable at the stipulated rate and the same shall be borne by Business Associate. In case of LD deduction, a GST invoice shall be issued by TPCODL as a proof of deduction/ recovery.

14.1 LD Waiver Request

Any request of LD waiver shall be submitted within thirty (30) days of deducting LD. Request submitted beyond the timeline shall not be entertained.

15.0 UNLAWFUL ACTIVITIES

The Associate shall have to ensure that none of its employees are engaged in any unlawful activities (whether covered under the scope of the present GCC or not) subversive of the TPCODL's interest failing which appropriate action (legal or otherwise) may be taken against the Associate by the TPCODL, in accordance with the terms of the present GCC.

16.0 CONFIDENTIALITY

Associate and its employees or representatives thereof shall strictly maintain the confidentiality of various information they come across while executing the contract as detailed below.

16.1 Documents

All maps, plans, drawings, specifications, schemes and other documents or information related to the Contract/Project and the subject matter contained therein and all other information given to the Associate by the TPCODL in connection with the performance of the contract shall be held confidential by the Associate and shall remain the property of the TPCODL and shall not be used or disclosed to third parties by the Associate for any purpose other than for which they have been supplied or prepared. The Associate may disclose to third parties, upon execution of confidentiality agreements, such part of the drawings, specifications or information if such disclosure is necessary for the performance of the Work provided such third parties agree in writing to keep such information confidential to the same extent and degree as provided herein, for the benefit of the TPCODL.

16.2 Geographical Data

Maps, layouts and photographs of the unit/plant including its surrounding regions showing vital installation for national security of country or those of TPCODL shall not be published or disclosed to the third parties or taken out of the country without prior written approval of the TPCODL and upon execution of confidentiality agreements satisfactory to the TPCODL with such third parties prior to disclosure.

16.3 Associate's Processes

Title to secret processes if any developed by the Associate on an exclusive basis and employed in the design of the equipment shall remain with the Associate. TPCODL shall hold in confidence such processes and shall not disclose such processes to the third parties without prior approval of the Associate and execution by such third parties of secrecy agreements satisfactory to the Associate prior to disclosure. Upon completion of contract, such processes shall become the property of the TPCODL. Title to technical specifications, drawings, flow sheets, norms, calculations, diagrams, interpretations of test results, schematics, layouts and such other information, which the Associate has supplied to the TPCODL under the Contract shall be passed on to the TPCODL. The TPCODL shall have the right to use these for construction, erection, start-up, Trial Run, operation, maintenance, modifications and/or expansion of the works including for the manufacture of spare parts.

16.4 Exclusions

The provision of Clauses 16.1 to 16.3 shall not apply to information:

- Which at the time of disclosure are in the public domain which later on become part of public domain through no fault of the party concerned, or
- Which were in the possession of the party concerned prior to disclosure to him by the other party, or
- Which were received by the party concerned after the time of disclosure without restriction on disclosure or use, from a third party who did not acquire such information directly or indirectly from the other party or has no obligation of confidentiality for such information.

16.5 Violation

In case of violation of this clause, the Associate is liable to pay compensation and damages as may be determined by the competent authority of TPCODL.

17.0 INTELLECTUAL PROPERTY RIGHTS

If, in the course of performance of its functions and duties as envisaged by the scope of the present GCC, the Associate acquires or develops, any unique knowledge or information which would be covered, or, is likely to be covered within the definition of a trademark, copyright, patent, business secret, geographical indication or any other form of intellectual property right, it shall be obliged, under the terms of this present GCC, to share such knowledge or information with the TPCODL. All rights, with respect to, or arising from such intellectual property, as afore mentioned, shall solely vest in TPCODL.

Moreover, the Associate undertakes not to breach any intellectual property right vesting in a third party/parties, whether by breach of statutory provision, passing off, or otherwise. In the event of any such breach, the Associate shall be wholly liable to compensate, indemnify or make good any loss suffered by such third party/parties, or any compensation/damages arising from any legal proceeding/s, or otherwise. No liability of TPCODL shall arise in this respect, and any costs, damages, expenses, compensation payable by TPCODL in this regard to a third party/parties, arising from a legal proceeding/s or otherwise, shall be recoverable from the Associate.

18.0 INDEMNITY

The Associate shall at all times indemnify, keep indemnified and hold harmless the TPCODL and its officers, directors, employees, affiliates, agents, successors and assigns against all actions, claims, demands, costs, charges and expenses arising from or incurred by reason of any

infringement of patent, trade mark, registered design, copy rights and/or industrial property rights by manufacture, sale or use of the equipment supplied by the Associate whether or not the TPCODL is held liable for by any court judgement. In this connection, the TPCODL shall pass on all claims made against him to the Associate for settlement.

The Associate assumes responsibility for and shall indemnify and save harmless the TPCODL from all liability, claims, costs, expenses, taxes and assessments including penalties, punitive damages, attorney's fees and court costs which are or may be required to be paid by the TPCODL and its officers, directors, employees, affiliates, agents, successors and assigns arising from any breach of the Associate's obligations under the Contract or for which the Associate has assumed responsibilities under the Contract including those imposed under any local or national law or laws, or in respect to all salaries, wages or other compensation for all persons employed by the Associate or his Sub-Associates or suppliers in connection with the performance of any work covered by the Contract. The Associate shall execute, deliver and shall cause his Sub-Associate and suppliers to execute and deliver, such other further instruments and to comply with all the requirements of such laws and regulation as may be necessary there under to conform and effectuate the Contract and to protect the TPCODL.

The TPCODL shall not be held responsible for any accident or damages incurred or claims arising, due to the Associate's error there from prior to completion of work. The Associate shall be liable for such accidents and after completion of work for such accidents as the case may be due to negligence on his part to carry out Work in accordance with Indian laws and regulations and the specifications set forth herein.

19.0 LIABILITY & LIMITATIONS

19.1 Liability

Except for any specific liability which may be identified in the Contract and which may be payable hereunder, Associate shall not be liable for any special, incidental, indirect, or consequential Damages or any loss of business Contracts, revenues or other financial loss (or equivalents thereof no matter how claimed, computed or characterized) arising out of or in connection with the Performance of the Work or supply of Goods ***unless caused by Associate's negligence, willful misconduct or breach of contract.***

If the Associate is a joint venture or consortium, all concerned parties shall be jointly and severally bound to the TPCODL for the fulfillment of the provisions of the Contract. The consortium or the joint venture shall designate one party as their leader, who will be the coordinator between the parties and TPCODL. The constituents & leader of the consortium or joint venture shall not be changed without the prior consent of TPCODL.

TPCODL shall have no liability or any special, incidental, indirect or consequential Damages for any loss of Business Contracts, revenues or other financial loss arising out of this Contract.

19.2 Limitation of Liability

The total liability of Associate against any contract shall be limited to the Total All Inclusive Contract Value.

20.0 FORCE MAJEURE

Force Majeure applies if the performance by either Party ("the Affected Party") of its obligations under Contract is materially and adversely affected.

"Force Majeure" shall mean any event or circumstance or combination of events or circumstances referred below and their consequences that wholly or partly prevents or unavoidably delays any

Party in the performance of its obligations under this Agreement, but only and to the extent that such events and circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided even if the Affected Party had taken reasonable care:

- Act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, embargo, blockade, revolution, riot, bombs, religious strife or civil commotion, etc. ▪ Politically motivated sabotage, or terrorism, etc.
- Action or Act of Government or Governmental agency for which remedy is beyond the control of the affected parties. ▪ Any act of God.

Note: Causes like power breakdown/ shortages/fire/strikes, accidents etc do not fall under Force Majeure.

Time being the essence of the Contract, if either party is prevented from the performance of its obligations in whole or in part due to an event of Force Majeure, then provided Notice of happening of any event by the Affected Party is given to the other party within seven (7) days from the date of occurrence of such event, which DIRECTLY has impact on works and submitted details and quantum of resulting effect, but at the same time had made all possible efforts to mitigate and overcome effects thereof, the Affected Party's performance under this Contract shall be suspended until such event ceases and the Scheduled Completion shall be delayed accordingly.

If Force Majeure event(s) continue for a period of more than three months, the parties shall hold consultation to discuss the further course of action.

Neither party shall be considered to be in default or in breach of its obligation under the Contract to the extent that performance of such obligation by either party is prevented by any circumstances of Force Majeure which arise after effective date of Contract.

Neither party can claim any compensation from the other party on account of Force Majeure.

21.0 SUSPENSION OF CONTRACT

21.1 Suspension for Convenience

TPCODL may, at any time and at its sole option, suspend execution of all or any portions of the schedule of items of contract to be supplied/work to executed by Associate under the contract by providing to the Associate atleast two business days written notice for contracts having contract completion period less than sixty days and atleast seven business days' notice for all other contracts.

Upon receipt of any such notice, the Associate shall respond as follows as applicable as per contract construction.

- Immediately discontinue further supply of material/goods specified in the suspension notice for supply contracts
- Immediately discontinue further service/work and supply of materials of those services/materials/work specified in the suspension notice for service /composite contract
- Promptly make every reasonable effort to obtain suspension, upon terms satisfactory to TPCODL, of all orders, outsourcing arrangements, and rental Contracts to the extent that they relate to performance of the portion of Work suspended by the notice.

- Protect and maintain the portion of the service/Work already completed, including the portion of the Work suspended hereunder, unless otherwise specifically stated in the notice.
- Continue delivering/carrying out the supply/service/work items as per contract conditions, which do not fall under purview of the suspension notice.

On receipt of resumption notice from TPCODL, the Associate shall resume execution of contract as specified in the resumption notice, within the time frame specified in the resumption notice.

21.2 Suspension for Breach of Contract conditions.

TPCODL shall suspend execution of whole/or part thereof the contract till such time Associate complies with the conditions stipulated under section clause 22.1 for breach/default of contract conditions.

21.3 Compensation in lieu of Suspension

If the suspension of the contract in whole or in part is for convenience of TPCODL and not due to any breach of contract conditions by the associate, TPCODL at its discretion shall consider compensating all reasonable additional costs incurred by Associate in lieu of suspension of whole or part of contract, on representation of the Associate providing justified estimates of such additional costs and such estimates are found acceptable and approved by competent authority of TPCODL.

If the suspension of contract in whole or part thereof is due to breach of contract conditions (refer clause 22.1) by the Associate, Associate shall not be entitled for any compensation for any cost incurred in lieu of suspension of whole or part of contract and also shall be liable for compensating all the losses arising to TPCODL in lieu of suspension of contract. Resumption notice shall be subject to the Associate taking corrective action for the breach of contract conditions within the time frame and as per the terms specified in the suspension notice.

22 TERMINATION OF CONTRACT

22.1 Termination for Default/Breach of Contract

The contract / PO /RC shall be subject to termination by TPCODL in case of breach of the contract by the Associate which shall include but not be limited to the following:

a. Withdrawal or intimation by the Associate of its intent to withdraw or surrender the execution / completion of the contracted work /PO or failure in ensuring adherence to any delivery schedules, in deviation of the contract/PO.

b. Refusal or neglect on the part of the Associate to supply material/equipment of quantity or quality as specified by TPCODL and within the timeframe as specified in the contract document or refusal or neglect to execute the services/work in terms of the agreed standards of quantity or quality and/or within the timeframe specified in the contract/PO.

c. Failure in any respect to perform any portion of the Work contracted with promptness, diligence, or in accordance with the terms of the contract.

d. Failure to furnish guarantees as specified and /or failure to comply with the terms thereof.

e. Failure to furnish such relevant documents or information within the time specified which may be necessary for due execution / completion of the works and documentation.

f. Liquidation, bankruptcy either voluntary or involuntary OR entering into any composition or compromise with its creditors, or Insolvency.

g. In case any reasonable information has been received by TPCODL that Associate has adopted/ or attempted to adopt any unethical conduct, action in award of the contract /PO or at any time thereafter.

h. Failure to comply with applicable statutory provisions as contained in the contract or failure to comply with the applicable laws.

i. Failure to comply with safety regulations/clauses stipulated in the contract or as may be generally instructed by TPCODL.

If the default or breach as specified under clause 22 (except sub clause g thereof) be committed by the associate for the first time, TPCODL shall issue, along the with notice of default or breach, a warning notice instructing the associate to take remedial/corrective action within the time frame stipulated in the warning notice and not to repeat the same in future. The timeframe for corrective action by the associate shall be specific to the nature of breach of contract and the same shall not be objected to by the Associate. If the Associate fails to comply with the instructions in the warning notice or in taking corrective action to the satisfaction of TPCODL then TPCODL may terminate the entire or part of contract at its discretion by issuing termination notice without incurring any liability on this ground.

In case the contract is terminated for any breach of the nature specified in clause 22 g stated above, TPCODL shall have the right to terminate all the contracts TPCODL is having with the Associate by issuing termination notice which shall be without prejudice to the other rights of TPCODL available to it under law.
Without prejudice to its right to terminate for breach of contract, TPCODL may, without assigning any reason, terminate the Contract in whole or in part at any time at its discretion while the contract is in force by serving a written notice of two weeks to the Associate.

In the event of TPCODL having proceeded with termination of the contract the associate shall comply and proceed further in the following manner:

a) Associate shall discontinue the supply, on the expiry of the said period of two weeks.

b) Associate shall ensure that no further steps are being taken towards discharge of the obligations, terms and conditions as contained in the contract/PO. This shall include initiation of actions not limited to discontinuation of other allied and associated arrangements which the associate might have entered into with third parties for due discharge of its obligations under the contract with TPCODL.

c) The Associate shall perform thereafter such tasks as may be necessary to preserve and protect the terminated portion of the material/service/work in progress and the materials and equipment at TPCODL sites or in transit thereto. However the associate shall continue to fulfill its contractual obligations with regard to the part of contract not terminated.

d) It shall be open for TPCODL to conduct a joint assessment with the associate of the material, supplies, equipment ,works or in general as to the subject matter of the contract in regard to which the associate claims having completed its obligations before or during such termination.

e) It shall be open to TPCODL to seek invocation of the performance bank guarantee or any other guarantee or other security deposit by whatever name called submitted by the associate, which shall not be objected to or protested against by the associate.

In case of termination of the contract the parties agree to be governed inter alia by the following:

a) In case TPCODL exercises its right of termination as stated above the associate shall not dispute or object to the same.

b) The Associate shall be entitled to receive and claim only such payments OR sums of money from TPCODL as may be found payable to it in regard to works executed by it under the terms of the contract and no other claim of any nature whatsoever shall be made by the Associate.

c) All such provisions which the parties have agreed to survive and prevail even after termination of the contract shall remain effective despite the termination.

In the event of such termination, TPCODL may finish the Work by whatever method it may deem expedient, including the hiring of services and /or purchase of material equipment from such third parties as TPCODL may deem fit or may itself provide any labor or materials and perform any part of the Work. The associate undertakes to bear the incremental costs if any paid by TPCODL in such a case attributable to failure on the part of the associate. The Associate in such a case shall not be entitled to receive any further payments and any sums found payable to it may be adjusted by TPCODL against the amount recoverable from him on this ground. The same shall be without prejudice to other rights available to TPCODL under law against the associate.
Upon the termination of any of the contract due to occurrence of any circumstances provided in clauses stated above and constituting repeated breach or misconduct , TPCODL shall be entitled to bar the associates its agents , affiliates from undertaking any negotiation / tendering, bidding , participation activities concerning TPCODL for a period of two years from date of such termination. The same shall be without prejudice to other rights available to TPCODL.

22.2 Termination for Convenience of Associate

Associate at its convenience may request for termination of contract, clearly assigning the reason for such request. TPCODL has full right to accept, reject or partially accept such request. However, associate shall continue its supply as per contract till final approval is given to associates for such termination.

22.3 Termination for Convenience of TPCODL

TPCODL at its sole discretion may terminate the contract by giving 30 days prior notice in writing or through email to the Associate. TPCODL shall pay the Associate for all the supplies/ services rendered till the actual date of contract termination against submission of invoice by the Associate to that effect.

23.0 DISPUTE RESOLUTION & ARBITRATION

In case of any dispute or difference the parties shall endeavour to resolve the same through conciliatory and amicable measures within 15 Days failing which the matter may be referred by either party for resolution by the sole arbitrator to be appointed mutually by both the parties. The arbitral proceedings shall be conducted in accordance with Arbitration and Conciliation Act 1996 and the place of arbitration shall be Bhubaneswar. The language to be used at proceedings shall be English and the award of the arbitrator shall be final and binding on the parties. The parties shall bear their respective costs of arbitration. The associate shall continue to discharge its obligations towards due performance of the works as per the terms of the contract during the

arbitration proceedings unless otherwise directed in writing by TPCODL or suspended by the arbitrator. Further, TPCODL shall continue making such payments as may be found due and payable to the associate for such works.

23.1 Governing Laws and Jurisdiction

The parties shall be subject to the jurisdiction of the courts of law in Bhubaneswar and any matter arising here from shall be subject to applicable law in force in India.

24.0 ATTRIBUTES OF GCC

24.1 Cancellation

The Company reserves the right to cancel, add, delete at its sole discretion, all or any terms of this GCC or any contract, order or terms agreed between the parties in pursuance without assigning any reasons and without any compensation to the Associates.

24.2 Severability

If any portion of this GCC is held to be void, invalid, or otherwise unenforceable, in whole or part, the remaining portions of this GCC shall remain in effect.

24.3 Order of Priority

In case of any discrepancies between the stipulations in General Conditions of the Contract (GCC) and Special Conditions of Contract (SCC), the GCC shall stand superseded by the SCC to the extent stipulated hereinabove while balance portion of respective clauses of GCC shall continue to be applicable.

25.0 ERRORS AND OMISSIONS

The Associate shall be responsible for all discrepancies, errors and omissions in the drawings, documents or other information submitted by him, irrespective of whether these have been approved, reviewed or otherwise accepted by the TPCODL or not. However any error in design/drawing arising out of any incorrect data/written information from TPCODL will not be considered as error and omissions on part of the Associate.

26.0 TRANSFER OF TITLES

The title of ownership and property to all equipment, materials, drawings & documents shall pass to the TPCODL on acceptance of material by store/site after Inspection.

However, such passing of title of ownership and property to the TPCODL shall not in any way absolve, dilute or diminish the responsibility and obligations of the Associate under this Contract including loss or damages and all risks, which shall vest with the Associate.

27.0 INSURANCE

The Contractor shall take out the Insurance Policies which shall cover all risks including the following, as applicable:-

a) The value of the policy shall cover the total value of all the items till they are handed over to TPCODL.

b) TPCODL shall be the principal holder of the policy. The Associate shall be the loss payee under the policy. Associate / Sub-contractor of the Associate shall not be holders or beneficiaries in the policy nor shall they be named in the policy. TPCODL reserves the exclusive right to assign the policy.

c) While the payment of premium may be phased in agreement with the insurance company, at no time shall goods and services required to be provided by the associate shall remain uninsured in accordance with (a) above.

d) A copy of the Insurance policy shall be made available to TPCODL prior to first dispatch lot of any Equipment and policy shall be kept alive and valid at all times up to the stage of final acceptance.

e) TPCODL reserves the right to take out whatever policy that is deemed necessary by him if the associate fails to keep the said policy alive and valid at all times and/or causes lapses in payment of premium thereby jeopardizing the said policy. The cost of such policy(s) shall be recovered / deducted from the amount payable to the associate.

f) The policy shall ensure that the TPCODL's decision regarding replacement of goods damaged, lost or rendered unusable shall be final.

In all cases, the associate shall lodge the claims with the underwriters and also settle the claims and shall also notify TPCODL of any filed claims. However, the associate shall proceed with the repairs and/or replacement of the equipment/components without waiting for the settlement of the claims. In case of seizure of materials by concerned authorities, the associate shall arrange prompt release against bond, security or cash as required. TPCODL, upon request by the associate, will extend all reasonable assistance to the associate in such a case.

All the insurance claims shall be processed and settled by the associate and the missing/damaged items shall be replaced/repaired by them without any extra cost to TPCODL and without affecting the completion time.

28.0 SUGGESTIONS & FEEDBACK

We welcome all our Business Associates to write to us about their experience with TPCODL; be it our Company, our services or our people. Each and every concern, issue, query and suggestion from you will help us to become a better company to work with and shall help us develop a strong bonding of trust and a long term relationship with you.

You may send your feedback by filling up our Business Associate Feedback Form enclosed herewith as *Annexure-E.* You can also log on to our website www.tpcentralodisha.com to provide your feedback.

- Suggestions for us
- Feedback form
- Knowledge Sharing/ Experience with TPCODL
- Any issues with TPCODL.

Submission of feedback form is mandatory before the release of final payment to the BA.

29.0 CONTACT POINTS

In case Business Associate needs information with respect to payments or has any grievances, same may be lodged by log on to our website www.tpcentralodisha.com

30.0 LIST OF ANNEXURES

S. No.	Subject	Annexure

ANNEXURE-A

PROFORMA FOR BID SECURITY BANK GUARANTEE

The TP Central Odisha Distribution Limited
Bhubaneswar

WHEREAS, (Name of the Bidder) _____

(hereinafter called “the BIDDER”) has submitted his bid dated_____ for the (Name of Contract) _____ (hereinafter called “the BID”).

KNOW ALL men by these presents we (Name of the Bank) _____ of (Name of the Country) _____ having our registered office at_____(hereinafter called "the BANK) are bound unto The TP Central Odisha Distribution Limited (TPCODL) in the sum of _____ for which payment well and truly to be made to the TPCODL the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this _____ day of _____ 20_____.

The CONDITIONS of this obligation are**:**

i) If the Bidder withdraws his Bid during the period of bid validity specified in the Proforma of Bid or

ii) If the Bidder having been notified of the acceptance of his Bid by the TPCODL during the period of bid validity fails or refuses to furnish the Contract Performance Bank Guarantee, in accordance with the Instructions to Bidders.

We undertake to pay the TPCODL upto the above amount upon receipt of its first written demand, provided that in its demand the TPCODL will note that amount claimed by it is due to it owing to the occurrence of one or both conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force upto and including the date (No of days as mentioned in tender enquiry) days after the closing date of submission of bids as stated in the Invitation to Bid or as extended by you at any time prior to this date, notice of which extension to the Bank being hereby waived, and any demand in respect thereof should reach the Bank not later than the above date.

DATE …… SIGNATURE OF THE BANK ……..

WITNESS …… SEAL ……..

(Signature, Name & Address) (At least 2 witnesses)

ANNEXURE- B

PROFORMA FOR PERFORMANCE BANK GUARANTEE (CP cum EP)

(On Rs.100/- Stamp Paper) Note:

a) Format shall be followed in toto
b) Claim period of one month must be kept up
c) The guarantee to be accompanied by the covering letter from the bank confirming the signature to the guarantee

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The TP Central Odisha Distribution Limited

Bhubaneswar

CP cum EP BG No……

Order/Contract No……dated……

1. You have entered into a Contract No _____ with M/s._____ (hereinafter referred to as "the Vendor") for the supply cum erection / civil work of _____ (hereinafter referred to as" the said Equipment") for the price and on the terms and conditions contained in the said contract.
2. In accordance with the terms of the said contract, "the Vendor" agreed to furnish you with an irrevocable, unconditional and acceptable bank guarantee for 10% of the value of contract and to be valid till the end of Guarantee period plus one month towards "Contract cum Equipment performance". For this purpose you have agreed to accept the guarantee.
3. In consideration thereof, we, _____ hereby irrevocably and unconditionally guarantee to pay to you on demand but in any case before the end of five working days from the date of the claim and without demur and without reference to "the Vendor" such amount or amounts not exceeding the sum of Rs._____ (Rupees _____ only) being _____% (_____ percent) of the total value of the contract on receipt of your intimating that "the Vendor" has not fulfilled his contractual obligations. You shall be the sole judge for such non-fulfillment and "the Vendor" shall have no right to question such judgment.
4. You shall have the right to file / make your claim on us under the guarantee for a **further period of one month** from the date of expiry.
5. This guarantee shall not be revoked without express consent and shall not be affected by your granting time or any other indulgence to "the Vendor", which shall include but not be limited to, postponement from time to time of the exercise the same in you or any right which you may have against "the Vendor" and to exercise the same in any covenant contained or implied in the said contract or any other course or remedy or security available to you, and our Bank shall not be released from its obligations under this guarantee by

your exercising any of your rights with reference to matters aforesaid or any of them or by reasons of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under the law would, but for this provision have the effect of relieving our bank from its obligation under this guarantee.

6. We also agree that you shall be entitled at your option to enforce this guarantee against our bank as a principal debtor, in the first instance, notwithstanding any other security or guarantee that you may have in relation to “the Vendor’s” liabilities in respect of the premises

7. This guarantee shall not be affected by any change in the constitution of our Bank or “the Vendor” or for any other reason whatsoever.

8. Any claim / extension under the guarantee can be lodge-able at outstation banks or at Bhubaneswar branch and claim will also be payable at Bhubaneswar Branch (to be confirmed by Bhubaneswar Branch by a letter to that effect in case BG is from the branch outside Bhubaneswar).

9. Notwithstanding anything herein contained, our liability under this guarantee is limited to Rs._____ (Rupees_____ only and the guarantee will remain in force upto and including _____(Date) and shall be extended from time to time for such period or period as may be desired by “the Vendor”.

10. Unless a demand or claim under this guarantee is received by us in writing within one months from_____ (expiry date) i.e. on or before _____ (claim period end date), we shall be discharged from all liabilities under this guarantee thereafter.

Dated at_____ this_____ day of _____ 20__

Bank’s rubber stamp

1. Banks full address

Designation of Signatory

2. Bank official number

ANNEXURE-C

PROFORMA FOR "NO DEMAND CERTIFICATE" BY ASSOCIATE

(On Company's Letter head or with Company Seal)
(To be submitted by the Associate to TPCODL Accounts Department at the time of receipt of full and final payment)

(Certificate No. CCP/002)

Name of the Project Order/

Contract No.

Dated

Name of the Associate Scheme

No. / Job No.

We, M/s._____ (Associate) do hereby acknowledge and confirm that we have received the full and final payment due and payable to us from TPCODL, in respect of our aforesaid Order No _____ dated_____ including amendments, if any, issued by TPCODL to our entire satisfaction and we further confirm that we have no claim whatsoever pending with TPCODL under the said contract / W.O.

Notwithstanding any protest recorded by us in any correspondence, documents, measurement books and / or final bills etc., we waive all our rights to lodge any claim or protest in future under this contract.

We are issuing this "NO DEMAND CERTIFICATE" in favour of TPCODL, with full knowledge and with our free consent without any undue influence, misrepresentation, coercion etc.

Place **Name**

(Company Seal)

ANNEXURE-D

PROFORMA FOR APPLICATION FOR ISSUANCE OF CONSOLIDATED TDS CERTIFICATE

To be printed on the letterhead

To,

The TP Central Odisha Distribution Limited,

Bhubaneswar

Sub: Application for issuance of Consolidated TDS Certificate for the FY _____

Dear Sir,

I / we hereby request / authorize you to issue me / us a consolidate TDS Certificate for the financial year _____ against tax deducted at source by you from my / our payments / bills during the said year from time to time under Chapter XVII – B of the Income Tax Act, 1961.
For and on behalf of

Signature

Name

Address

Contact No. (Land Line)

(Mobile)

PAN #

Assessing authority

ATTACH THE COPY OF PAN CARD

ANNEXURE-E

BUSINESS ASSOCIATE FEEDBACK FORM

With an objective to improve our internal processes and systems, and serve you better, we solicit your valuable feedback & suggestions. It is estimated that it will take about 10 minutes to complete this survey. We assure you that your feedback shall be kept confidential. Please send the duly filled feedback form in the "TPCODL addressed - attached envelop"

You are associated with us as

☐ OEMs ☐ Service Contractor ☐ Material Suppliers ☐ Material & Manpower Supplier

You are associated with us for

☐ Less than 1 year ☐ More than 1 year but less than 3 years ☐ More than 3 years

Your office is located at

☐ Bhubaneswar ☐ Within 200 kms from Bhubaneswar ☐ More than 200 kms from Bhubaneswar

Your nearly turnover with TPCODL

☐ Less than 25 Lacs ☐ 25 Lacs to 1 Crore ☐ More than 1 Cr.

Additional Information

Your Name	
Your Designation	
Your Organization	
Contact Nos.	
Email	

We once again thank you for your participation in this survey. Please spare 10 minutes to give your feedback on following pages (Section A to E)

SECTION – A

(Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement).

S. No.	Parameters	1 Do Not Agree	2 Slightly in Agreement	3 In Fair Agreement	4 Mostly in Agreement	5 Fully Agree	Remarks/ Suggestion
1	You receive all relevant queries / tenders from us in timely manner.						
2	We provide you enough lead time to respond to our queries / tenders.						
3	We provide you adequate support (drawings, documents, clarifications, briefing etc.) to enable you meet our requirements.						
4	All following elements of our contract / purchase order are rational :						
4.1	Scope of Work						
4.2	Delivery / Execution Schedule						
4.3	Payment Terms						
4.4	Liquidated Damages						
4.5	Performance Guarantee						
5	Our purchase orders / contracts are simple, specific & easy to understand						
6	TPCODL demonstrate willingness to be flexible in administration of Contract / Purchase Order						
7	We provide timely responses / clarifications to your queries						
8	TPCODL representative you interact / coordinate with is adequately empowered to support you in meeting contractual obligations						
9	TPCODL provide you all necessary infrastructure support for timely and quality completion of work (including AMC)						
10	TPCODL Engineer-in-Charge timely certifies the jobs executed/ material supplied						
11	TPCODL Engineer-in-Charge efficiently supervises the job execution for timely completion of job						
12	BIRD (Bill Inward Receipt Desk) initiative has improved payment disbursement process						

S. No.	Parameters	1 Do Not Agree	2 Slightly in Agreement	3 In Fair Agreement	4 Mostly in Agreement	5 Fully Agree	Remarks/ Suggestion
13	Our approach for Inspection and Quality Assurance effective to expedite project completion?						
14	TPCODL never defaults on contractual terms						
15	In TPCODL Contracts closure is done within set time limit						
16	Our material receiving procedures are well defined and efficiently deployed to reduce mutual inconvenience						
17	Bank Guarantees are released in time bound manner						
18	Our processes related to payment / account settlement are effective.						
19	You get payments on time						
20	TPCODL Employees follow Ethical behaviour						

SECTION – B

SECTION – B (Please rate the following parameters on a scale of 1 to 5, where 1 - Minimum; 5 - Maximum)

S. No.	Parameters	1	2	3	4	5	Remarks/ Suggestion
1	How do you rate courtesy/ empathy/ attitude level and warmth of TPCODL employees you interact with from following team?						
1.1	Project Engineering						
1.2	District / Zones						
1.3	Projects/HOG (TS &P)						
1.4	Inspection & Quality Assurance						
1.5	Stores						
1.6	Metering & Billing						
1.7	Accounts / Finance						
1.8	Administration						
1.9	IT & Automation						
2	How would you rate TPCODL in comparison to your other clients in terms of **fairness of treatment and transparency** with its Business Associates?						
3	How would you rate TPCODL in comparison to your other clients in terms of **processes and systems to manage partnership** with its Business Associates						
4	How would you rate TPCODL in comparison to your other clients in terms of **building long term & mutually relations**hip with its Business Associates						

SECTION – C

Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement.

S. No.	Parameters	Certainly No	Probably No	Certainly Yes	Probably Yes	Remarks/ Suggestion
1	Based on your experience with TPCODL, would you like to continue your relationship with TPCODL?					
2	If someone asks you about TPCODL, would you talk “positively” about					

	TPCODL?					
3	Would you refer TPCODL name to others in your community, fraternity and society as a professional & dynamic organization?					

SECTION - D

If we ask you to rate us on a scale of 1 to 10, how will you rate TPCODL, that truly represents your overall satisfaction with us (please tick appropriate box) -

1	2	3	4	5	6	7	8	9	10

SECTION – E

Please √ mark in the relevant box and give your remarks / suggestions / information for our improvement.

Please spare your thoughts for TPCODL's improvement in particular areas of weaknesses, particularly relating to some great practices, attitudes that you have seen elsewhere in Indian and International Organizations, which you recommend TPCODL to adopt. Please give your valuable salient recommendations.

Please spare your thoughts for TPCODL's improvement in particular areas of major concerns for you. We also welcome your suggestions to adopt any best practices, altitudes that you

Recommendation	*Please tick (√) your top 5 expectations out of the following 10 points listed below -*	
(Please list down improvement you expect from TPCODL)	*Timely payment*	
1	*Flexibility in Contracts/PO*	
	Clarity in PO,s & Contracts	
2	*Timely response to quarries*	
	Timely certification of works executed	
3	*Clarity in Specs, drawings, other docs etc.*	
	Adequate information provided on website for tender notification, parties qualified etc.	
4	*Timely receipt of material at site for execution*	
	Performance Guarantee/EMD released in time	

5	*Inspection & quality assurance support for timely job completion*	

We thank you for your time and courtesy!!

ANNEXURE-F

ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT

(To be signed and stamped by the bidder prior to participation in the auction event)

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 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-G

To,

DGM (Finance)
The TP Central Odisha Distribution Limited
Bhubaneswar

Sub: **e-Payments through National Electronic Fund Transfer (NEFT) OR Real Time Gross Settlement System (RTGS)**

Dear Sir,

We request and authorize you to affect e-payment through NEFT/RTGS to our Bank Account as per the details given below:-

Vendor Code	:	
Title of Account in the Bank	:	
Account Type	:	(Please mention here whether account is Savings/Current/Cash Credit)
Bank Account Number	:	
Name & Address of Bank	:	
Bank Contact Person's Names	:	
Bank Tele Numbers with STD Code	:	
Bank Branch MICR Code	:	(Please enclose a Xerox a copy of a cheque. This cheque should not be a payable at par cheque)
Bank Branch IFSC Code	:	(You can obtain this from branch where you have your account)
Email Address of accounts person: (to send payment information)	:	

Name of the Authorized Signatory: :

Contact Person's Name:

Official Correspondence Address:

We confirm that we will bear the charges, if any, levied by our bank for the credit of NEFT/RTGS amounts in our account. Any change in above furnished information shall be informed to TPCODL well in time at our own. Further, we kept TPCODL indemnified for any loss incurred due to wrong furnishing of above information.

Thanking you,

For _____

(Authorised Signatory)

(Signature with Rubber Stamp)

Certification from Bank:

We confirm that we are enabled for receiving NEFT/RTGS credits and we further confirm that the account number (specify Bank a/c no.) of (Please mention here name of the account holder), the signature of the authorised signatory and the MICR and IFSC Code of our branch mentioned above are correct.

This also is certified that the above information is correct as per Bank record

(Manager's/ Officers Signature under Bank Stamp)

ANNEXURE-H

VENDOR APPRAISAL FORM

TO BE SUBMITTED BY VENDOR (To be filled as applicable)			
VENDOR:			
1.0	**DETAILS OF THE FIRM**		
	1.1	NAME (IN CAPITAL LETTERS)	:
	1.2	TYPE OF CONCERN (PROPRIETARY) Partnership, Pvt. Ltd., Public Ltd. etc.	:
	1.3	YEAR OF ESTABLISHMENT	:
	1.4	LOCATION OF OFFICE POSTAL ADDRESS TELEGRAPHIC ADDRESSES, TELEX NO. FAX NO.	:
	1.5	LOCATION OF MANUFACTURING UNITS	:
		i) UNITS 1	:
		ii) OTHER UNITS	:
2.0	**PRODUCTS MANUFACTURED**		:
3.0	**TURNOVER DURING THE LAST 3 YEARS (TO BE VERIFIED WITH THE LATEST PROFIT & LOSS STATEMENT).**		:
4.0	**VALUE OF FIXED ASSETS**		:
5.0	**NAME & ADDRESS OF THE BANKERS**		:
6.0	**BANK GUARANTEE LIMIT**		:
7.0	**CREDIT LIMIT**		:
8.0	**TECHNICAL**		
	8.1	NO. OF DESIGN ENGINEERS (INDICATE NO. OF YEARS EXPERIENCE IN RELATED FIELDS)	:
	8.2	NO. OF DRAUGHTS MEN	:
	8.3	COLLABORATION DETAILS (IF ANY)	:
		8.3.1 DATE OF COLLABORATION	:
		8.3.2 NAME OF COLLABORATOR	:
		8.3.3 RBI APPROVAL DETAILS	:
		8.3.4 EXPERIENCE LIST OF COLLABORATOR	:
		8.3.5 DURATION OF AGREEMENT	:
	8.4	AVAILABILITY OF STANDARDS / DESIGN PROCEDURES / COLLABORATOR'S /	:

		DOCUMENTS (CHECK WHETHER THESE ARE LATEST/CURRENT	
	8.5	TECHNICAL SUPPORT, BACK-UP GUARANTEE, SUPERVISION, QUALITY CONTROL BY COLLABORATOR (WHEREVER ESSENTIAL). (THIS CLAUSE IS RELEVANT WHEN VENDOR'S EXPERIENCE IS INADEQUATE)	:
	8.6	QUALITY OF DRAWINGS	:
9.0	**MANUFACTURE**		
	9.1	SHOP SPACE, LAYOUT LIGHTING, VENTILATION, ETC.	:
	9.2	POWER (KVA)	:
		MAINS INSTALLED	:
		UTILIZED	:
		STANDBY POWER SOURCE	:
	9.3	MANUFACTURING FACILITIES (ATTACH LIST OF EQUIPMENT AS APPLICABLE)	:
		9.3.1 MATERIAL HANDLING	:
		9.3.2 MACHINING	:
		9.3.3 FABRICATION	:
		9.3.4 HEAT TREATMENT	:
		9.3.5 BALANCING FACILITY	:
		9.3.6 SURFACE TREATMENT PRIOR TO PAINTING/ COATING, POLISHING, PICKLING, PASSIVATION, PAINTING, ETC.	:
	9.4	SUPERVISORY STAFF	:
	9.5	ADEQUACY OF SKILLED LABOURS (MACHINISTS, WELDERS, ETC.)	:
	9.6	NO. OF SHIFTS	:
	9.7	TYPE OF MATERIAL HANDLED (SUCH AS CS, SS, ETC.)	
	9.8	WORKMANSHIP	:
	9.9	MATERIAL IN STOCK AND VALUE	:
	9.10	TRANSPORT FACILITIES	:
	9.11	CARE IN HANDLING	:
10.0	**INSPECTION / QC / QA / TESTING**		
	10.1	NUMBER OF PERSONNEL (INDICATE NO. OF YEARS OF EXPERIENCE)	:
	10.2	INDEPENDENCE FROM PRODUCTION	:

	10.3	AVAILABILITY OF PROCEDURAL WRITE UP/QUALITY PLAN	:
	10.4	INCOMING MATERIAL CONTROL AND DOCUMENTATION	:
	10.5	RELIABILITY/REPUTATION OF SUPPLY SOURCES	:
	10.6	STAGE INSPECTION AND DOCUMENTATION	:
	10.7	SUB-ASSEMBLY & DOCUMENTATION	:
	10.8	FINAL INSPECTION AND DOCUMENTATION	:
	10.9	PREPARATION OF FINAL DOCUMENTATION PACKAGE	:
	10.10	TYPE TEST FACILITIES	:
	10.11	ACCEPTANCE TEST FACILITIES	:
	10.12	CALIBRATION OF INSTRUMENTS AND GAUGES (WITH TRACEABILITY TO NATIONAL STANDARDS) (ATTACH LIST)	:
	10.13	STATUTORY APPROVALS LIKE BIS, IBR, ETC.(AS APPLICABLE)	:
	10.14	SUB-VENDOR APPROVAL SYSTEM AND QUALITY CONTROL	:
	10.15	DETAILS OF TESTS CARRIED OUT AT INDEPENDENT RECOGNIZED LABORATORIES	:
		i) FURNISH LIST OF TESTS CARRIED OUT AND THE NAME OF THE LABORATORY WHERE THE TESTS WERE CONDUCTED	:
		ii) CHECK AVAILABILITY OF CERTIFICATES AND REVIEW THESE WHEREVER POSSIBLE	:
11.0	**EXPERIENCE (INCLUDING CONSTRUCTION / ERECTION / COMMISSIONING) TO BE FURNISHED IN THE FORMAT INDICATED IN APPENDIX)**		:
12.0	**SALES, SERVICE AND SITE ORGANIZATIONAL DETAILS**		:
13.0	**CERTIFICATE FROM CUSTOMERS (ATTACH COPIES OF DOCUMENTS)**		:
14.0	**POWER SITUATION**		:
15.0	**LABOUR SITUATION**		:
16.0 *	**APPLICABILITY OF SC/ST RELAXATION (Y/N)** **IF YES, SUPPORTING DOCUMENTS TO BE ATTACHED**		
17.0	**ORGANIZATIONAL DETAILS** 1. PF NO 2. ESI NO 3. INSURANCE FOR WORK MAN COMPENSATION ACT NO 4. ELECTRICAL CONTRACT LIC NO 5. ITCC / PAN NO 6. SALES TAX NO 7. WC TAX REG. NO		:
18.0	**DOCUMENTS TO BE ENCLOSED:**		

	1. FACTORY LICENSE 2. ANNUAL REPORT FOR LAST THREE YEARS 3. TYPE TEST REPORT FOR THE ITEM 4. PAST EXPERIENCE REPORTS 5. ISO CERTIFICATE –QMS, EMS, OHAS, SA 6. REGISTRATION OF SALES TAX 7. COPY OF TIN NO. 8. COPY OF SERVICE TAX NO. 9. REGISTRATION OF CENTRAL EXCISE 10. COPY OF INCOME TAX CLEARANCE. 11. COPY OF PF REGISTRATION 12. COPY OF ESI REGISTRATION 13. COPY OF INSURANCE FOR WORK MAN COMPENSATION ACT NO 14. COPY OF ELECTRICAL CONTRACT LIC NO 15. COPY OF PAN NO 16. COPY OF WC TAX REGISTRATION 17. DOCUMENTS IN SUPPORT OF SC/ST RELAXATION AT S.NO.16.0 18. GSTN CERTIFICATE	

*** Classification of BA s under SC/ST shall be governed under following guidelines:**

- **Proprietorship/ Single Ownership Firm:** Proprietor of the firm should be from SC/ST community. Governing document shall be Proprietorship Deed.
- **Partnership Firm:** Only such firms shall qualify which have SC/ST partners holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Partnership Deed.
- **Private Limited Company:** Only such firms shall qualify which have SC/ST directors holding equal to or more than 50% of the total ownership pattern of the firm. Governing document shall be Memorandum of Understanding (MoU) and/or Article of Association (AoA).

NOTE: Certification from SC/ST Commission shall be required for deciding upon SC/ST status of a person.

ANNEXURE-I

MANUFACTURER AUTHORIZATION FORM

(To be submitted on OEM's Letter Head)

Date: …….

Tender Enquiry No.: ……..

To,

Chief (Procurement & Stores)

The TP Central Odisha Distribution Limited,
Bhubaneswar

Sir,

WHEREAS M/s. *[name of OEM]*, who are official manufacturers of …… having factories at *[address of OEM]* do hereby authorize M/s *[name of bidder]* to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods, manufactured by us

……and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with the Special Conditions of Contract or as mentioned elsewhere in the Tender Document, with respect to the Goods offered by the above firm in reply to this Invitation for Bids.

We hereby confirm that in case, the channel partner fails to provide the necessary services as per the Tender Document referred above, M/s *[name of OEM]* shall provide standard warranty on the materials supplied against the contract. The warranty period and inclusion / exclusion of parts in the warranty shall remain same as defined in the contract issued to their channel partner against this tender enquiry.

Yours Sincerely,

For ……..

Authorized Signatory

Annexure VIII

Safety Policy and Safety Terms and Conditions

Contractor's Safety Code of Conduct

Reason for Change	Prepared By	Checked By	Approved by
Revision to accommodate Existing changes in org structure and to simplify the procedure	Rajesh Sharma *(Head-Safety Generation)*	Suresh Khetwani *(Chief - Safety & Environment)* Monish Kumar *(Chief -Corporate Contract)*	V. V. Namjoshi (Chief Generations)

INDEX

1. Objective

The Tata Power engages contractor workforce to execute, run and maintain various operating sites and facilities across locations for various business verticals including Generation, Transmission, Distribution and Renewable. The activities range from project execution, operation, maintenance to facilities management.

The management of contractor safety represents a significant challenge for management. Tata Power has a responsibility to ensure that contractors are provided with enough information and support to enable them to conduct their roles safely and without endangering health and safety of their own workforce or that of our staff.

To ensure reduction in reportable injuries and achieve goal of zero accidents, first edition of contractor safety code of conduct was launched successfully in the year 2014. Since last four years after the launch of CSCC, Tata Power could achieve the objective of reduction in reportable injuries and fatalities.

Over the period, as the system was being matured, a need was felt to make second revision of the CSCC process. Objective of second revision is improve existing CSCC system and make it user friendly.

2. Scope:

This procedure applies to all operating and project sites of The Tata Power Company Ltd and Group companies including new businesses like EV charging, Home Automation etc.

3. Definitions

3.1. **Order Manager:** Order Manager is the Tata Power representative, who has the ownership of the given job.

3.2. **Site Safety Management Plan**: It is the safety plan agreed between Contractor and Tata Power. It will contain the entire job specific safety requirement and will be signed by the contractor.

3.3. **Contractor**: An individual or a company that provides services to Tata Power under a signed contract.

3.4. **Emergency:** a serious, unexpected or dangerous situation requiring immediate action, which may result in loss of revenue/property, business discontinuity. In case of Emergency*, services may be procured by selecting the qualified vendor based on the vendor category without the safety bid evaluation. It must be approved by MB level and above.

3.5. **Expert Service jobs:** Jobs which needs expert services of contractor which does not involve direct exposure to the potential risk or work which involves only

supervisory work such as expert for turbine overhaul, expert for boiler overhaul, expert for pump and motor, expert for compressor overhaul.

3.6. **Head of the Division:** Business in charge of the division who is overall custodian of the generating station or transmission division or distribution division.

3.7. **Category A Vendor:** Vendor eligible to carry out Very High & High risk (as per Tata Power Hazard Identification and Risk Analysis Procedure) and /or Long-Term Contract related to operation and maintenance (O&M) of plant. Vendors must fulfil the requirement specified for Category A in Appendix 12-CSMF-5 of this document.

3.8. **Category B Vendor:** Vendors eligible to carry out technical jobs, that are classified under Medium /low risk. Vendors must fulfil the requirement specified for Category B in Appendix 12-CSMF-5 of this document.

3.9. **Category C Vendor:** Vendors eligible for to carry out low or very low risk administrative and office jobs. For this he must fulfil the requirement specified for Category C in Appendix 12-CSMF-5 of this document.

3.10. **Category D Vendor:** All Consultants, Medical Practitioners or vendors taking job from Tata Power and working from their own premises (e.g. motor rewinding at vendor's shop floor, equipment sent for repair to vendor's works etc.) are classified as Category D Vendor

3.11. **High Risk Jobs:** A Job or its activities are considered as Very High or High Risk when Order manager apply the "Tata Power Hazard Identification and Risk Analysis" procedure and found safety risk associated with are under Very High or High category. Indicative lists of jobs are given in appendix 15 of this document**.**

3.12. **Medium Risk Jobs:** Jobs or its activities are considered as medium risk when Order manager apply "Tata Power Hazard Identification and Risk Analysis" procedure and found the same as Medium Risk.

3.13. **Low Risk Jobs:** Any job or its activities are considered as Low or Very low risk while Order manager, calculate it by applying "Tata Power Hazard Identification and Risk Analysis" procedure and found it under Low or Very Low category.

3.14. **Long Duration Jobs:** When the duration of job is 12 months or more, it is considered as Long duration job

3.15. **High Value Jobs:** When the value of the job contract is Rs. One Crore or more it will be considered as High value job**.**

4. Responsibilities

4.1 Order Manager: Order Manager is the Tata Power representative, who is responsible for:

4.1.1 Finalizing the Site Safety Management Plan along with Contractor, Safety Concurrences Group, Divisional Safety Head and Expert (External or Internal) if required.

4.1.2 Supervise and ensure work is carried out as per the Site Safety Management Plan including agreed Risk Assessment (HIRA/JSA) and Method Statement.

4.1.3 Conduct audit and evaluate Safety Performance of contractor.

4.1.4 Ensure contractors adhere to all statutory provisions.

4.1.5 In case any deviation is needed in agreed safety management plan or in CSCC process for execution of job, Management of Change procedure will be applicable, and approval may be obtained from divisional head /Cluster head.

4.2 Contractor: The person, entity or organisation who is executing the job for Tata Power under a contractual agreement and will be responsible for the following

4.2.1 To follow all Tata Power Critical Safety Procedure, Rules and guidelines given in Safety Terms and Conditions

4.2.2 Undertake job as per Site Safety Management Plan CSM-F10 and method statements agreed with Tata Power.

4.2.3 Raise any concerns with regard to their work and its safety with the Tata Power Order Manager.

4.2.4 Report all injuries, near misses, unsafe acts/conditions, and occurrences to the Tata Power Order Manager immediately.

4.2.5 Ensure that all sub-contractors follow the Tata Power Safety Procedure and agreed Site Safety Management Plan CSM-F10.

4.2.6 To follow all statutory requirements as per the laws of the land.

4.2.7 All vendors applying for A category jobs or submitting quote for high risk jobs shall obtain certificates of ISO 9001, ISO14001 and ISO45001 before submitting quote for high risk Jobs.

4.3 Safety Concurrence Group: It is Cross Functional Team constituted by Corporate Safety Team, which will have representatives from Execution department, Divisional safety and Corporate / Divisional contracts. SCG will be responsible for the following

4.3.1 Assessment of Safety Potential of new vendor before registration as per CSM-F1-Safety Category Qualification Form.

4.3.2 Safety Evaluation of the bids as per evaluation format CSM-F-9 Safety Bid Evaluation Criteria

4.3.3 Finalization of the Site Safety Management Plan CSM-F-10 submitted by the contractor.

4.3.4 Corporate Safety Team / Cluster Safety Head will be part of SCG during Safety Bid Evaluation for following types of jobs

4.3.4.1 High-Risk jobs to be carried out in Annual Overhaul / Major Shutdowns and Outages.

4.3.4.2 Capex jobs of High-Risk Category

5.1 Vendor Registration

For Vendor Registration, Corporate Contract will issue following documents for evaluation of contractor's safety capability

1) CSM-F1 –Safety Category Qualification Form
2) Safety Terms and Conditions

The document Safety Terms and Conditions provides the information about Tata Power safety System to the contractor. Contractor will submit the CSM-F1- Safety Category Qualification Form with all relevant details and documents to Vendor Registration Initiator, which will in turn forward it to Safety Concurrence Group (SCG) for evaluation. The SCG will evaluate the details submitted by the contractor based on a predetermined criteria CSM-F-5 Safety Potential Evaluation Criteria for Vendor Registration and will determine the category (Category A/B/C/D) for which the contractor will be registered. As mentioned in the above criteria, a site visit may also be organized by SCG prior to registration under Category A and B. In case, the contractor does not qualify the safety criteria, the contractor will not be registered. However, he may apply afresh for registration after 6 months. Please refer Appendix 1: Process Flow Chart for Vendor Registration.

5.2 Bid evaluation

At the time of placing the Purchase Requisition (PR), Order Manager is required to declare the risk involved in the of the job (i.e. High Risk / Medium Risk / Low Risk jobs, based on the RPN in HIRA. If the Job is "High Risk" or "Long Duration", then RFQ will be attached with following documents:

1) CSM-F7- Blank Safety Competency Form
2) CSM-F8 PPE requirements
3) Safety Terms and Conditions
4) Job Specific Safety Requirement (Educational and Professional Qualification, Skill & Experience Manpower, Tools and Tackles (e.g. man lifter, use of drone, use & availability of rescue kit), Work Methodology etc.)

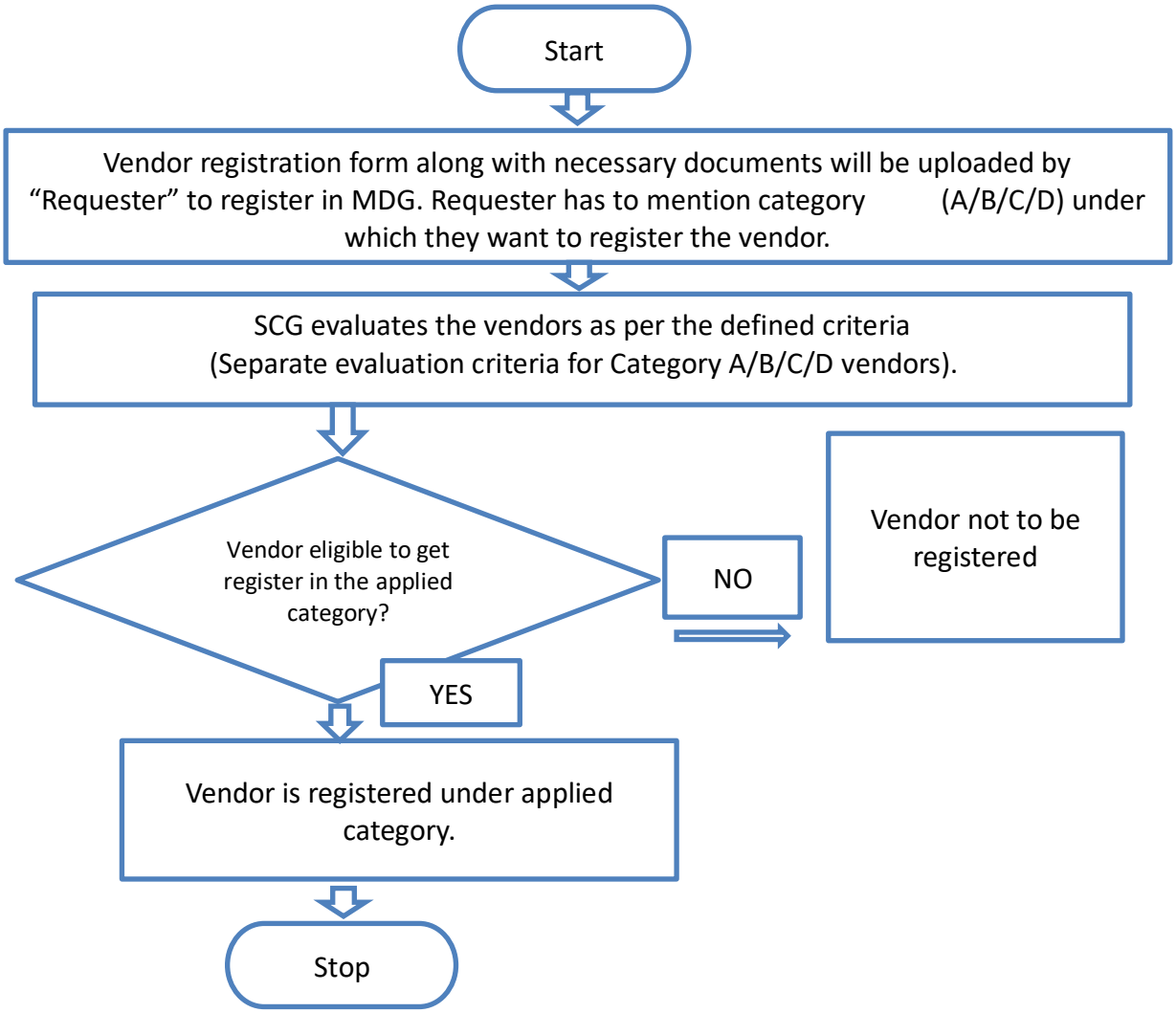
Otherwise the RFQ will be attached only with Safety Terms and Conditions. Long term and low value jobs (see definition) are exempted from the CSCC process.

Corporate Contracts will collect duly filledCSM-F7 Safety Competency Form along with the bid. All other stakeholders will also put their efforts to get all relevant safety data during meeting / discussions with the vendor. SCG will evaluate the document as per the CSM-F9 Safety bid evaluation criteria. If any specific condition related to Contract is required to convey to contractor, Site safety team will attach the same as Annexure for specific conditions of job and submit it to contract team along with safety bid evaluation form. Commercial bid of contractor will be considered for evaluation by contract team only if contractor is qualified in safety bid. Site Safety Management Plan, defining the complete procedure of executing the job at site will be signed by the contractor and SCG after mutual agreement. CC will attach a copy of site safety Management Plan and any specific condition of contract along with PO to the successful bidder. Please refer Appendix 6: Process Flow Chart for issuing RFQ and PO significant health and safety risk associated with it.

5.3 Safety Performance Evaluation

During the time of job execution, regular site inspection will be carried out by the Tata Power officials and violations will be dealt as per CSM–F4 Safety Violation Penalty Criteria. Apart from this, monthly safety performance of the contractor will be evaluated based on the predetermined criteria as per CSM-F11 safety Performance Score and monthly score will be maintained by the Order Manager. Certain percentage of each running bill will be retained as Safety Retention amount and will be released on the basis of Safety Performance Score at certain intervals as defined in CSM- F-3- Safety Performance Evaluation Criteria. Please refer Appendix 10: Process Flow Chart for Safety Performance Evaluation. Percentage of retention amount is mentioned in safety terms and conditions.

Appendix 1: Process Flow Chart for Vendor Registration



Appendix 2: CSM-F-1 Safety Category Qualification form

1. "**Safety Category Qualification Form**" is part of vendor registration form. It needs to be filled by the contractor at the time of Registration and should submitted to Requester / order manager with all relevant documents.
2. The same will be evaluated by Safety Concurrence Group of the Division (SCG) as per the criteria given in CSM-F-5.
3. Information provided by contractor will be verified during site visit.

Safety Category Qualification Form

Please Consider my application for

Category A Vendor: Vendor eligible to carry out Very High- and High-risk O&M jobs
Category B Vendor: Vendors eligible to carry out technical jobs, classified as Medium / low risk
Category C Vendor: Vendors eligible for to carry out low or very low risk administrative and office jobs
Category D vendor: All Consultants, Medical Practitioners or vendors taking job from Tata Power and working from their own premises.

<table>
<tr><td colspan="4">Name of the Vendor:</td></tr>
<tr><td>Sr. No</td><td>Safety Information</td><td>Remarks</td><td>Attachment</td></tr>
<tr><td>1</td><td>Certified for
i. OHSAS 18001/ ISO 45001,
ii. ISO: 14001
iii. ISO: 9001
(ISO certificates to be issued from reputed accreditation agencies specified by Tata Power)</td><td>i. Y/ N
ii. Y/ N
iii. Y/ N</td><td>Attach copy of the certification</td></tr>
<tr><td>2</td><td>Safety Statistics for Last Three (3) Years
- LTIFR
- LTISR</td><td>Yes/No</td><td><table><tr><td></td><td>Year 1 (Last FY)</td><td>Year 2</td><td>Year 3</td></tr><tr><td>LTIFR</td><td></td><td></td><td></td></tr><tr><td>LTISR</td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td>3</td><td>Do you have Safety Policy?</td><td>Yes/No</td><td>Attach copy of the safety policy.</td></tr>
<tr><td>4</td><td>Do you have Safety training process?</td><td>Yes/No</td><td>Attach safety training process.</td></tr>
<tr><td>5</td><td>Do you have Safety organization structure e.g. Safety Officers and Safety Committees?</td><td>Yes/No</td><td>Attach copy of the safety organization structure.</td></tr>
<tr><td>6</td><td>Name and address of sites where work is in progress or worked earlier</td><td>Yes/No</td><td>Site details to be attached for inspection by Officials.</td></tr>
</table>

Signature :
Name and Designation :
Stamp of Organization :

Appendix 3: Safety Terms and Conditions

Please refer the attached document Safety Terms and Conditions.

Appendix 4: CSM- F-3- Safety Performance Evaluation Criteria

1. A certain percentage of the bill value will be retained against every running bill as safety performance retention. The amount will be released with the last invoice or every six-month based on Safety Performance Score of contractors. The retention amount will be calculated based on contract value as below.

Contract Value	Retention Amount (%)
Up to 10 Lakhs	2.5
10 – 50 lakhs	2
0.5 to 10 Cr	1.5
>10 Cr	1

2. The evaluation criteria include Lead Indicators such as CFSA (Contractor Field safety Audit) score, percentage of workers trained in TPSDI, inspection of critical equipment. Lag indicators such as Fatalities, LWDC and man days lost.
3. The retention amount saved will go to a separate Safety Improvement Fund.
4. For the contract value of more than Rs 1 Cr or contract duration more than 12 months, the retention amount shall be released half yearly based on safety performance. For all remaining contracts, the retention amount will be released with the final bill.
5. Long term jobs with low value (Less than Rs. 1 Cr.) are exempted from the safety retention. Invoice of these type of jobs can be cleared without safety retention.
6. In case of job stoppage due to safety violations / unsafe observations at the site, no time extension shall be given to the contractor, if such delays are attributable to contractor.
7. In case of fatality, limb loss or loss of property, vendor must pay for liability, legal, statutory and additional mutually agreed settlement charges imposed by the appointed committee. This charge is over and above the retention amount.
8. The committee will finalize an amount between 5 -50 lakhs based on factors such as advise by statutory authorities, contract value and impact of accident etc.
9. Safety performance bonus 1% (limiting to 50 lakhs) of the invoice value will be considered at the end of the job if the contractual safety performance score 100%.
10. During the progress of the work, concerned Supervisor/Engineer will visit and inspect the work site regularly and evaluate the safety performance of the contractor based on matrix attached herewith and apply the Consequence management policy as applicable.
11. Order Manager, divisional chief and SBU head have the authority to terminate the contract in case of three consecutive serious violations.

Safety Performance Evaluation report- CSM-F-3

	Lead Indicators	Unit Of measurement	Target	weight age
1	% of Employee certified in TPSDI/Authorized agency	%	50%	10
2	CFSA score (Annexure 6.1)	Average Severity of Violations	1.49	20
3	Monthly inspection completed by contractor for Critical Equipment, lifting Tools & Tackles and hand tools used at site as per Tata Power Checklist	%	80	5
4	Revalidation of Condition of tools, tackles and equipment by Order Manger.	%	100	15
	Lag Indicators			
1	Number of Fatalities	No.	0	30
2	Number of Lost workday case (LWDC)	No.	0	10
3	Man-days Lost	No.	0	10

Appendix 5: CSM- F-4 Safety Violation Penalty Criteria

Penalty shall be imposed on the contractors under the following circumstances for breaching the contractual agreements:

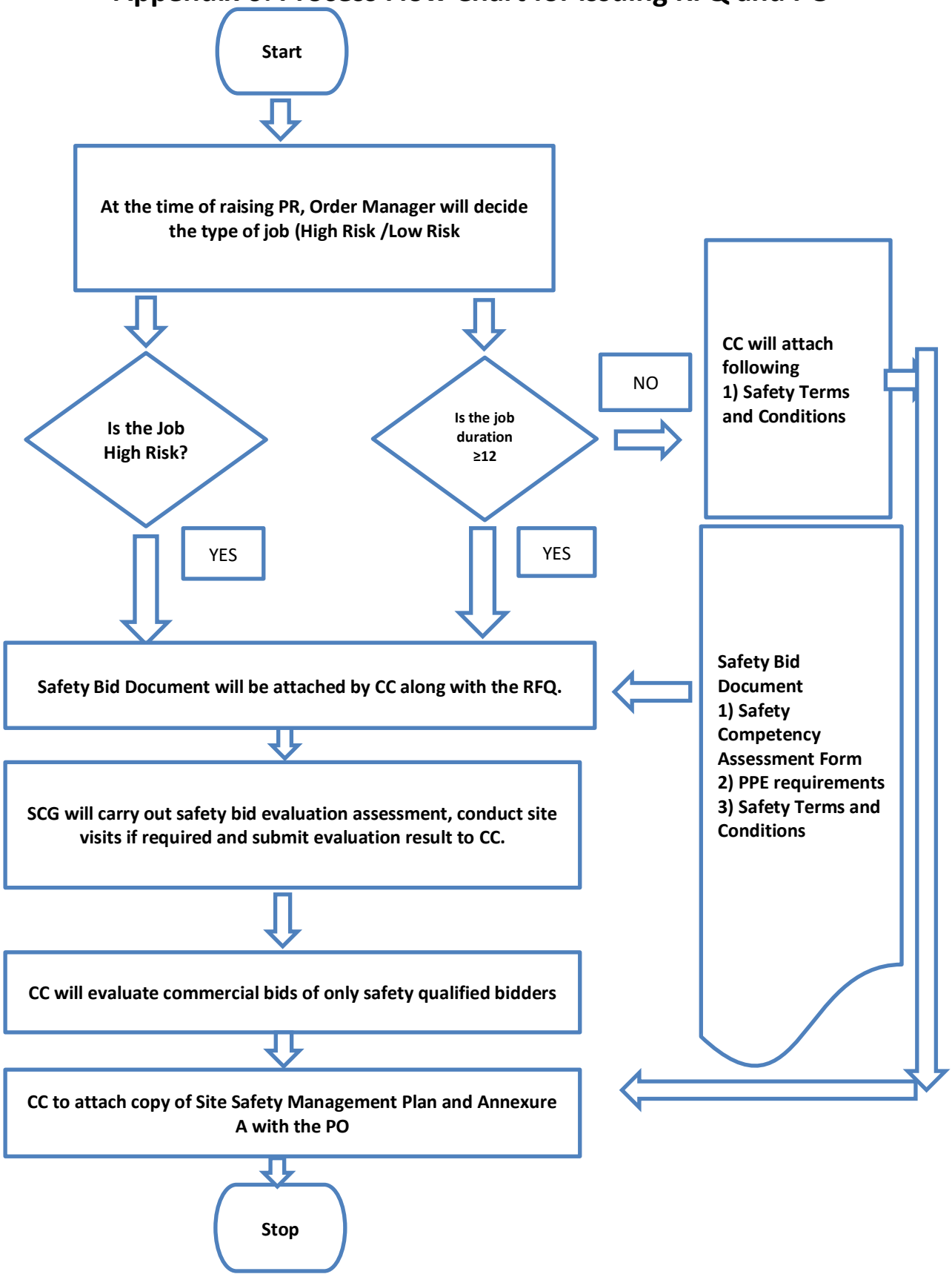
Sr No	Description of violation	Severity	Penalty
1.	Working without Permit	5	5000/-
2.	Untrained (TPSDI) worker on high-risk jobs.	5	5000/-
3.	Unhygienic/Bad condition of PPE	2	250/-
4.	Not following Tata Power Procedure & Standard	4	2000/-
5.	Unsafe Act/Condition of Severity 4	4	2000/-
6.	Unsafe Act/Condition of Severity 5	5	5000/-
7.	No Earthling of Electrical equipment	5	5000/-
8.	Damaged welding cable	5	5000/
9.	Violation of Positive Isolation Procedure (LOTO Not followed)	5	5000/
10.	ELCB of more than 30 mA/ELCB not working	5	5000/
11.	On/Off switch of welding m/c not working	5	5000/
12.	Electric cable tied with metal wire	5	5000/
13.	Leakage found DA hose / cylinder	5	5000/
14.	Use of LPG	5	5000/
15.	Use of IC engine based Three-wheeler at the work site.	5	5000/
16.	Starting the job without Toolbox Talk	5	5000/
17.	Spatter falling on DA hose / Gas-line/ pathways / Equipment	5	5000/
18.	No safety latch in crane hook	5	5000/
19.	Load raised or swung over people or occupied areas of buildings	5	5000/
20.	Persons standing in swing area of construction equipment.	5	5000/
21.	Using damaged slings.	5	5000/
22.	Unstable scaffolding/nonstandard Scaffolding in use	5	5000/
23.	Handrails and mid-rails are missing	5	5000/
24.	Safety Harness not anchored with lifeline/fixed structure	5	5000/
25.	Fall arrestor not provided/ Not being used.	5	5000/
26.	Double lifeline not used for working at height	5	5000/
27.	No rubber mat in Electrical Distribution (DB) room	4	2000/-
28.	Water found accumulated in Electrical Distribution room/near welding machine.	4	2000/
29.	Inserting electric cables into socket, without using plug.	4	2000/
30.	Use of damaged electrical cable/two core cables.	4	2000/
31.	Inflammable material found in Distribution Room / welding areas.	4	2000/
32.	Loose material falling into excavated pit	4	2000/
33.	Water logging into excavated pit /trenches	4	2000/

34.	No / inadequate Barricade	4	2000/
35.	Undercut / cave-in found on sides of excavated pits	4	2000/
36.	Grinding wheel/ Coupling/ Piling winch/other rotating parts without guard	4	2000/
37.	The HMV/Mobile Crane operator does not have a valid HMV driving license.	4	2000/
38.	The loading area is not leveled properly.	4	2000/
39.	Ladder not anchored at top	4	2000/
40.	Opening found in working platform of scaffolding/floor	4	2000/
41.	Inadequate illumination at the working area	4	2000/
42.	Loose material lying on Gantry, platform	4	2000/
43.	Cleaning with Compressed Air.	3	500/-
44.	Gas Cylinders using without cap.	3	500/
45.	Gas Cylinders stored without securing	3	500/
46.	Bringing inside any other chemicals, apart from approved by Safety dept.	3	500/
47.	Using drum for sitting or accessing height.	3	500/
48.	Misusing emergency facilities like fire hydrant line/ hose box/ spray system/ eye wash etc.	3	500/
49.	No provision of Safety net where falling materials or tools may occurs	3	500/
50.	Taking electrical supply from non-designated outlet (other than socket).	3	500/
51.	Restricted gangways due to unwanted materials.	3	500/
52.	Not reporting incident.	3	500/
53.	Entering into restricted area like switch yard/ hazardous storage	3	500/
54.	Work without supervision	3	500/
55.	Parking of vehicle without applying wheel choke at right front-front and left rear-rear wheels other than passenger cars.	3	500/
56.	Heavy Vehicle without helper or co-driver.	3	500/
57.	Not wearing florescent safety jacket at site.	3	500/
58.	People travelling in load body of vehicle.	3	500/
59.	Parking of vehicles at non designated area.	3	500/
60.	Shifting heavy materials without guide ropes.	3	500/
61.	Using other than 24V lamp inside the confined space/Use of other than 24V lamps.	3	500/
62.	Angular loading/ lifting with Crane or hoist.	3	500/
63.	By passing the limit switch/ Safety Interlock.	3	500/
64.	Housekeeping activities on road without proper barricade.	3	500/
65.	Trying to board or alit from running vehicle.	3	500/
66.	Cylinder Valves of Gas cylinders not closed when not in use.	3	500/
67.	Flash-back arrester not used.	3	500/

68.	Hand Trolley wheel found damaged.	3	500/
69.	Guy ropes of required length on both sides of object are not used during movement with load.	3	5/ 00/
70.	Scotch block/wedge not provided, when the vehicle is parked.	3	500/
71.	Suitable Trolley not provided to hold the cylinders.	3	500/
72.	Locked First Aid box	3	500/
73.	Caution boards, danger signs (luminescent /red) along with emergency contact number are not found displayed.	3	500/
74.	Person found jumping barricading tape	3	500/
75.	Stacking of pipes, pile casing, drums without chock blocks/wedges	3	500/
76.	The terrain on which Heavy Equipment/Machinery moves is not reasonably hard.	3	500/
77.	Without Safety Helmet at working sites	4	250/-
78.	Without Crash Helmet (on bikes)	4	500/-
79.	Without Full body double lanyard Safety Harness (for work at height)	5	5000/-
80.	Without Hand gloves - Material Handling, Welding, Cutting,	4	100/-
81.	Without Safety goggles/ face shield - Welding/Cutting /Grinding	5	5000/-
82.	Handling Chemical without PVC Apron	5	5000/-
83.	Smoking in prohibited area (Closed Go-downs, Storage of flammable material, Storage of Gas cylinders)	5	1000/-
84.	Sleeping at Workplace	3	100/-
85.	Driving beyond speed limit	3	1000/-
86.	Seat Belt While Driving (for front seat passengers and driver)	3	500/-
87.	Driving without license	4	1000/-
88.	Heavy Commercial vehicles without reverse horn	3	500/-
89.	Nonfunctional Head light/ taillight and side indicators	3	100/-
90.	Using Mobile Phone During Driving	5	5000/-
91.	Poor visibility of registration number/ without registration number	3	100/-
92.	Broken/ without Side view mirror	3	100/-
93.	Over speeding above specified limit	3	500/-
94.	Broken/ Without Pressure gauge on Oxygen/ LPG / Acetylene cylinder.	3	500/-
95.	Without Flash back arrestor on Industrial Acetylene & Oxygen cylinders.	5	5000/-
96.	Spillage of hazardous material/chemicals during transportation	4	2000/-
97.	Electrical equipment without Earthing/ ELCB/ Double Insulation Cable.	5	5000/-

98.	Lifting Tools & Tackles used without/ expired Test Certificates.	5	5000/-
99.	Housekeeping repeatedly not maintained		
100.	• First Time	3	Warning
101.	• Second Time	4	1000/-
102.	• Third Time	5	5000/-
103.	Serious Violation of House Keeping (after 1st or 2nd warning to be decided by Project Manager depending on the severity)	5	Rs.10000/- and above
104.	Repeat Violation of same nature	5	5 X Penalty for Violation
105.	Appointment of subcontractor without his Safety Bid Evaluation and/or without the permission of engineer in charge or Order manager.	5	5% of Contract Value

Appendix 6: Process Flow Chart for issuing RFQ and PO



Appendix 7: CSM-F-7 Safety Competency Form (Template)

Name of the Vendor/Bidder : -

Name of the Sub Vendor (If job is given to Sub Vendor) : -

Description of the Job : -

Request for Quotation (RFQ) No. :-

Vendor/Bidder to mandatorily provide the below safety competency related information.

1. Proposed Manpower Deployment Schedule : -

Category of Manpower Deployed	Minimum Qualification & Experience	Proposed Numbers against each category month-wise			
		Month 1	Month 2	…	Month n
Project Manager					
Site-In-Charge (Site Manager)					
Shift-in-Charge					
Safety Officers					
Supervisors					
Technicians					
a……					
b……					
Highly Skilled Workmen					
a……					
b……					
Skilled Workmen					
Semi-Skilled Workmen					
Unskilled Workmen					
Total Manpower					

Instructions to Bidder to fill:

1. Bidder to provide the overall site manpower deployment schedule as above.
2. Bidder to indicate (through colour code mentioned below) their direct and sub-contracted employees

Direct bidder employee
Partly Direct / Partly sub-contracted
Sub-Contracted

3. Against each of the category, bidder to indicate the minimum qualification and experience of the proposed manpower.
4. Rows can be added to also identify other specialised manpower e.g. specific details to be included for high risk activities operators
5. Columns can be extended to the actual duration of Site activities.
6. Bidder to note that if operations is in shifts, then Shift-in-charge / safety officers are required for each shift of operation.

2. List of Tools, Tackles, Machines and Equipment: -

Bidder/ Vendor to provide the list of tools, tackles, equipment **to be used during the job / project execution**. Bidder/Vendor to ensure that all the lifting tools and tackles, pressure vessels are duly certified by the competent person authorised by the Chief Inspector of Factories of the respective state prior to start of the job

Sr. No.	Description of Tools / Tackles	Capacity / Rating	Quantity	Make	Remarks
1					
2					
3					
4					
5					
6					
7					
...					

3. Safety Records:

Bidder to provide the details of fatalities and lost workday cases (LWDC), occurred in last three years (data to be provided for the last completed FY and preceding 2 years).

Description	Safety Data for Last 3 Years		
	Year 1 (Last FY)	Year 2	Year 3
	20__ - __	20__ - __	20__ - __
Fatalities (Nos.)			
Lost Workday Cases (Nos.)			

In case of no fatalities, LWDC during any year, the form may be filled stating NIL against the respective year. Bidders are encouraged to also submit the RCA / incident investigation reports and the learning's implemented out of the above reported incidents

4. Job Safety Plan/ Method Statement:

Bidder to provide / enclose a detailed Site/Job Safety Plan along with a Method statement detailing the execution philosophy (how the bidder intends to execute the Job/Project), identifying all key activities which are required to be performed by the contractor at Site. Bidder to also list down all high-risk activities and provide the Hazard Identification and Risk Assessment (HIRA) for all such high-risk activities involved in the site work.

(Use Method Statement template attached as annexure A and sample as attachment B)

5. Management System Certification: -

Sr.	Certification	Yes / No	If Yes, Year of Certification	If No, Target date for Certification
	ISO 9001			
	ISO 14001			
	OSHAS 18001 / ISO 45001			
	Any other (please specify……			
Note: Please attach certificates to support above. In case not accredited for above but applied for, application letters may be attached.				

Appendix 8: CSM-F-8 PPE requirements

The Contractor shall ensure that the following PPE of Approved standards shall be available at all time and shall be used by his employees with no exception whatsoever.

1	All contractor's employees at site	Safety Florescent Jacket (orange color), Safety helmet & safety shoes with Composite or steel toe cap
2	Workers mixing asphalt, cement, lime / concrete	Safety goggle & protective Hand gloves and footwear, Nose mask.
3	Welders / Grinders	Welding screen/goggles, safety shoes, leather hand gloves, aprons, leg guard
4	Stone breaker	Protective goggle, hearing protection, anti-vibration hand gloves and Protective clothing.
5	Electricians	Rubber hand gloves & Electrical resistant shoes.
6	Workers engaged in insulation using glass wool etc.	Respiratory mask & leather Hand gloves, goggles.
	Workers engaged in coal handling plant, ash handling plant and working in high dust area.	Dust mask, Hand gloves, protective goggles.
7	Workers working at a height of 1.8 Meter or above.	Double lanyard full body harness, fall arrestor and safety net made of reinforced nylon fiber ropes firmly supported with steel structures

• **PPE shall be conforming to BIS/DGMS/DIN specifications, in good condition and shall be comfortable to his employees, when used.**

Appendix 9: CSM- F-10 Site Safety Management Plan / Method Statement

Site Safety Plan / Method Statement (Template)

This Method Statement describes the specific safe working methods which will be used to carry out the described work. It gives details of work procedure with control measures to counter health and safety issues related to this work. The listed content of this Method Statement can be changed/modified subjected to job scope / specifications, but task specific method statement once finalized & approved, that should not be modified during work execution without permission from the approving authority.

Project/Job Name			
Scope of work: -			
Drawing References: -			
Detail of Sub contractors involved: -			
Method Statement Prepared By: - Designation: - (e.g. Site Manager)		Signature	Date

1.0 Introduction (*Describe purpose of the work, give details of type and scope of work being carried out);*

2.0 Location of Work (*Give site address and precise location on site where work is to be carried out.)*

3.0 Safety Document /Specific Approval Required (Details of any safety documents or specific approval i.e. Client specific approval required to undertake the work)

5.0 Role & Responsibilities of Personnel/Parties Involved in activities: -Clearly define role and responsibilities of all personnel involved in activity i.e. Site management staff including subcontractors' parties- Main contractor Project/Site Manager, Sub Contractor Site Manager, Project Engineer, Safety officer, Competent Supervisory Staff)

6.0 Working/Activity Description: - It *is important that all operatives should have clear idea of those operational sequences and responsible supervisor must verify their competency prior to their engagement in operation.*

6.1 Pre-Working Checks

6.2 Resources (Equipment, tools including manpower) Details *i.e. Equipment and Tools, specific operational equipment, test kits, lifting resources, Details of materials to be used in operation, including any reference to COSHH assessments in case of use of any chemicals, Details of the manpower allocated to the task, e.g. titles, qualifications, competences, direct manpower, contractors. Details of plant, tools and equipment to be used for the work, including the availability of relevant statutory documents, checks or inspections etc. Details of fencing, barriers, cones, chains, dangers notices, warning signs etc.*

Tools required for work:

Sr.No	Tools /Equipment /Machine	UOM	Required Qty.	Remark
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

6.4 Operational Sequence of work: - *Full description of the work, setting out the methodology in a sequential manner, including any reference to any identified operational restraints. Also refer here sec. 5.0 responsibilities part for every step of work sequence).*

Sr.No	Activity	Details of job sequence	Risk Involved	Control Checks
1.		1.		
2.				
3				
4				
5.				

6.7 Final Checks & restoration of work area after completion of work :- *Those checks to be carried out by responsible supervisor in witness of his line hierarchy by use of specific checklist of certain operational checks and once those completed satisfactory, PTW (if applicable) to be closed and isolation arrangements to be restored by removing barricades/cautionary tags.*

7.0 Task Specific Hazards: - *Refer to Task Specific Risk Assessment and attach in appendix*
Attachment: - Specific Risk Assessment
In addition, please provide below control measures in risk assessment *(as applicable).*

Fall Protection Measures: (Where Work at height cannot be avoided)							
Control Measures for Electrical Hazards							
Others Hazard if any (please provide details)							
Hazardous Substances to be used in job : (Attach MSDS if required)	 Acute Toxic	 Health Hazard	 Corrosive	 Dangerous For the environment	 Oxidising	 Highly flammable	 Explosives
	Yes /No	Yes /No	Yes /No	Yes /No	Yes /No	Yes /No	Yes /No

7.0 Emergency Provisions: -*Relevant operational possibility of a programme in the case of emergency situation i.e. electrical supply restoration. In addition emergency response provisions i.e. first aiders, fire fighting, and first aid arrangements, nearest onsite/offsite emergency response also to be considered during emergency planning.*

8.0 "5S issues" / Waste Disposal/ Housekeeping and Environmental issues: -*Details waste disposal processes and or housekeeping activities, Details of environmental impacts and control measures.*

9.0 Personal Protective Equipment (PPE):- (*Tick on PPE requirements for the task/Job*

Required Personnel Protective Equipment:	 Safety Boots	 Hard Hats	 Safety Gloves	 Hearing Protection	 Eye Protection	 Respiratory Protection	Other: 1. Hi-Viz 2. Coveralls 3.

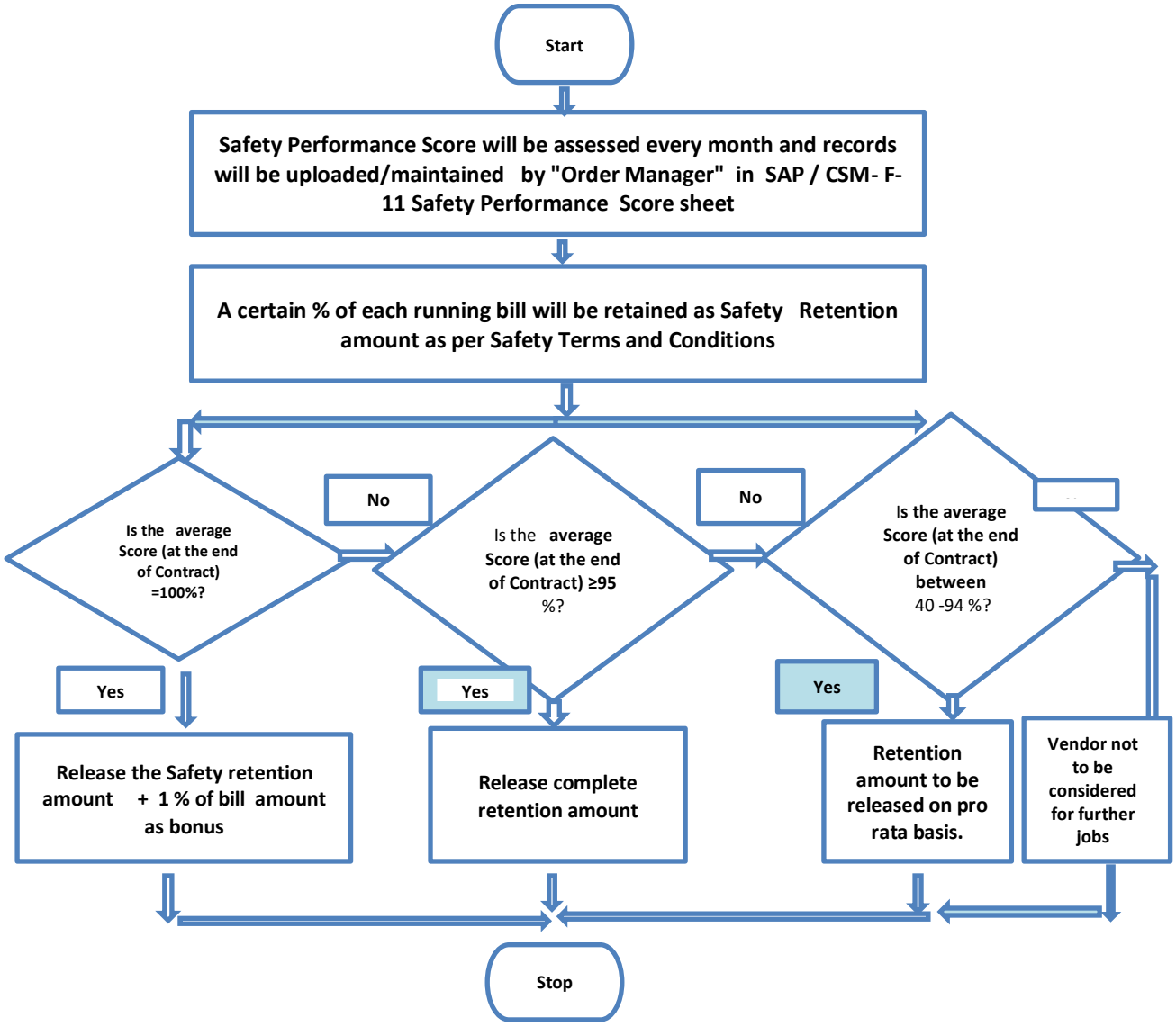
10.0 First Aid facilities and Nearby Hospitals Details

 First Aid Facilities:	Name of On-Site First Aider:	
	First Aid Box Location:	
	Location of Nearest Hospital:	

11.0 Occupational Health, Fitness and COVID-19 related Preparedness:

1. Please give a brief writeup / methodology of your organization planned to avoid impact of the COVID-19 pandemic at Tata Power working site. 2. Please give brief details of occupational health and hygiene related interventions planned by your organisation to ensure good health and fitness of workforce at Tata Power site.

Appendix 10: Process Flow Chart for Safety Performance Evaluation



Appendix 11: CSM- F-11 Safety Performance Score

Sr. No	Parameter	Unit of Measurement	Target	Weightage	Actual Performance	Actual Score
Lead Indicator						
1	% of Employee certified in TPSDI/Authorized agency	Number	50%	10		
2	CFSA score (Annexure 6.1)	Average Severity of Violations	1.49	20		
3	Monthly inspection completed for Critical Equipment, lifting Tools & Tackles and hand tools used at site	Number	80%	10		
4	Condition of critical tools, tackles and equipment	Number	100%	10		
Lag Indicator						
1	Number of Fatalities	No	0	30		
2	Number of Lost workday case (LWDC) (reportable)	No	0	10		
3	Man-days Lost	Man-days	0	10		
					Final Score	
					Invoice Value	
					Amount to be released	

Safety Performance Evaluation Criteria

Lead Indicators

	Target			
% of Employee certified in TPSDI/Authorized agency	50%	100%	Less than 100%	
Score		10	5	
	Target			
CFSA score	<=1.49	1.5 to 2.5	2.51 to 3.5	>=3.51
Score	20	15	10	0
	Target			
Monthly inspection completed for Critical Equipment, lifting Tools & Tackles and hand tools used at site	>=80%	79 to 50%	<50%	
Score	10	7	0	
	Target			
Condition of critical tools, tackles and equipment	100%	<100%		
Score	10	0		

Lag Indicators

Number of Fatalities	0	>0	
Score	30	0	
Number of LWDC (reportable)	0	>0	
Score	10	0	
Number of man days lost	0	1 to 5	>5
Score	10	5	0

Appendix 12: CSM-F-5 Safety Potential Evaluation Criteria for Vendor Registration

At the time of vendor registration, vendor will be registered under 3 categories

1) **Category A**- Vendors eligible to carry out High risk Jobs
2) **Category B**- Vendors eligible to carry out technical jobs that are low risk
3) **Category C**- Vendors eligible to carry out administrative and office jobs
4) **Category D**- Outsourced Jobs / Consultants /Medical Practitioners / Suppliers etc

For vendors to be registered under **Category A**, a safety potential evaluation will be carried out based on following parameters.

Sr. No	Description	Weightage (%)	Actual Score	Remarks
1	Does the contractor have a valid ISO 45001/ OHSAS 18001/ Certification?	30		
2	During site visit check for safety adequacy at site	30		Annexure - 12.1
3	Check the Safety statistics of Contractor	10		Annexure - 12.2
4	Check the Safety orientation & training process of Contractor	15		Annexure 12.3
5	Check the organizational structure for safety professionals & engineers / supervisors.	10		Annexure - 12.4
6	Certified/skilled workers as a percentage of overall workforce	5		
	Total	100		

Evaluation Criteria for Category B

Sr. No	Description	Weightage (%)	Actual Score	Remarks
1	Does the contractor have a valid ISO 9001 certification?	30		
2	During site visit check for safety adequacy at site	30		Annexure -12.1
3	Check the Safety statistics of Contractor	10		Annexure -12.2

4	Check the Safety orientation & training process of Contractor	15		Annexure -12.3
5	Check the organizational structure for safety professionals & engineers / supervisors.	10		Annexure -12.4
6	Certified/skilled workers as a percentage of overall workforce	5		
	Total	100		

Evaluation Criteria for Category C

Sr. No	Description	Weightage (%)	Actual Score	Remarks
1	Does the contractor have a valid ISO 9001 certification?	40		
2	Check the Safety statistics of Contractor	40		Annexure - 12.2
3	Check the Safety orientation & training process of Contractor	20		Annexure - 12.3
	Total	100		

Annexure 12.1: Evaluation Criteria for Category D:

Category D does not require any evaluation as it is for outsourced job outside the Tata Power company premise.

Annexure 12.2

Check List – Adequacy of Safety Statistics of Service Provider			Actual Marks obtained	Remarks
1	Check the safety statistics for last 3 years (LTIFR and LTISR)	Statistics available: Marks 5; Statistics not available: 0		
2	Check the trend LTIFR for last 3 years	LTIFR value: 0 to 0.2 – Marks 5; 0.21 to 0.3 – 2.5; >0.3 – 0		
3	Check the trend of LTISR last 3 years	LTISR value: 0 to 2 – Marks 5; 2 to 3 – 2.5; >3 – 0		
4	Has there been any Prosecution/Conviction for any contravention with regard to Safety & Health provisions under the Factories Act /Electricity Act/ BOCW Act and Rules framed there under?	Marks: No Prosecution 10; Prosecution 0. To be provided in written on letter head		
	Total	**25**		

Annexure 12.3

Check List – Adequacy of Safety orientation & training process of Service provider			Actual Marks obtained
1	Records of safety trainings provided to safety officer/supervisor/workmen during last 1 year as percentage(%) of total employed by service provider	**Safety Officer** / Marks ≥80% of employees / 5 50 to 79 % of employee / 2.5 < 50% / 0 **Safety Supervisor** / Marks ≥80% of employees / 10 50 to 79 % of employee / 6 < 50% / 0 **Workmen** / Marks ≥80% of employees / 10 50 to 79 % of employee / 6 < 50% / 0	
	Total	25	

Annexure 12.4

Check List – Adequacy of organizational structure for safety professionals & engineers / supervisors.			Actual Marks obtained
1	Check availability of number of safety officers from government recognized institute as per workforce strength.	Marks 1 in 50 employees / 10 1 in 100 employee / 6 Any other / 0	
3	Check availability of qualified workforce from government recognized institute/TPSDI.	Marks 100% of safety officers qualified / 5 50 – 99% of safety officers qualified / 3 <50 / 0	
	Total	15	

Appendix 13: CSM-F-9 Safety Bid Evaluation Criteria.

The User has to select whether the job is high risk/ long duration at time of raising the PR.

1) The decision whether job is "**high risk** "or not has to be made by order manager on the basis of Risk involved (Risk Priority Number in HIRA) of the Jobs. An indicative list of high-risk jobs is attached as annexure
2) If a technical job is of low risk with estimated duration of the contract is 1 year or more the job should be treated as "**long duration**".
3) All Safety bids will be evaluated by Safety Concurrence Group. Structure of SCG will be declared by Corporate safety. Corporate safety team will audit bid evaluation process of a few selected jobs and Quality of evaluated safety Bids.
4) Records of jobs sent by for Safety Bid evaluation shall be maintained by Corporate Contract team in existing tracing sheet along with other jobs.
5) For Safety Bid Evaluation will be based on following parameters.

		Minimum Requirement	**Weightage (%)**	**Score Obtained**
Manpower	**Safety Officer (1 per 500 workers)**	**Qualification-** Officer shall possess Advance Diploma In Industrial Safety by state technical board. **Experience**- Minimum 1-year experience in relevant field as mentioned in the job in PR.	5	
	Safety Supervisor (1 per work site up to max. 50 workers)	**Qualification-** Supervisor shall possess ITI/ Diploma in relevant field. **Experience**- Minimum 2-year experience in relevant field as mentioned in the job in PR. **Training** – Trained and certified by TPSDI or equivalent institute in relevant safety procedures. **Note:** On request of the contractor/Users -TPDSI should vet & certify the skilled & experienced	5	

		Technician if Technical Qualification is not adequate.		
	Technician (Skilled workers as electrician, rigger, fitter, welder, cable jointer, line men etc)	**Experience**- Minimum 2 year experience in relevant field as mentioned in the job in PR. **Training** – Trained and certified by TPSDI or equivalent institute in relevant safety procedures.	5	
Tools & Tackles	Equipment / Machines/ Tools & Tackles(lifting and shifting tools)	The list of Equipment /Machines / Tools and tackles to be used for job to be submitted by the contractor. Evaluation of the list will be carried out based on 1) Suitability as per the relevant job 2) Make and age of the tools from authorized agencies defined by the user. 3) Certification by the competent authority of respective state.	30	
Safety Records	Safety Records	Safety Records for last 3 years (as per vendor or as per our knowledge) – Recommendation?	15	
Safety Plan	HIRA/Contract Job Safety Plan	Adequacy of HIRA and Job Safety Plan with respect to relevant job. More weight age will be given to vendor for using mechanized work and advanced tools and equipment	20	
Accredited Bodies certificate	ISO-9001	ISO-9001	2	
	ISO-14001	ISO-14001	3	
	OHSAS 18001 ISO 45000	OHSAS 18001/ISO 45000	15	
		Total Score		

6) Vendor entitled to carry out the job only when qualified for the safety evaluation as follows:

Contractor is qualified in safety bid only if his total score is more than 70% in all category 1 jobs such as high risk/long duration.

7) The Corporate Contract has to ensure that the vendor provides the filled "Safety Competency Form" along with the quotation.
8) Corporate Contract will forward the Safety Competency Form received from the contractor to the Safety Concurrence Group for evaluation.
9) In case SCG wants to visit the site, the Safety Competency will be based on evaluation at the time of site visit Annexure 13.1

Annexure -13.1:

Checklist to be used: During site visit to check the adequacy Safety systems.			
		Observation	Score* (1-5)
1	Check the adequacy of safety policy and Safety Management system of the contractor.		
2	Does the contractor have written down safety procedures?		
3	Check the records of Near miss, unsafe act, unsafe conditions and incidents.		
4	Check the organization setup to implement the safety systems at site (safety officer, safety supervisor)		
5	Check whether safety meeting and toolbox talk carried out regularly and records maintained or not.		
6	Is the process of incident investigation adequate or not?		
7	Verify incident reporting and recording system		
8	Check the usage of equipment/tools and tackles.		
9	Check for housekeeping at site		
10	Check the use of PPEs and general behavior of workforce towards safety		
	Total Score		
	Site Visit Score		

Score*- rating on the scale of 1-5 to be given based on the observations on site. Score of 1 is the lowest and core of 5 is the highest.

Appendix 14: CSM-F-11.1 CFSA Format

CONTRACTOR FIELD SAFETY AUDIT

Project Name :

Date:

Description of Severity rating:		**Audit Team:**	
	1 = Untidy area, minor issues, sets poor example		
	2 = Restricted access, unacceptable trash, disorderly		
	3 = Rule or procedure violation, potential injury		
	4 = Unsafe condition, serious injury potential		
	5 = Immediate serious injury potential, stop activity immediately and correct	**Audit Time:**	10:00hrs -11:30 hrs
		Weather:	cloudy

		Responsible		**Number Personnel Observed**		**Violations**			**Remarks**	Leading Indicators			
	Description	**Engineer**	**Contractors**	**Good Citizens**	**Violators**	**Number of Violations**	**Severity**	**Violations x Severity**		4 & 5	PPE	Unsafe Act	Unsafe Condition
Area													
1													
	Sub Totals			**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**
	% of Observed People Working Safely												
	Number of Violations												
	Average Severity of Violations												
	Number of Severity 4 & 5 Violations												
	% of 4 & 5 Violations												
	Approximate Number of Workers Observed												
	Number of People on Site												
	% of Workers Observed												

Appendix 15: Indicative List of High-Risk Jobs

To access the exhaustive list of High-risk jobs, please refer the following documents

1) High Risk Jobs- Generation
2) High Risk Jobs- T&D
3) High Risk Jobs- Renewable

Indicative List of High-Risk Jobs -Generation Cluster					
Sl. No.	**Jobs**				
1	Demolition / Painting of Chimney				
2	Survey Sounding Jobs in Sea				
3	Dredging at Coal Birth Jetty				
4	Maintenance / Testing and Replacement of Extra High Voltage (132 KV etc.) Switchyard equipment				
5	Maintenance of EOT Cranes				
6	Deep excavation (5 feet or more) near existing buildings /Structure s				
7	Working inside confined spaces (entry through manhole)				
8	Operation Maintenance of elevators				
9	Working on Live control Circuits for identification of faults				
10	Cable laying and termination Jobs				

Indicative List of High-Risk Jobs - T&D Cluster					
Sl. No.	**Jobs**				
1	Transmission Line Tower Erection on columns, near live lines, In congested areas, In creeks, In the Sea				
2	Conductor Stringing on Tower Using Tensioner & Puller in the area such as Line Crossing, Near Live lines, Congested Areas, Road Crossing, Bridge Crossing, Railway line Crossing, In creeks ,In the Sea				
3	Cable Pulling by Using winch Machine in City and Rural Areas				
4	Hot Washing of HT and Extra HT lines, Towers and switchyards equipment				
5	Installation of Lifts				
6	Installation of EOT Cranes				
7	Tower Dismantling				
8	Working on H Frame /Pole mounted Transformers				
9	Excavation in operational Area heaving power cables in receiving station				
10	Identification and spiking of cable / disconnection of cables from poles				

Indicative List of High-Risk Jobs - Renewable Cluster					
Sl. No.	**Jobs**				
1	Working on Electrical Panels				
2	Hi Potting of Equipment				
3	Battery commissioning and maintenance				
4	Working on the nasal of Wind Turbine				
5	Working on live electrical switchyard, material Handling and Equipment installation				
6	Roof Top Solar Panels Installation and maintenance				
7	Working in live Electrical Switchyard, Material Handling, equipment installation				
8	All maintenance activities that requires climbing on Towers /Structures / Transformer/ GODs				
9	Loading and Unloading of Solar Panels on trucks				
10	Structural Repair /Dismantling work at height.				

Annexure IX

Tata Code of Conduct (TCoC)

TATA CODE OF CONDUCT

The Owner abides by the Tata Code of Conduct in all its dealing with stake holders and the same shall be binding on the Owner and the Contractor for dealings under this Order/ Contract. A copy of the Tata Code of Conduct is available a tour website:

https://www.tatapower.com/pdf/aboutus/Tata-Code-of-Conduct.pdf

The Contractor is requested to bring any concerns regarding this to the notice of our Chief Procurement & Stores e-mailID: pravin.jain@tpcentralodisha.com.

Annexure X

Environment & Sustainability Policy

ENVIRONMENT & SUSTAINABILITY POLICY

CORPORATE ENVIRONMENT POLICY

Tata Power is committed to a clean, safe and healthy environment, and we shall operate our facilities in an environmentally sensitive and responsible manner. Our commitment to environmental protection and stewardship will be achieved by:

- Complying with the requirements and spirit of applicable environmental laws and striving to exceed required levels of compliance wherever feasible
- Ensuring that our employees are trained to acquire the necessary skills to meet environmental standards
- Conserving natural resources by improving efficiency and reducing wastage
- Making business decisions that aim towards sustainable development
- Engaging with stakeholders to create awareness on sustainability

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER
Lighting up Lives!

CORPORATE SUSTAINABILITY POLICY

At Tata Power, our Sustainability Policy integrates economic progress, social responsibility and environmental concerns with the objective of improving quality of life. We believe in integrating our business values and operations to meet the expectations of our customers, employees, partners, investors, communities and public at large

- We will uphold the values of honesty, partnership and fairness in our relationship with stakeholders
- We shall provide and maintain a clean, healthy and safe working environment for employees, customers, partners and the community
- We will strive to consistently enhance our value proposition to the customers and adhere to our promised standards of service delivery
- We will respect the universal declaration of human rights, International Labour Organization's fundamental conventions on core labour standards and operate as an equal opportunities employer
- We shall encourage and support our partners to adopt responsible business policies, Business Ethics and our Code of Conduct Standards
- We will continue to serve our communities:
  - By implementing sustainable Community Development Programmes including through public/private partnerships in and around our area of operations
  - By constantly protecting ecology, maintaining and renewing bio-diversity and wherever necessary conserving and protecting wild life, particularly endangered species
  - By encouraging our employees to serve communities by volunteering and by sharing their skills and expertise
  - By striving to deploy sustainable technologies and processes in all our operations and use scarce natural resources efficiently in our facilities
  - We will also help communities that are affected by natural calamities or untoward incidence, or that are physically challenged in line with the Tata Group's efforts

The management will commit all the necessary resources required to meet the goals of Corporate Sustainability.

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER
Lighting up Lives!

SUPPLIER MANUAL ANSWERING

TO

E-BIDDING & E-AUCTION

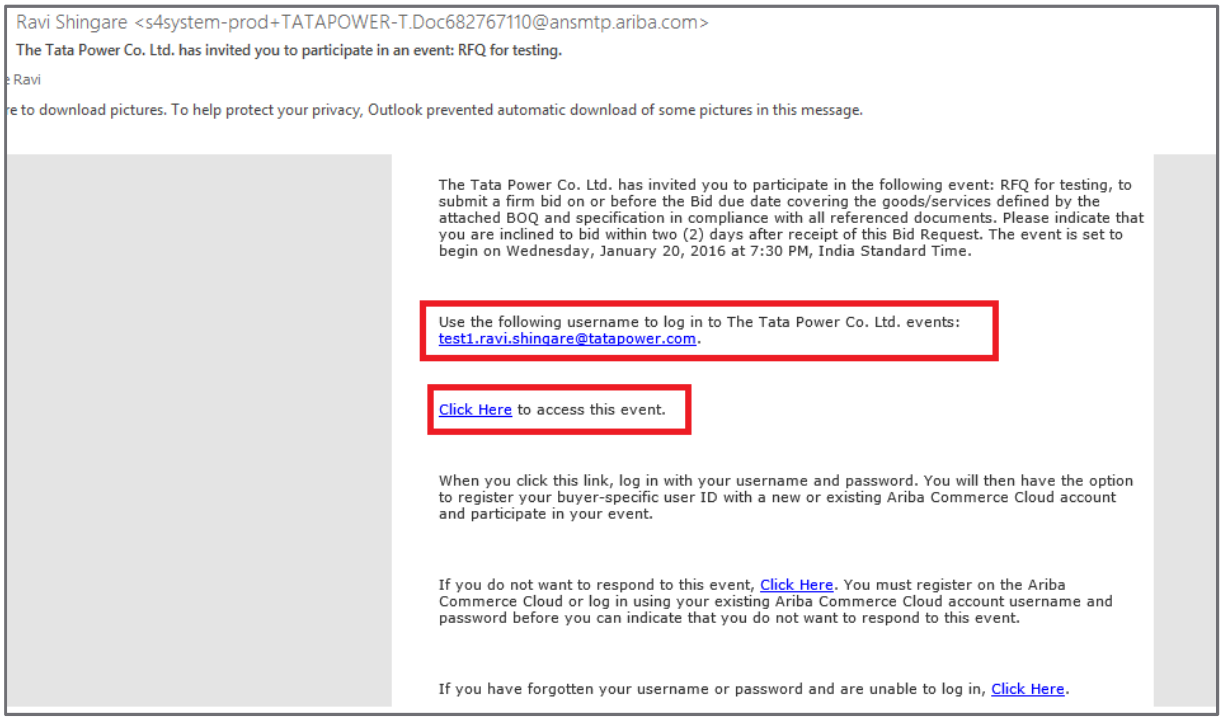
	Version 1.1
Company Confidential	DEC - 2016

INDEX

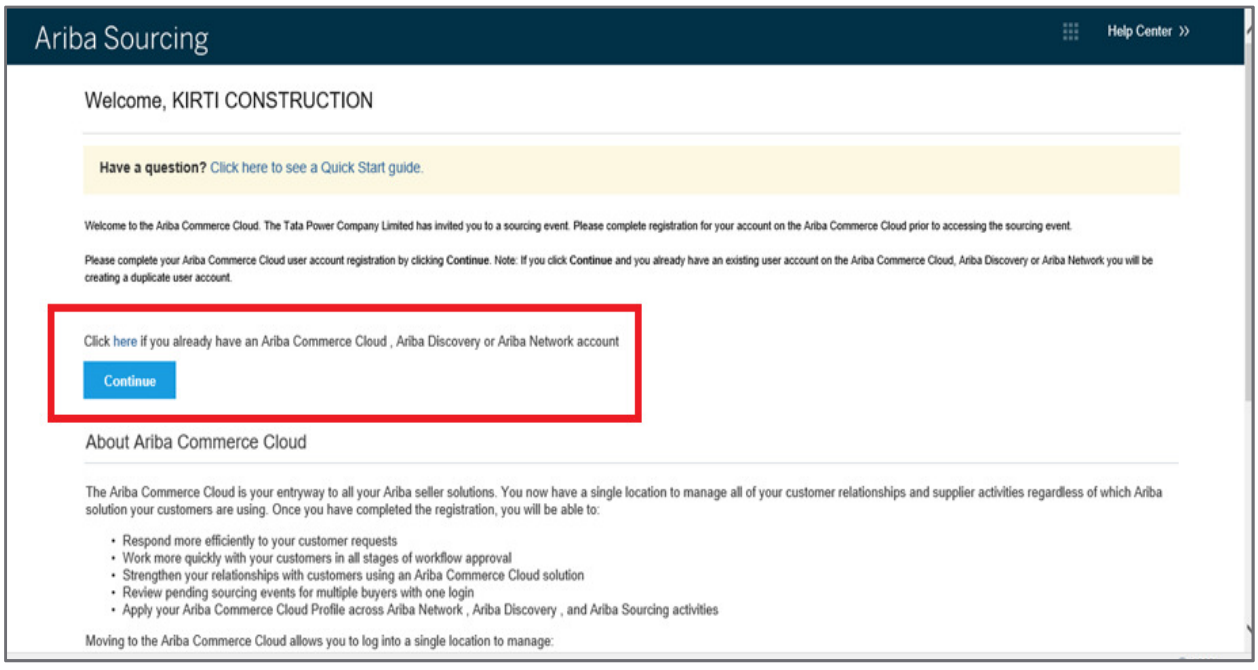
1- Accessing Ariba Sourcing

Step 1: You will get an invitation to your email from Ariba System. Keep this email, it contains your login Information and a direct link to Ariba.

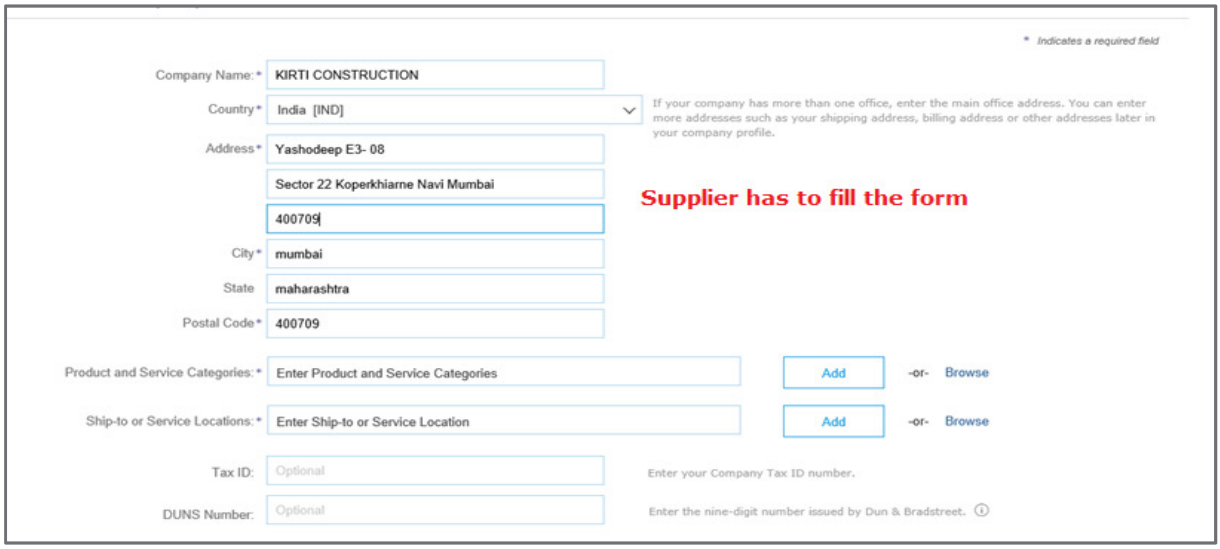
Step 2: Click “Click Here” to access the Ariba Web Site.



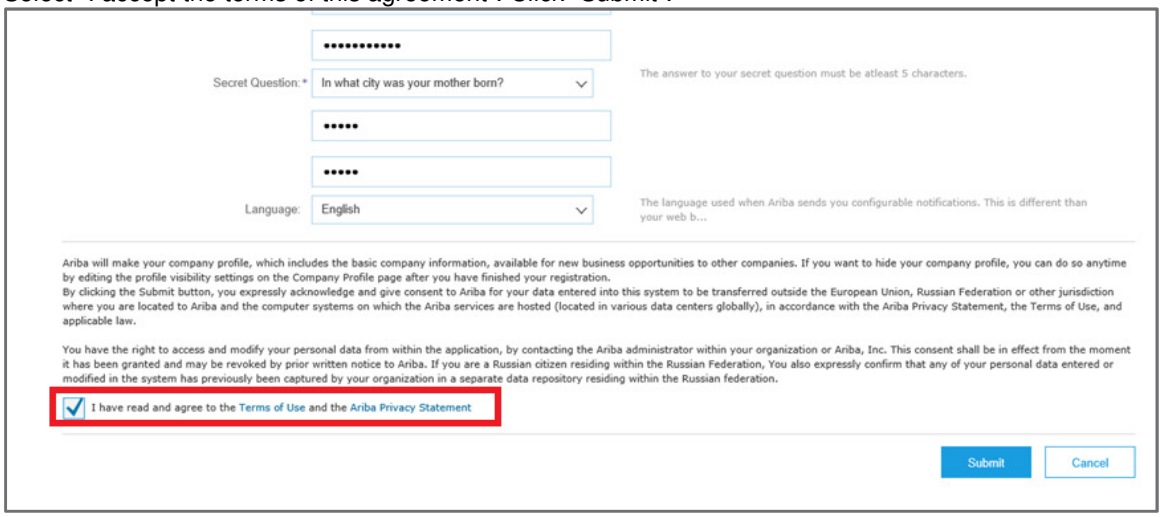
Step 3: Supplier has to click on "Continue"



Step 4: The registration process only takes a few moments, with a simple one-page registration Define your password and secret question. Click “OK”



Step 5: If it’s the first time you are invited to use UPM Ariba, you’ll need to accept the “Participant Terms”. Select “I accept the terms of this agreement”. Click “Submit”.

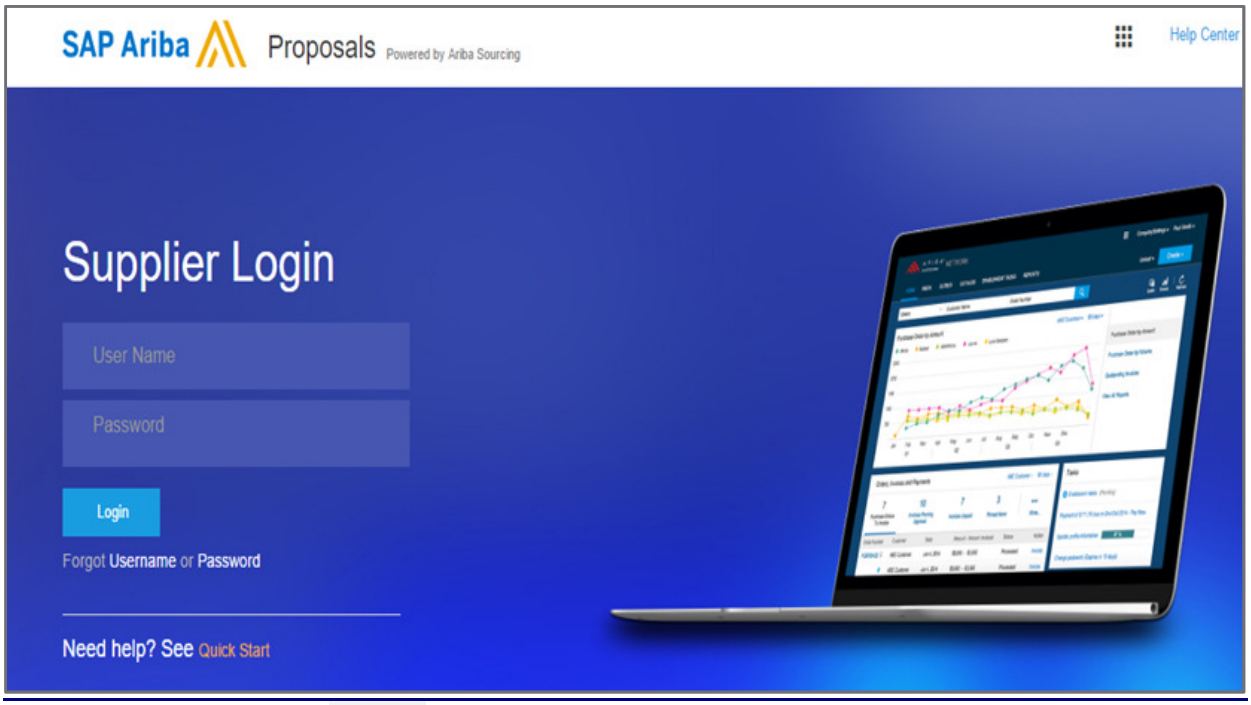


2 Vendor Screen

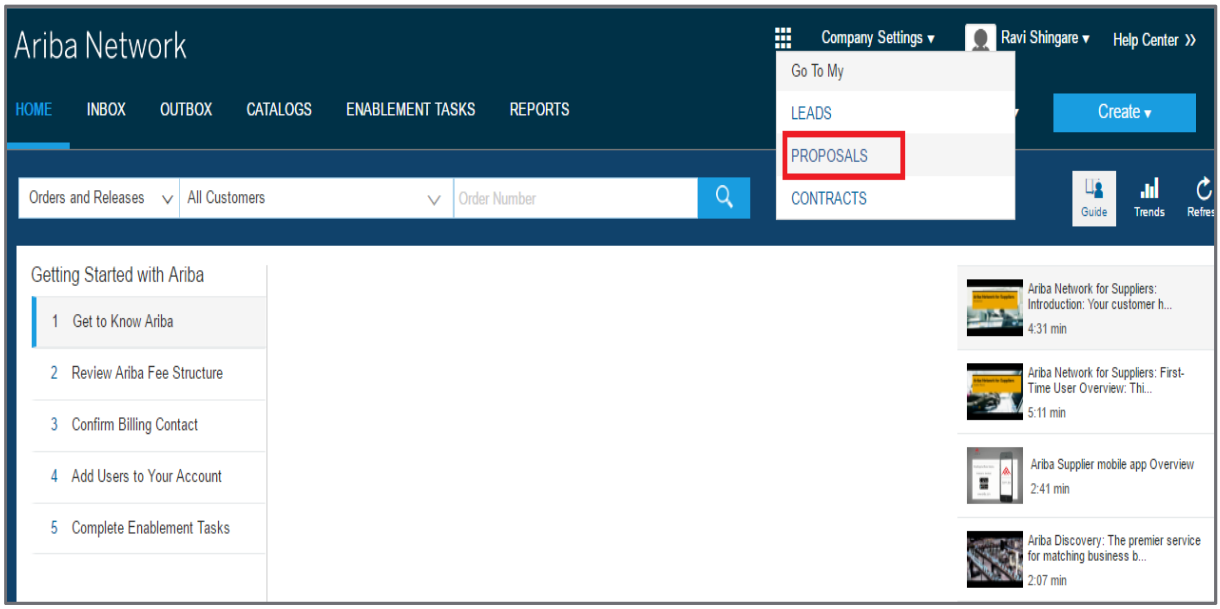
2.1.1 If vendor goes through mail invitation then directly Screen 3.1.1 will appear, but if If you have used Ariba before and have already accessed an event for the buyer-specific account with your current log in ID, click the **Login** button to continue. Log in with your Ariba username and password in order to participate in the event OR you have to follow the following steps.

Step 1 - Log on **supplier.ariba.com**

Step 2 - Put your USER ID and Password in following screen



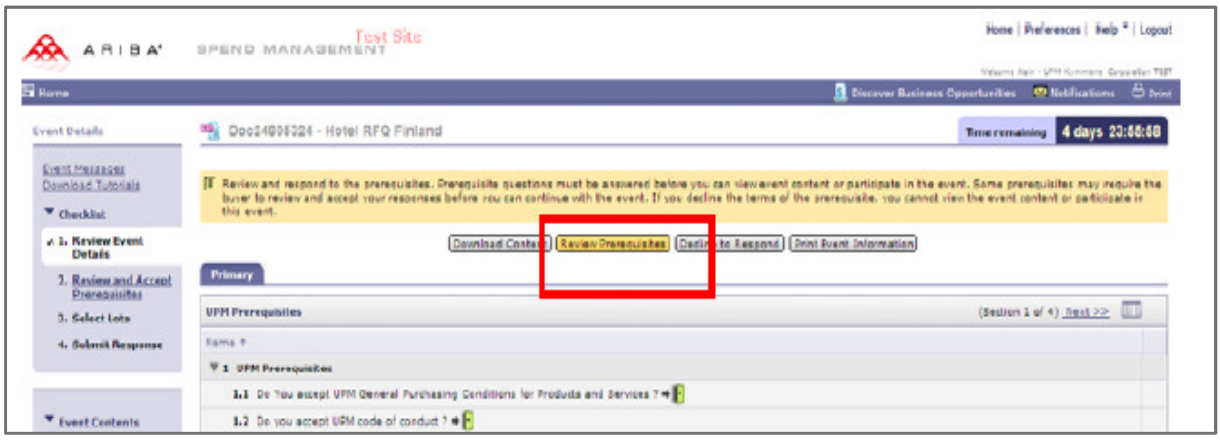
Step 3 - Go to ARIBA APPS  and click on Proposals.



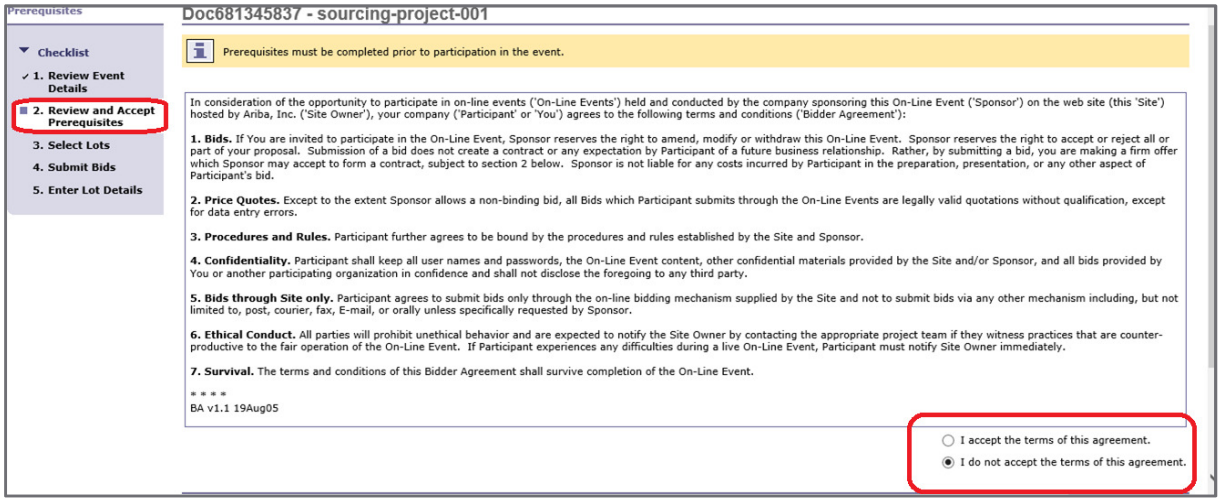
3 Submitting Your Answers / Proposal

3.1.1 Review and Approve “Prerequisites”

Step 1: Review and download all documents & then Click on “Review Prerequisites”



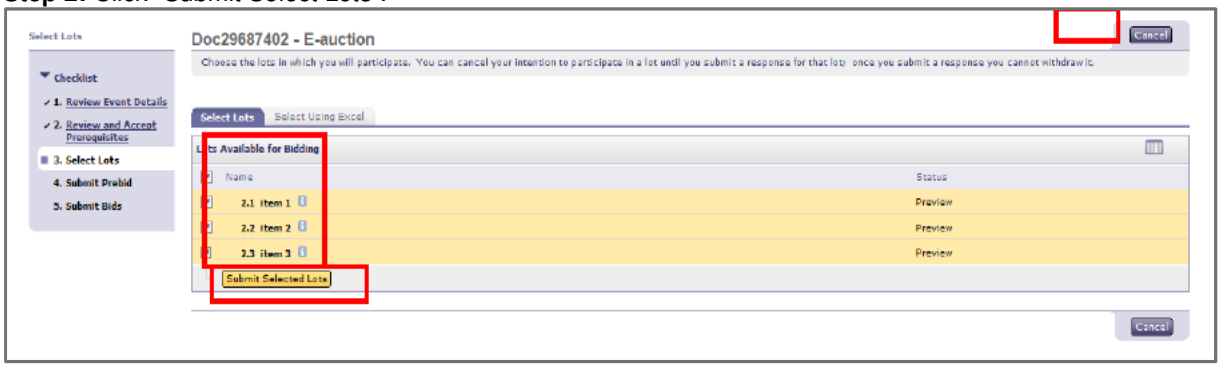
Step 2: Review and accept “Bidder Agreement”.



3.1.2 Select Items or Lots

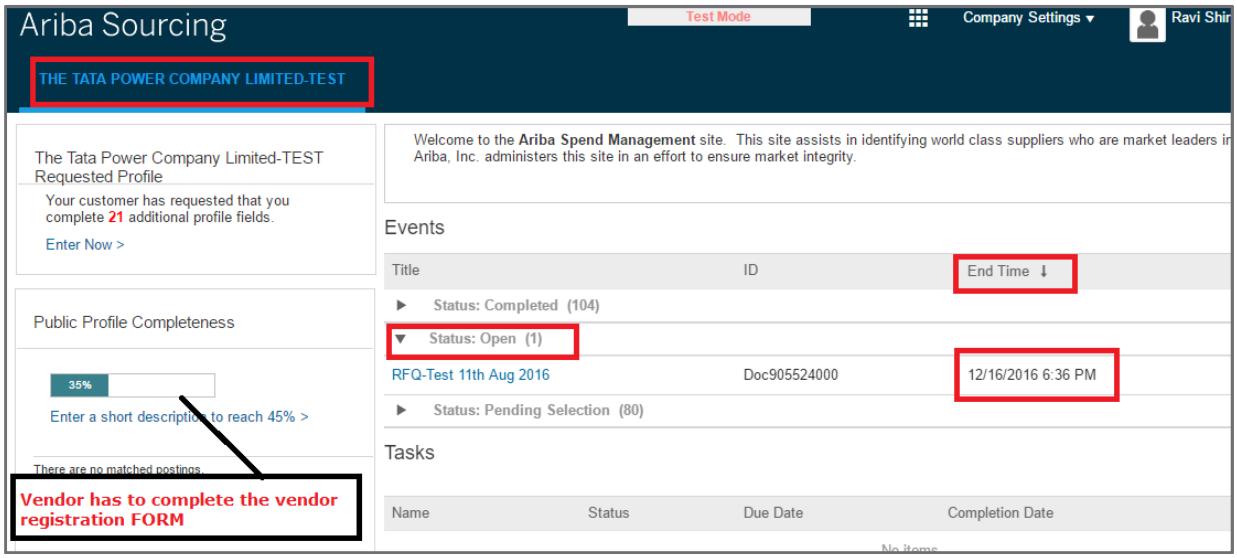
Step 1: Select Items. - If you do not want to quote for any items/lots then you do not select that lot / items and then go ahead for select and submit lot.

Step 2: Click “Submit Select Lots”.



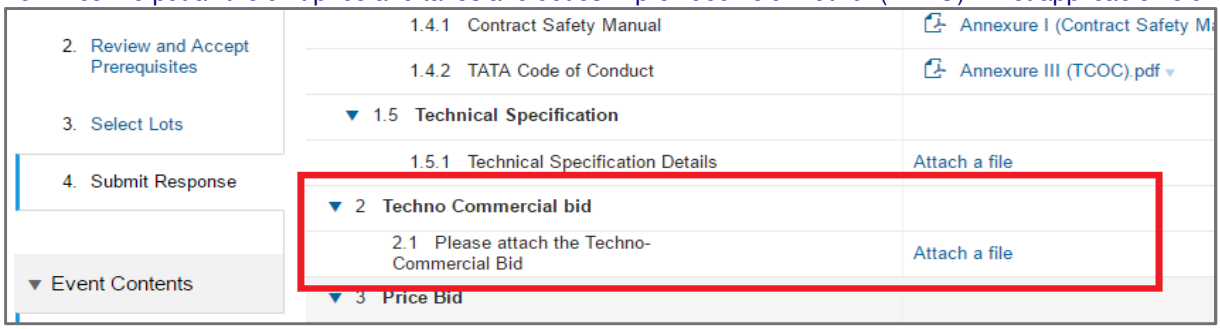
3.1.3 Entering your offer for RFQ

Step 1: as per following screen Vendor Dashboard will appear where RFQ from TATA Power will be visible.

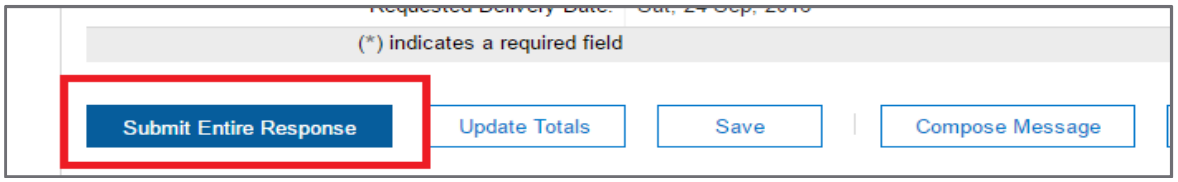


Step 2 - Follow all the steps of 3.1.1 to 3.1.3

Step 3 - Vendor has to submit their techno commercial offer in 2.1. In this field Do No attach any price content. For Price Bid put all the unit price and taxes and duties in provided field. Put "0" (ZERO) in not applicable field.



Step 4 - After successfully putting Techno commercial offer and price part then click on "Submit Entire Response"

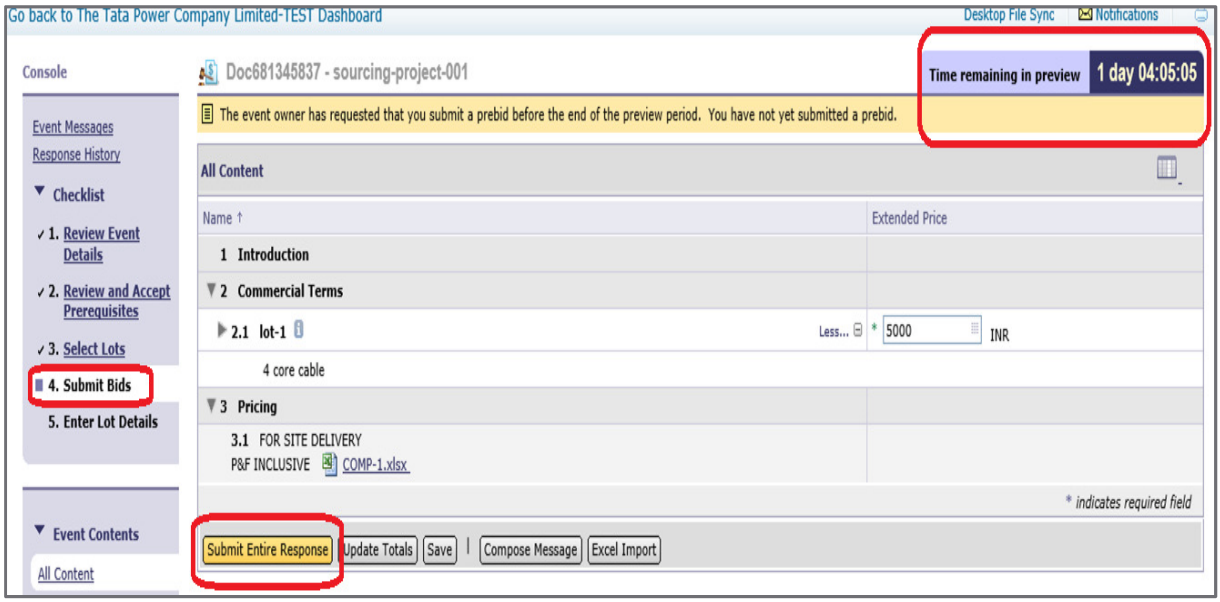


3.1.4 Entering Your Prebid for e-auction

Before participation to the e-auction you must place a pre-bid. If you haven't placed a Prebid in the Prebid time you won't be able to participate to the auction itself.

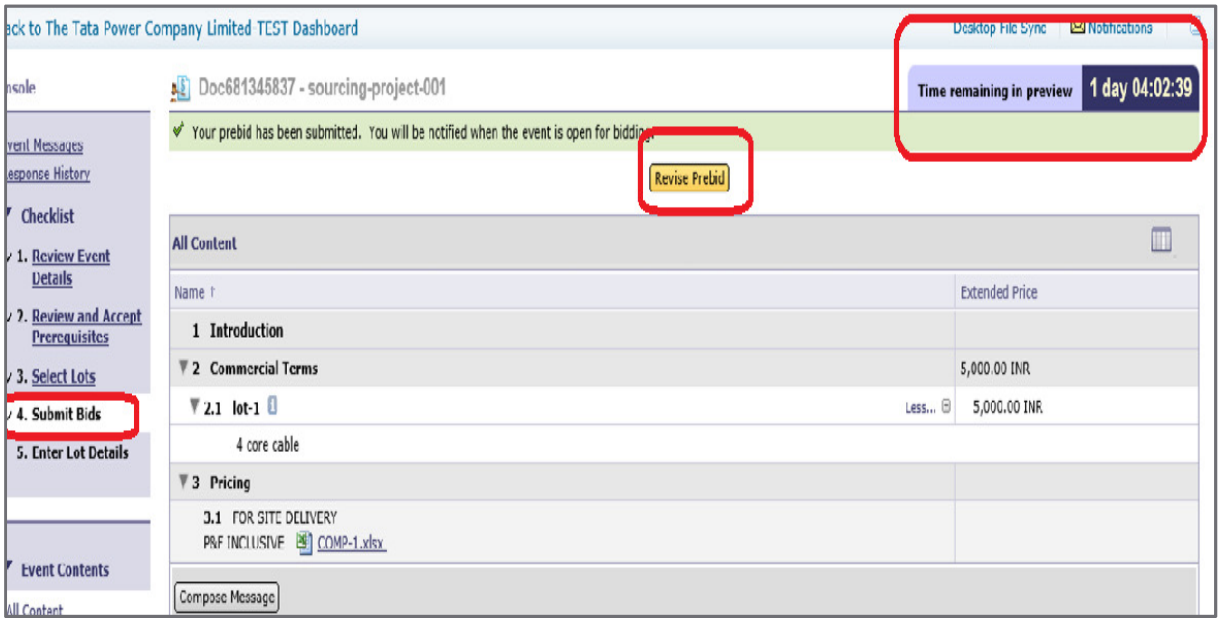
Step 1: Populate Your Answers.

Step 2: Click "Submit Entire Response".



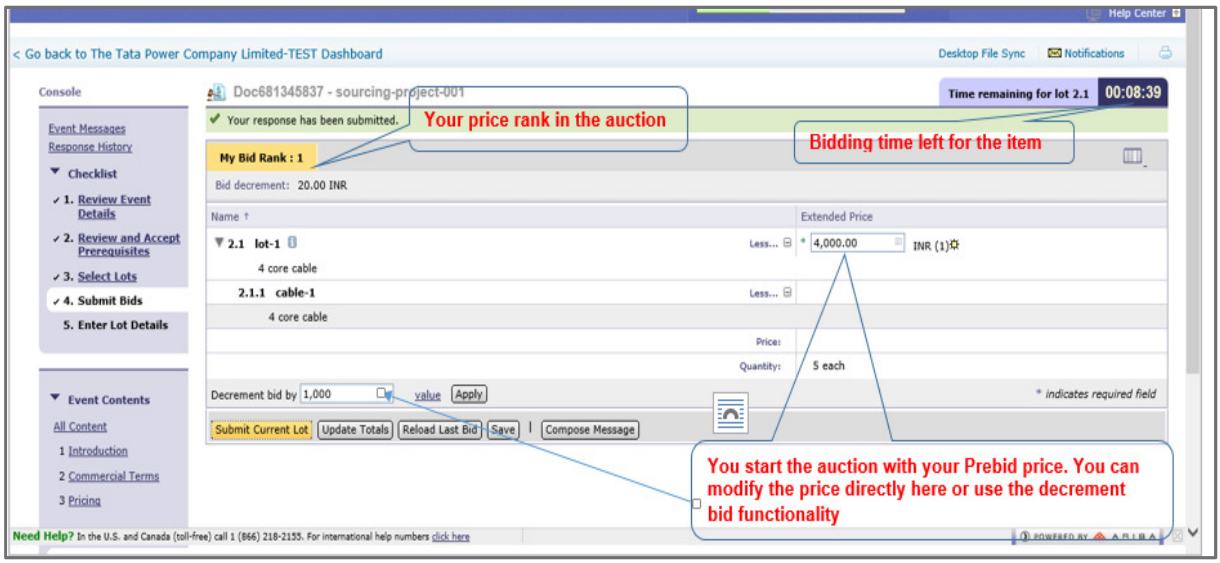
When the Prebid time is still open you can still modify your Prebid:

Click on "revise Prebid" and repeat in step 1 and step 2.



3.1.5 Participate to the e-auction

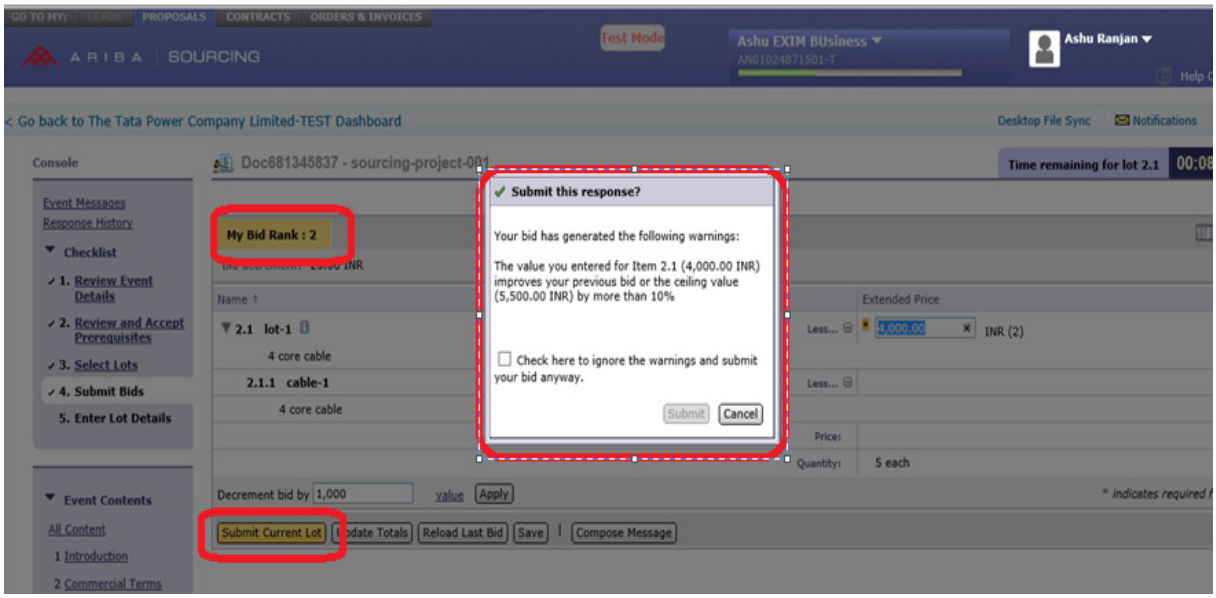
If you have placed a bid in the Prebid time you will be able to participate to the e-action. E-auctions are rather sort in time (usually less than 20 min per item). Once the time is closed you won't be able to bid anymore.



When you want to submit your price presses "submit current lot"

In case the new price you submit is lower by 10% of the starting price (Prebid Price) the following warning Message will be displayed.

To submit the new price, check the box and press submit. If you made a mistake press cancel so that you Mistake would not be submitted.



3.1.5.2 What to do if you have a problem during the e-auction?

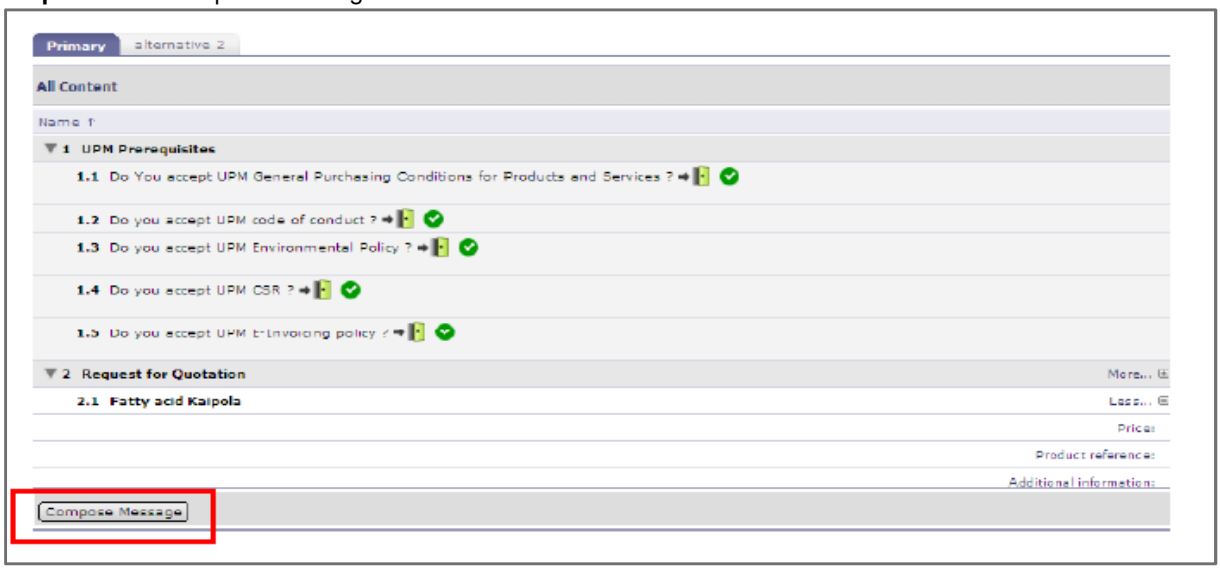
If you have any problem related the system: - **Call first Tata Power e- Bidding / Auction Cell**

- **e- Bidding /Auction Cell details:-**

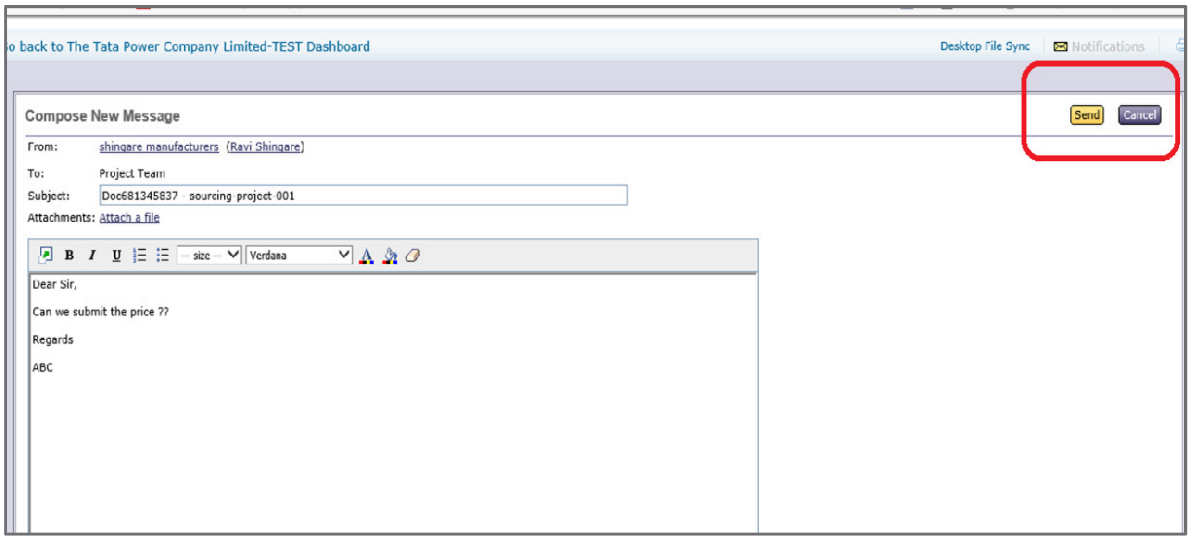
Core team		
Contact Person	**E-Mail Id**	**Contact Details**
Ravi Shingare	ravi.shingare@tatapower.com	9029004168
Himanshu Ranjan	himanshur@tatapower.com	9820339961
Escalation Matrix		
Paresh Bhatt	pareshbhatt@tatapower.com	
C T Prakash	ctprakash@tatapower.com	9223545185

4 Communicating with Tata Power Buyer & Auction team during auction / e- bidding

Step 1: Click "Compose Message".



Step 2: Compose Your Message and click "Send".



SUPPLIER-FREQUENTLY ASKED QUESTIONS

- **If I registered on my buyer's Ariba Sourcing site in the past, do I need to register again?**

Answer- Yes. Although you have registered on your buyer's Ariba Sourcing site in the past, registering on the Ariba Commerce Cloud is required. The registration process only takes a few moments, with a simple one-page registration. Registering on the Ariba Commerce Cloud gives you access to all your buyer relationships with one username and password.

- **What is the Ariba Commerce Cloud?**

Answer: - The Ariba Commerce Cloud is your entry point to all of your seller solutions.
Rather than managing log in information for multiple buyers' sites, you will have one log in and one account. This means fewer passwords to remember, easier user maintenance for your company, and a unified profile for your organization.

- **Do I need to add Product and Service Categories during registration?**

Answer:-Yes; this is a required field. Product and Service Categories classify what your company sells, and the system uses this information to match potential business opportunities with your products and services.

Click **Add Product and Service Categories** to select one or more categories from the list of options. During registration, you only need to choose one category, preferably related to the event you are joining. You can add, refine, or remove categories any time after the registration process.

- **Do I need to add ship-to or service locations during registration?**

Answer: - Yes; this is a required field. Ship-to or Service locations inform buyers where your company sells its products or provides its services, and the system uses this information to match potential business opportunities with your products and services.

Click **Add Ship-to or Service Locations** to select one or more sales territories from a list. You can add, refine, or remove ship-to or service locations any time after the registration process.

- **Do I need to enter a D-U-N-S number when I register?**

Answer: - No; this is an optional field. You are only required to complete the fields marked with an asterisk (*). If you enter a D-U-N-S number, and you get a message that the value is already in use, leave the field blank, as D-U-N-S numbers must be unique within the Ariba Commerce Cloud. Your company can have multiple Ariba accounts, but only one account can use the D-U-N-S number.

Additional Information: - D-U-N-S is a registered trademark of Dun & Bradstreet or its subsidiaries in the United States and other countries.

- **Do I need to enter a Tax ID when I register?**

Answer: - No, the Tax ID is an optional field. You are only required to fill in the fields marked with an asterisk (*).

- **What is the difference between the Email and Username fields in my profile?**

Answer: - The Email field represents the email address where you wish to receive email notifications. The Username field is the identifier that you use to access your account. The Username field must be in email format, but you do not have to use a valid email address.

Note: Leave the **This is my username** box checked if you want your email address to be the same as your username.

- **How do I participate in my buyer's event using an email invitation?**

Answer: - Use the **Click here** link in the email notification to access the sourcing event.

While buyers might customize the email content you receive, all email invitations contain a link to access the event.

Depending on your previous experience with Ariba solutions, do one of the following to access the event after you click the link:

- If you are new user, click **Continue** on the welcome page. You continue to register an Ariba account to link with your buyer and participate in the event.
- If you have used Ariba before and have already accessed an event for the buyer-specific account with your current log in ID, click the **Login** button to continue. Log in with your Ariba username and password in order to participate in the event.
- If you already have an existing Ariba Network, Ariba Discovery, or Ariba Sourcing supplier account, but you have not accessed any events for the inviting buyer's site, use the **Click here if you already have an Ariba Commerce Cloud, Ariba Discovery or Ariba Network account** link. After clicking the link, log in with your existing account to move your information to your buyer's site.

Additional Information :- Registering an Ariba account provides you with a consolidated view of all your customer relationships. With this one profile, you can view business opportunities, participate in sourcing events, participate in contract negotiations, and manage orders, catalogs, and invoices.

- **Why doesn't the link in the email invitation to participate in a sourcing event work?**

Answer:-If you cannot click the link, or the link does not open the log in page, highlight and copy the Uniform Resource Locator (URL), and then paste the URL into your web browser.

- **Can my company have multiple accounts?**

Answer:-Your Company can have multiple Ariba accounts, depending on your business needs. For example, if your company has several locations around the world, you might want a separate account for each region.

Most companies choose to have one account with multiple customer relationships, which provides a centralized location to maintain their company profile information and all of their customer relationships.

Additional Information

Consider the following items when deciding whether to have more than one account:

- **Administrators**: For each account, you can have only one account administrator, but the account administrator can provide access to multiple users. All users from your company have their own **Username** and **Password** to access the account.
- **DUNS** (data universal numbering system) **numbers**: You can add your company's DUNS number to only one account. If you plan to have multiple accounts, leave the DUNS number blank during registration.

- **How do I complete registration if my username already exists?**

Answer: - This message means that you already have an Ariba Network, Ariba Discovery, or Ariba Sourcing supplier account registered under username you entered. You can either register ua new account by creating a new username, or access one of the following sites to request a password reset for the registered username:

- Ariba Network (This login page is used for all Ariba Network, Ariba Sourcing, or Ariba Contracts suppliers).
- Ariba Discovery login page

To reset your password, click the **Having trouble logging in?** Link on the Login page.

- **Nothing happens when I click Forgot Username and enter my email address**

Issue: - Nothing happens when I click the **Forgot Username** link and enter my email address.

Cause: - After you submit your request to retrieve your username, the Ariba Network sends an email notification with usernames that match the email address you submitted.

Some possible reasons why you may not receive this username retrieval email notification:

- The email address on your account does not match the email address you entered when submitting the request.
- Your buyer-specific account was deactivated before you could move it to the Ariba Commerce Cloud. Generally, that means you probably have not participated in an event with that buyer for a while.

Solution: -

- To ensure you receive this email notification:
- Make sure you type the email address configured within your account.

If your buyer-specific account has been deactivated, contact your buyer to determine how to proceed.

- **Where is my password reset email?**

Answer: - After you submit your request for a password reset, Ariba sends instructions to the email address associated with your account. If you didn't receive a password reset email, check the following scenarios to troubleshoot.

The username you entered is in the wrong format, or it isn't associated with the email address you are checking.

- Keep in mind, your username is in the format of a full email address, but it can be associated with any email address you entered previously.
- Your username is also case-sensitive.
- To confirm that you are using the correct username and format, return to the Ariba login page, and click the **Having trouble logging in?** link (**Forgot Username** if you're working in Ariba Discovery).
    - Choose **I forgot my username**, and click **Continue**.
    - Enter the email address associated with your account, and click **Submit**.
    - You will receive an email that lists the exact format of the username associated with the email you entered.

You entered the correct username, but you still didn't receive the password reset email notification.

- This can occur if the configured email address is different from the account you are checking.
- You might have multiple accounts for your company, so make sure you are attempting to access the correct account.

Your email configuration or company's security settings might also prevent you from receiving the password reset email. To find out, check your junk mail folder or email filter settings to verify that automated emails from Ariba are not blocked from your email account.

- **Why do I get this message on the SAP Ariba Login page: "The username and password pair you entered was not found"?**

Answer: - You entered an incorrect **Username** or **Password**. You might receive this message if you entered a previous **Username** or **Password**. Remember that your **Username** has the format of an email address, and both the **Username** and **Password** are case sensitive.

Click the **Having trouble logging in?** Link on the Login page if you don't remember your log in information.

-: Steps for tender submission:-

Step 1: Vendor will get an **invitation email** from Ariba System. Keep this email, it contains your login Information and a direct link to Ariba.

URL for Supplier Users: http://tatapower.supplier.ariba.com

Step 2: Click **"Click Here" to access this event.**

Step 3: If you are first time vendor you will get the **"Sign UP" window**. Click on the same. If this screen is not appearing then close the window and follow the steps.

If the vendor has already created User id and password then after step 2 he will directly get the login screen. After credentials → click on ARIBA APPS and click on Proposals.

Step 4: After Continue simple one-page registration screen will open. Define your password and secret question. Click "OK"

Step 5: You will be able to see the RFQ

Step 6: After review and downloading of all documents click on **"Review Prerequisites"**

Step 7: Review and accept **"Bidder Agreement".**

Step 8: Select Items or Lots → **Click "Submit Select Lots"**

Step 9: Vendor has to submit their **techno commercial offer in 2.1." Pls Attach Techno commercial Bid "**In this field Do No attach any price content.

For Price Bid put all the unit price and taxes and duties in provided field. Put "0" (ZERO) in not applicable field.

Step 10: After successfully putting Techno commercial offer and price part then click on **"Submit Entire Response"**