ODISHA POWER TRANSMISSION CORPORATION LIMITED
OFFICE OF THE CHIEF GENERAL MANAGER
CENTRAL PROCUREMENT CELL
JANAPATH, BHUBANESWAR-751022

TEL NO: 0674-2541801 FAX NO- 0674-2542964

TENDER SPECIFICATION NO

SR.G.M-CPC-e TENDER-ENERGY METERS & METERING PANELS-18/2021-22

FOR

SUPPLY, ERECTION, TESTING, COMMISSIONING, COMPREHENSIVE AMC (FOR 07 YEARS) OF 0.2s ACCURACY CLASS A.C STATIC ABT (DLMS) COMPLIANT (CATEGORY-B) TRIVECTOR ENERGY METER SUITABLE FOR ENERGY ACCOUNTING/AUDITING & ALSO INTERFACE METERS ALONG WITH SUPPLY OF METERING PANELS FOR ACCOMODATING 08 NOS OF ENERGY METERS IN EACH PANELS FOR OPTCL SYSTEM

PART-I TECHNO-COMMERCIAL BID

SECTION-I- INSTRUCTION TO BIDDERS (COMMERCIAL)
SECTION-II- GENERAL CONDITIONS OF CONTRACT (COMMERCIAL)
SECTION-III- LIST OF ANNEXURES (COMMERCIAL)
SECTION-IV- TECHNICAL SPECIFICATION
SECTION-V COMPREHENSIVE AMC

PART-II PRICEBID

Request for online tender documents –	From dt.	15.07.2021	(11.00 Hrs)
	to dt. .	10.08.2021	(13.00 Hrs)
Tender closing date & time –	dt.	10.08.2021	(15.00 Hrs)
Techno Commercial open date & time-	dt.	11.08.2021	(11.00 Hrs)

ODISHA POWER TRANSMISSION CORPORATION LTD.
REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,
ODISHA

e-TENDER NOTICE NO-NIT-CPC- 18/2021-22

For and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD, C.G.M. [C.P.C.] invites Tenders from reputed manufacturers in two part bidding system for Supply, Erection, Testing, Commissioning & Comprehensive AMC (for 07 years) of 157nos of 0.2s accuracy class A.C static ABT (DLMS) compliant (Category-B) Trivector energy meter suitable for energy accounting/auditing & also interface meters along with supply of 60nos of metering panels suitable for accommodating 08nos of such energy meters in each panel for OPTCL System. The interested bidders would be required to enroll themselves on the tender portal **www.tenderwizard.com/OPTCL**. Complete set of bidding documents are available at ***www.tenderwizard.com/OPTCL*** **from dt. 15-07-2021 (11.00 Hrs) to dt. 10-08-2021 (13.00) hrs.** Interested manufacturers may visit OPTCL's official web site **http://www.optcl.co.in** and **www.tenderwizard.com/OPTCL** for detail specification.

N.B:- All subsequent addendums/corrigendum to the tender shall be hosted in the OPTCL's official web site **http://www.optcl.co.in** and **www.tenderwizard.com/OPTCL only.**

CHIEF GENERAL MANAGER [C.P.C.]
CENTRAL PROCUREMENT CELL

NOTICE INVITING TENDER
ODISHA POWER TRANSMISSION CORPORATION LTD.,
REGD. OFFICE: JANPATH, BHUBANESWAR – 751 022,
ODISHA, INDIA.
e-TENDER NOTICE NO- CPC- 18/2021-22

For and on behalf of the ODISHA POWER TRANSMISSION CORPORATION LTD., the undersigned invites bids under two-part bidding system in e- tendering mode only as per the following details.

Sl. No	Tender Specification Nos	Description of materials.	Qty in Nos	INDIAN RUPEES			Last date of submission & Date of opening of Tender
				Earnest Money Deposit	Cost of Tender Spec. Document	Tender Processing Fee	
1.	Sr.G.M.-CPC –e TENDER - ENERGY METERS & METERING PANELS-18/2021-22	Supply, Erection, Testing, Commissioning & Comprehensive AMC (for 07 years) of 0.2s accuracy class, A.C static ABT (DLMS) compliant (Category-B) Trivector energy meter suitable for energy accounting/auditing & also interface meters for OPTCL metering System	157	**NIL (Bid Security Declaration to be furnished in lieu of EMD)**	Rs. 14,160/- (Including GST @18%)	Rs.5900/-	**Up to 10.08.2021 (15.00 Hrs.) & on 11.08.2021 at 11.00 Hrs.**
2		Supply of metering panels suitable for accommodating 08nos of energy meters in each panels for OPTCL System.	60				

N: B- No part bidding is allowed.

The bidders can view the tender documents from website free of cost.

TENDER COST:

The bidders who want to submit bid shall have to pay Rs. 14,160/- (Rupees Fourteen thousand one hundred sixty) only nonrefundable including GST @ 18%) towards the tender cost, online through e-payment gateway link provided in e-tender portal (by using Net Banking, Debit Card or Credit Card). The online payment can be made prior to last date & time of submission of online tender. They have to also submit notarized hard copy of GST registration certificate on or before the scheduled date & time of opening of techno-commercial bid.

TENDER PROCESSING FEE:

The bidders shall have to pay nonrefundable amount of Rs. 5,900/- (Rupees five thousand nine hundred only) towards the tender processing fee to K.S.E.D.C. Ltd, in e-payment mode. The e-payment of above amount is to be made to enable the bidder to download the bid proposal sheets and bid document in electronic mode.

SUBMISSION OF TENDER COST & TENDER PROCESSING FEE :

The bidders shall submit notarised hard copy of valid registration as **Local (In the state of Odisha) MSE** (if any) and **upload the same in the prescribed form in .gif or .jpg format** in addition to **sending the original as stated above with in the scheduled date & time for opening of bid**.

The prospective bidders are advised to register their user ID, Password, company ID from website **www.tenderwizard.com/OPTCL** by clicking on hyper link "Register Me".

Any clarifications regarding the scope of work and technical features of the project can be had from the undersigned during office hours.

Minimum qualification criteria of bidders: AS STIPULATED IN SECTION-II, PART-I (G.T.C.C) OF THE TENDER SPECIFICATION.

CHIEF GENERAL MANAGER
CENTRAL PROCUREMENT CELL

FAX NO.: 0674 – 2542964
TELEPHONE NO: 0674 – 2541801

ODISHA POWER TRANSMISSION CORPORATION LTD.
CENTRAL PROCUREMENT CELL
JANAPATH, BHUBANESWAR – 751022

TENDER SPECIFICATION NO- SR.G.M-CPC-e TENDER- ENERGY METERS & METERING PANELS-18/2021-22

CONTAINING

PART – I

SECTION – I : INSTRUCTION TO BIDDERS

SECTION – II : GENERAL TERMS AND CONDITIONS OF CONTRACT (G T C C)

SECTION – III : LIST OF ANNEXURES

SECTION – IV : TECHNICAL SPECIFICATION

SECTION – V : COMPREHENSIVE AMC FOR 07 YRS FOR OPTCL SYSTEM

PART – II PRICE BID.

TABLE OF CONTENTS

PART – I

SECTION – I INSTRUCTIONS TO BIDDERS

COMMERCIAL SPECIFICATION
PART-I
SECTION-I
INSTRUCTIONS TO BIDDERS

1. <u>Submission of Bids: -</u>

The bidder shall submit the bid in Electronic Mode only i.e. **www.tenderwizard.com/OPTCL**. The bidder must ensure that the bids are received in the specified website of the OPTCL by the date and time indicated in the Tender notice. Bids submitted by telex/telegram will not be accepted. No request from any bidder to the OPTCL to collect the Bids in physical form will be entertained by the OPTCL.

The OPTCL reserves the right to reject any bid, which is not deposited according to the instruction, stipulated above. The participants to the tender should be registered under GST Laws.

1. For all the users it is mandatory to procure the Digital Signatures.
2. Contractors / Vendors / Bidders / Suppliers are requested to follow the below steps for Registration:
   a. Click "Register", fill the online registration form.
   b. Pay the amount of Rs. 2360/- through e-payment mode only in Favour of KSEDCL Payable at Bangalore.
   c. Send the acknowledgment copy for verification.
   d. As soon as the verification is being done the e-tender user id will be enabled.
3. After viewing Tender Notification, if bidder intends to participate in tender, he has to use his e-tendering User Id and Password which has been received after registration and acquisition of DSCs.
4. If any Bidder wants to participate in the tender he will have to follow the instructions given below:
   a. Insert the PKI (which consist of your Digital Signature Certificate) in your System. (Note: Make sure that necessary software of PKI be installed in your system).
   b. Click / Double Click to open the Microsoft Internet Explorer (This icon will be located on the Desktop of the computer).
   c. Go to Start > Programs > Internet Explorer.
   d. Type **www.tenderwizard.com/OPTCL** in the address bar, to access the Login Screen.
   e. Enter e-tender User Id and Password, click on "Go".
   f. Click on "Click here to login" for selecting the Digital Signature Certificate.
   g. Select the Certificate and enter DSC Password.
   h. Re-enter the e-Procurement User Id Password
5. To make a request for Tender Document Bidders will have to follow below mentioned steps.
   - Click "Un Applied" to view / apply for new tenders.
   - Click on Request icon for online request.
6. After making the request Bidders will receive the Tender Documents which can be checked and downloaded by following the below steps:
   - Click to view the tender documents which are received by the user.
   - Tender document screen appears.
   - Click "Click here to download" to download the documents.
   -
7. After completing all the formalities Bidders will have to submit the tender and they must take care of following instructions.

- Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.
- Note down / take a print of bid control number once it displayed on the screen

8. Tender **Opening event** can be viewed online.
9. Competitors bid sheets are available in the website for all.

For any e-tendering assistant contact help desk number mentioned below.

- Bangalore – 080- 40482000.

The participants to the tender should be registered under ODISHA Sales Tax, Act, VAT Act/Central sales Tax Act/ GST Laws.

2. Division of Specification.

The specification is mainly divided into two parts viz. Part-I & Part-II.

Part-I Consists of

[i] Section-I	Instruction to Bidders.
[ii] Section-II	General Terms & conditions of contract.
[iii] Section-III	Schedules and forms etc.
[iv] Section-IV	Technical Specification.
[v] Section-V	Comprehensive AMC for 7 years

Part-II Consists of

[i] Abstract of price components as per Annexure-IV

[ii] Schedule of prices as per Annexure-V & V(a)

3. Tenders shall be in Two Parts.

The Bidders are required to submit the tenders in two parts viz. Part-I (Techno commercial) & Part-II (Price bid).

4. Opening of Bids.

[a] The part-I shall be opened on the date and time fixed by the OPTCL for opening of bids in Electronic mode in presence of such of the Bidders or their authorized representatives [limited to one person only] on the due date of opening of tender who opt to remain present. After scrutiny of the technical particulars and other commercial terms, clarifications, if required, shall be sought for from the bidders. The Bidders shall be allowed 15 days' time for such activity.

[b] On receipt of technical clarification, the bids shall be reviewed, evaluated and those not in conformity with the technical Specification / qualifying experience, shall be rejected. If any of the technical proposal require for modification to make them comparable, discussion will be held with the participating bidders.

All the responsive bidders shall be given opportunity to submit the revised technical and revised price proposals as a follow up to the clarification (modification if any) on the technical proposals. The qualified bidders shall be given opportunity to submit revised price proposals within 15 days from the date of such discussion or within time frame mutually agreed, whichever is earlier.

[c] When the revised price proposals are received, the original price proposals will be returned to the bidders unopened along with their original technical proposals. Only the revised technical and price proposals will be considered for bid evaluation. The price bids [Part-II] of such of the Bidders, whose tenders have been found to be technically and commercially acceptable, including those supplementary revised price bids, submitted

subsequently, shall be opened in the presence of the bidder's representative on a date and time which will be intimated to all technically and commercially acceptable Bidders.

[d] The bidders are required to furnish sufficient information to the Purchaser to establish their qualification, capacity to manufacture and/or supply the materials/perform the work. Such information shall include details of bidder's experience, its financial, managerial and technical capabilities.

[e] The bidders are also required to furnish details of availability of appropriate technical staff and capability to perform after sales services. The above information shall be considered during scrutiny and evaluation of bids and any bid which does not satisfactorily meet these requirements, shall not be considered for price bid evaluation.

[f] The price bids of the technically and otherwise acceptable bids shall only be evaluated as per the norms applicable in terms of this Specification.

5. Purchaser's Right Regarding Alteration of Quantities Tendered.

The Purchaser may alter the quantities of materials/equipment at the time of placing orders. Initially the purchaser may place orders for lesser quantity with full freedom to place extension orders for further quantity under similar terms and conditions of the original orders. Orders may also be split among more than one tenderer for any particular item, if considered necessary in the interest of the Purchaser to get the goods/equipment earlier.

6. Procedure and opening time of tenders.

Tenders will be opened in the office of the Senior General Manager [C.P.C.] on the specified date and time in presence of the Bidders or their authorized representatives [limited to one person only in case of each bidder who may desire to be present, at the time of opening the bids.

7. Bidder's Liberty to deviate from Specification.

The Tenderer may deviate from the specification while quoting, if in his opinion, such deviation is in line with the manufacturer's standard practice and conducive to a better and more economical offer. All such deviations should however be clearly indicated giving full justifications for such deviation. [Read with Clause-9, Section-II of the Specification].

8. Eligibility for submission of bids.

Only those manufacturers who have deposited the cost of tender specification are eligible to participate in the tender. They should submit the money receipt as a proof of such payment. The **Local (In the state of ODISHA) Micro and small Enterprises** (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC **(Registered in Odisha)** can participate without payment of the cost of tender specification

9. Purchaser's right to accept/reject bids:

The purchaser reserves the right to reject any or all the tenders without assigning any reasons what so ever if it is in the interest of OPTCL, under the existing circumstances. [Read with clause-10, Section-II of the specification].

10. Mode of submission of Tenders.

[A] Tenders shall be submitted in electronic mode only. (www.tenderwizard.com/OPTCL)

[B] **Telegraphic or FAX tenders** shall not be accepted under any circumstances.

11. Earnest money deposit (Not applicable for this tender)

The tender shall be accompanied by Earnest Money deposit of value specified in the notice inviting tenders against each lot / bid. Tenders without the required EMD as indicated at **Annexure-VIII** will be rejected out rightly.

The **Local (In the state of ODISHA) Micro and small Enterprises** (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC **(Registered in Odisha)** can participate by submitting Earnest Money Deposit @ 50 (fifty) percent of the amount indicated in the Notice Inviting Tender.

The earnest money deposit shall be furnished in one of the following forms subject to the conditions mentioned below:

(a) **Cash:-**Payable to Drawing & Disbursing Officer, OPTCL (Head Qrs. Office) Bhubaneswar -22

(b) **Bank Draft**: -To be drawn in favour of Drawing & Disbursing Officer, OPTCL [Head Qrs. Office], Bhubaneswar-751022.

(c) Bank Guarantee from any Nationalized/Scheduled Bank strictly as per enclosed proforma vide **Annexure-VI** to be executed on non-judicial stamp paper worth Rs. 29.00 or as applicable, as per prevailing laws in force and also to be accompanied by the confirmation letter of the issuing Bank Branch.

(d) National saving certificate duly pledged in favour of Senior General Manager [Central Procurement Cell] OPTCL {Head Qrs. Office] Bhubaneswar-751022.

NOTE:

(i). The validity of the EMD in the form of Bank Guarantee shall be at least for 240 days from the date of opening of tender failing which the tender will be liable for rejection.

(ii) No interest shall be paid on the Earnest Money Deposit.

(iii) E.M.D. in shape of cash may be submitted up to Rs. 25,000/- (Rupees Twenty-five) Thousand) only. Above Rs. 25,000/- (Rupees Twenty-five thousand) the Earnest Money Deposit shall be furnished in any one of the forms indicated above (i.e. Through Bank Draft, Bank Guarantee/ National Savings Certificate).

(iv) No adjustment towards EMD shall be permitted against any outstanding amount with the **ODISHA POWER TRANSMISSION CORPORATION LTD**.

(v) The chart showing particulars of EMD to be furnished by Bidders of different categories is placed at **Annexure-VIII.**

(vi) In the case of un- successful tenderer, the EMD will be refunded after the tender is decided. In the case of successful Tenderer, this will be refunded only after furnishing of security money referred to the clause-19 of Section-II.

(vii) Suits, if any, arising out of this clause shall be filed in a Court of law to which the jurisdiction of High Court of ODISHA extends.

(vii) EMD will be forfeited if the tenderer fails to accept the letter of intent and/or purchase order issued in his favour or to execute the order, placed on them.

(viii) Tenders not accompanied by Earnest Money shall be disqualified.

12. Validity of the Bids: -

The tenders should be kept valid for a period of **180** days from the date of opening of the tender, failing which the tenders will be rejected.

13. PRICE: -

Bidders are requested to quote-'FIRM' Price. No deviation from **FIRM PRICE** will be entertained irrespective of deviation clause No.7 of this part of the specification.

14. **Revision of tender price by Bidders**: -

[a] After opening of tenders and within the validity of period, no reduction or enhancement in price will be entertained. If there is any change in price, the tender shall stand rejected and the bidder shall be debarred from participating in OPTCL tenders for a period of three years as per Bid Security Declaration .

[b] After opening of price bid if the validity period is not sufficient to place purchase order, the tenderer may be asked by the purchaser to extend the validity period of the bid under the same terms and condition as per the original tender.

However, the tender are free to change any or all conditions including price except delivery period of their bids at their own risk, if they are asked by the purchaser to extend the validity period of the bid prior to opening of price bid.

15. Bidders to be fully conversant with the clauses of the Specification: -

Bidders are expected to be fully conversant with the meaning of all the clauses of the specification before submitting their tenders. In case of doubt regarding the meaning of any clause, the tenderer may seek clarification in writing from the Senior General Manager (Central Procurement Cell) OPTCL. This, however, does not entitle the Tenderer to ask for time beyond due date, fixed for receipt of tender.

16. Documents to Accompany Bids.

Bidders are required to upload the Scanned/.pdf copy of the following document as vender generic document and also upload the .xls bid documents as mentioned below:-

Part-I of the Tender shall contain the following documents.

Sl no	Document Details	File Name
1	Declaration Form duly filled in and signed. (As per Annexure –I)	Attachment1.pdf
2	**(a) Tender cost (c)Tender Processing fee.**	Attachment2.pdf
3	Technical specification and Guaranteed Technical Particulars conforming to the Purchaser's Specification along with drawings, literatures and all other required Annexures, duly filled in.	Attachment3.pdf
4	Photostat copies of latest type test certificate of materials/equipment offered. (Type tests should have been conducted within 5 years prior to the dated tender opening and not earlier).	Attachment4.pdf
5	Abstract of Terms & conditions in prescribed proforma as per **Annexure-II**	Attachment5.pdf
6	General Terms & Conditions of supply offer as per Section-II of the Specification.	Attachment6.pdf
7	List of orders executed for similar materials/equipments during preceding 2 (two) years indicating the customer's name, Purchase Order No. & Date, date of supply and date of commissioning etc.	Attachment7.pdf
8	Data on past experience **as per Clause-7 of Section-II** of the Specification	Attachment8.pdf
9	GST compliance rating. The GST identification Number (GSTIN) under GST laws and permanent account number [PAN] of the firm is required under Income tax Act.	Attachment9.pdf
10	Audited Balance sheet & profit loss accounts of the bidder for past three years.	Attachment10.pdf
11	Schedule of quantity and delivery in the prescribed Proforma as attached	Attachment11.pdf
12	List of Orders in hand to be executed	Attachment12.pdf
13	Deviation schedule.	Attachment13.pdf
14	Notarized hard copy and soft copy of valid registration as local (**In the state of Odisha)** MSE (if any).	Attachment14.pdf

Part-I (Techno-commercial Bid Sheet).

1	All the.xls sheets are to be down loaded and filled in completely and uploaded without any modification to the file name.	.xls sheet name /file name is not to be modified

17. **Price Bid.**

(a) Part – II of the tender shall consist of the following

(i) Abstract of Price Component, as per Annexure-IV

(ii) The bidder has to fill up the schedule of prices in the prescribed proforma on line.

18. **Conditional Offer:**

Conditional offer shall not be accepted.

19. **General: -**

(i) In the event of discrepancy or arithmetical error in the schedule of price, the decision of the purchaser shall be final and binding on the Tenderer.

(ii) For evaluation, the price mentioned in words shall be taken if there is any difference in figures and words in the price bid.

(iii) Notice inviting tender shall form part of this specification.

(iv) The price bids of the technically and otherwise acceptable bids shall only be evaluated.

(v) Tenderer can offer any lot or all the lots of the tender, if there is more than one lot. But the tender (bid) must be furnished separately for each lot. For each lot, the tenderer has to submit PART-I & PART-II of the bids separately.

(vi) It should be distinctly understood that the part-II of the bid shall contain only details/documents relating to price, as outlined in clause-17 mentioned herein above. Inclusion of any of the documents/information etc. shall render the bid liable for rejection.

20. PRE-BID Discussion: A pre-bid discussion shall be held prior to opening of the techno-commercial bid, if necessary. (First Part).

21. Expenses in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site.

The testing and inspection of the equipment/ materials at manufacturer works are in the scope of work of the Contractor/Supplier.

OPTCL inspecting officer, on receipt of offer for inspection from the contractor/supplier, proceeds to the manufacturer works to witness the Type/Acceptance/Routine test.

Important:

It is hereby informed to all the bidders that the relevant clauses of the contract specification, pertaining to inspection and testing of equipment/materials, are hereby supplemented with following additional terms and conditions.

The expenses under the following heads, in respect of OPTCL's representative for witnessing the inspection & testing of the offered equipment/materials at the inspection and testing site, shall be borne by the contractor / supplier.

a) Hotel Accommodation:

I. Single room accommodation in 4 star hotels for the OPTCL inspecting officer of the rank of Assistant General Manager (Grade E-6) and above.

II. Single room accommodation in 3 star hotels for the OPTCL inspecting officer of the rank below Assistant General Manager (Grade E-6).

N.B.: It is the responsibility of the contractor to arrange the hotel accommodation matching with their inspection and testing schedule, so that the inspecting officer can check-in the hotel one day prior to the date of inspection and check out after the completion of the inspection, subject to availability of the return travel ticket. In case of extended duration of inspection or non-availability of the return travel ticket, Contractor/supplier/manufacturer shall arrange for the extended stay of the inspecting officer in the Hotel accordingly. In case there is no hotel with prescribed standard in and around the place of inspection, the

contractor/supplier/manufacturer shall suggest alternative suitable arrangement at the time of offer for inspection, which is subjected to acceptability of OPTCL inspecting officer.

b) Journey of the inspecting officer:

(i) To and fro travel expenditure from the Head Quarters of the inspecting officer to the place of inspection/testing shall be borne by the contractor/supplier/manufacturer. Journey from the Head Quarters of the inspecting officer to the nearest Air Port by train (Ist/IInd A.C) & A/C Taxi then by Air to the place of inspection/testing or to the nearest place of inspection/testing and then by train (Ist/IInd A.C) & A/C taxi to the place of inspection/testing shall be arranged by the contractor/supplier/manufacturer.

(ii) For train journey, inspecting officer of the rank Assistant General Manager and above shall be provided with 1st class AC ticket and inspecting officer below the rank of Assistant General Manager shall be provided with 2nd class AC ticket.

(iii) The Air-ticket / train-ticket booking/cancellation is the responsibility of the contractor / supplier.

(iv)Moreover, if during the journey there is an unavoidable necessity for intermediate travel by road/ waterway/sea-route, the contractor/supplier shall provide suitable conveyance to the inspecting officer for travel this stretch of journey or bear the cost towards this. Any such possibilities shall be duly intimated to OPTCL at the time of their offer for inspection.

c) Local Conveyance:

At the place of the inspection/testing, for local journey of the inspecting officer between Hotel and inspection/testing site and or any other places, Air-conditioned four wheeler vehicle in good condition shall be provided by the contractor/supplier/manufacturer.

d) Following points are also to be considered:

(i) All the above expenses shall be deemed to be included in the bidder's quoted price for that supply item. Bidder shall not be eligible to raise any extra claim in this regard.

(ii) Contractor/supplier/manufacturer may assume that only in 40% of the inspection and testing offer cases, OPTCL inspecting officer, not below the rank of Assistant General Manager will witness the inspection and testing.

(iii) In case of inspection and testing of some critical equipment/materials like Power Transformers, OPTCL may depute more than one inspecting officer.

(iv) Contractor/supplier/manufacturer shall judiciously plan the inspection/testing schedule and place of inspection/testing, so that optimum number of inspection/testing and minimum time shall be required to cover all the equipment/materials of the relevant contract package.

(v) It shall be the responsibility of the Contractor/Supplier to organize the above tour related matters of OPTCL inspecting officer including the matters related to overseas inspection/testing, if any.

21. Litigation/Arbitration

(i)- Bidder has to furnish detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of litigation by or against the bidder may result in rejection of bid.

(ii) The bidder should not have any pending litigation or arbitration with OPTCL with regard to any project or related activity. The bidder should certify/declare the same in unequivocal terms by way of an affidavit duly sworn before a magistrate or notary. Bid furnished by the bidder shall not be eligible for consideration if it is not accompanied by the affidavit. Further, the bid/LOA/LOI shall liable for outright rejection/cancellation at any stage if any information contrary to the affidavit/declaration is detected.

PART-I
SECTION-II
GENERAL TERMS AND CONDITIONS OF CONTRACT
[G.T.C.C.]

PART-I
SECTION-II
GENERAL TERMS AND CONDITIONS OF CONTRACT [G TCC]

1. **Scope of the contract:**

The scope of the contract shall be to design, manufacture, supply of equipments/materials as per the specification at the consignee's site, and rendering services in accordance with the enclosed technical specification and bill of quantity.

2.0 Definition of terms:

For the purpose of this specification and General Terms and Conditions of contract [GTCC], the following words shall have the meanings hereby indicated, except where otherwise described or defined.

2.1 "The Purchaser" shall mean the Senior General Manager [Central Procurement Cell] for and on behalf of ODISHA POWER TRANSMISSION CORPORATION LTD., Bhubaneswar.

2.2 "The Engineer" shall mean the Engineer appointed by the Purchaser for the purpose of this contract.

2.3 "Purchaser's Representative" shall mean any person or persons or consulting firm appointed and remunerated by the Purchaser to supervise, inspect, test and examine workmanship and materials of the equipment to be supplied.

2.4 "The supplier" shall mean the Bidder whose bid has been accepted by the purchaser and shall include the Bidder's executives, administrators, successors and permitted assignees.

2.5 "Equipment" shall mean and include all machinery, apparatus, materials, and articles to be provided under the contract by the suppliers.

2.6 "Contract Price" shall mean the sum named in or calculated the bid.

2.7 "General Condition" shall mean these General Terms and Conditions of Contract.

2.8 The Specification" shall mean both the technical as well as commercial parts of the specification annexed to or issued with GTCC and shall include the schedules and drawings, attached thereto as well as all samples and pattern, if any.

2.9 "Month" shall mean "Calendar month".

2.10 Writing" shall include any manuscript, type written, printed or other statement reproduction in any visible form and whether under seal or under hand.

2.11 "Basic Price (Taxable Value for goods) at the point of destination" shall mean the price quoted by the bidder for equipment and material at the consignee's store/site. The cost is inclusive of packing, forwarding, freight, insurance and all expenses and taxes and duties at the end of the supplier excluding Goods and Service Tax. The Goods & Service Tax shall be shown in a separate column item wise alongside the Basic Price quoted at the applicable rate in the Tax Invoice. The applicable rate of GST shall refer to the HSN code of the material supplied. The Basic Price and GST thereon shall be the "FOR Destination Price" as quoted by the bidder.

2.12 The term "Contract document" shall mean and include GTCC, specifications, schedules, drawings, form of tender, Notice Inviting Tender, covering letter, schedule of prices or the final General Conditions, any special conditions, applicable to the particular contract.

2.13 Terms and conditions not herein defined shall have the same meaning as are assigned to them in the Indian Contract Act, failing that in the Orissa General Clauses Act.

3. Manner of execution:

All equipments/materials supplied under the contract shall be manufactured in the manner, set out in the specification or where not set out, to the reasonable satisfaction of the Purchaser's representative.

4. Inspection and Testing:

[i] The purchaser's representative shall be entitled at all reasonable times during manufacture to inspect, examine and test at the supplier's premises, the materials and workmanship of all equipments/materials to be supplied under this contract and if part of the said equipment is being manufactured in other premises, the supplier shall obtain for the purchaser's representative permission to inspect, examine and test as if the equipment were being manufactured in the contractor's premises. Such inspection, examination and testing shall not release the supplier from his obligations under the contract.

[ii] The Supplier shall give to the purchaser adequate time/notice (at least clear 15 days for inside the state suppliers and 20 days for outside the state suppliers) in writing for inspection of materials indicating the place at which the equipment/material is ready for testing and inspection and shall also furnish the shop Routine Test Certificate, Calibration certificates of Testing instruments, calibrated in Govt. approved laboratory with authenticity letter of that laboratory along with the offer for inspection. A packing list along with the offer, indicating the quantity which can be delivered in full truck load/Mini truck load to facilitate issue of dispatch instruction shall also be furnished.

[iii] Where the contract provides for test at the Premises of the supplier or any of his sub-vendors, the supplier shall provide such assistance, labour, materials, electricity, fuel and instruments, as may be required or as may be reasonably demanded by the Purchaser's representative to carry out such tests efficiently. The supplier is required to produce shop routine test Certificate, calibration certificates of Testing Instruments before offering their materials/equipment for inspection & testing. The test house/laboratory where tests are to be carried out must be approved by the Govt. A letter pertaining to Govt. approved laboratory must be furnished to the purchaser along with the offer for inspection.

[iv] After completion of the tests, the Purchaser's representative shall forward the test results to the Purchaser. If the test results conform to the specific standard and specification, the Purchaser shall approve the test results and communicate the same to the supplier in writing. The supplier shall provide at least five copies of the test certificates to the Purchaser.

[v] The Purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is dispute regarding the quality of supply.

[vi] If the Firm fails to present the offered item/s for inspection/testing as per their inspection call due to any reason/s during the visit of the inspecting officer at the testing site, the Firm have to bear all expenses towards the repetition of inspection/testing of the total offered quantity or part thereof.

5. Training facilities.

The supplier shall provide all possible facilities for training of Purchaser's Technical personnel, when deputed by the Purchaser for acquiring firsthand knowledge in assembly of the equipment, its erection, commissioning and for its proper operation and maintenance in service, wherein it is thought necessary by the purchaser.

6. Rejection of Materials.

In the event any of the equipments/materials, supplied by the manufacturer is found defective due to faulty design, bad workmanship, bad materials used or otherwise not in conformity with the requirements of the Specification, the Purchaser shall either reject the equipment or ask the supplier in writing to rectify or replace the defective equipment free of cost to the purchaser. The contractor

on receipt of such notification shall either rectify or replace the defective equipment free of cost to the purchase within 15 days from the date of issue of such notification by the purchaser. If the supplier fails to do so, the Purchaser may:-

[a] At its option replace or rectify such defective equipments/materials and recover the extra costs so involved from the supplier plus fifteen percent and/or.

[b]Terminate the contract for balance work/supplies, with enforcement of penalty Clause as per contract for the undelivered goods and with forfeiture of Performance Guarantee/Composite Bank guarantee.

[c] Acquire the defective equipment/materials at reduced price, considered equitable under the circumstances.

7. Experience of Bidders:

The Bidders should furnish information regarding experience particularly on the following points:

[i] Name of the manufacturer:

[ii] Standing of the firm and experience in manufacture of equipment/material quoted:

[iii] Description of equipment/material similar to that quoted, supplied and installed during the last **five** years with the name(s) of the Organizations to whom supplies were made wherein; at least one (1) certificate shall be from a state/central P.S.U.

[iv] Details as to where installed etc.

[v] Testing facilities at manufacturer's works.

[vi] If the manufacturer is having collaboration with another firm [s], details regarding the same.

[vii] A list of purchase orders of identical material/equipments/materials offered as per technical specification executed during the last two years along with users certificate. User's certificate shall be legible and must indicate user's name, address, designation, place of use, and satisfactory performance of the equipment/materials for at least two years from the date of commissioning. Wherein at least one (1) certificate shall be from a State/Central or P.S.U. Bids will not be considered if the past manufacturing experience is found to be un-satisfactory or is of less than 5 (five) years on the date of opening of the bid and bids not accompanying user's certificate will be rejected.

[viii] The bidder shall have executed at least two Turnkey contracts of value each not less than 10 Crores in last five years involving Supply, Installation, Data Collection & Report Generation and Annual maintenance. Documentary evidence in support of the same shall be submitted with the bid.

8. **Language and measures**:

All documents pertaining to the contract including specifications, schedule, notices, correspondence, operating and maintenance instructions, drawings or any other writing shall be written in English language. The metric system of measurement shall be used exclusively in this contract.

9. **Deviation from specification**:

It is in the interest of the Bidders to study the specification, specified in the tender schedule thoroughly before tendering so that, if any deviations are made by the Bidders,(both commercial and Technical), the same are prominently brought out on a separate sheet under heading "Deviations Commercial" and " Deviations Technical".

A list of deviations shall be enclosed with the tender. Unless deviations in scope, technical and commercial stipulations are specifically mentioned in the list of deviations, it shall be presumed that the Bidder has accepted all the conditions, stipulated in the tender specification, notwithstanding any exemptions mentioned therein.

10. **Right to reject/accept any tender**:

The purchaser reserves the right either to reject or to accept any or all tenders if the situation so warrants in the interest of the purchaser. Orders may also be split up between different Bidders on individual merits of the Bidder. The purchaser has exclusive right to alter the quantities of materials/ equipment at the time of placing final purchase order. After placing of the order, the purchaser may defer the delivery of the materials. It may be clearly understood by the Bidder that the purchaser need not assign any reason for any of the above action [s]

11. **Supplier to inform himself fully**:

The supplier shall examine the instructions to Bidders, general conditions of contract, specification and the schedules of quantity and delivery to satisfy him as to all terms and conditions and circumstances affecting the contract price. He shall quote price [s] according to his own views on these matters and understand that no additional allowances except as otherwise provided there in will be admissible. The purchaser shall not be responsible for any misunderstanding or incorrect information, obtained by the supplier other than the information given to the supplier in writing by the purchaser.

12. Patent rights Etc.

The supplier shall indemnify the Purchaser against all claims, actions, suits and proceedings for the infringement of any patent design or copy right protected either in the country of origin or in India by the use of any equipment supplied by the manufacturer. Such indemnity shall also cover any use of the equipment, other than for the purpose indicated by or reasonably to be inferred from the specification.

13. **Delivery:-**

[a] Time being the essence of the contract; the equipment shall be supplied within the delivery period, specified in the contract. The Purchaser, however, reserves the right to reschedule the delivery and change the destination if required. The delivery period shall be reckoned from the date of placing the Letter of Intent/Purchase order, as may be specified in LOI/Purchase order.

[b] The desired delivery period shall be as indicated at Annexure-III (Quantity & Delivery Schedule) & Appendix-II of Section-IV (Technical Specification).

14. Despatch instructions.

I] The equipments/materials should be securely packed and dispatched directly to the specified site at the supplier's risk by Road Transport only.

II] **Loading & unloading of Ordered Materials.**

It will be the sole responsibility of the supplier for loading and unloading of materials both at the factory site and at the destination site/store.

The Purchaser shall have no responsibility on this account.

15. **Supplier's Default Liability.**

[i] The Purchaser may, upon written notice of default to the supplier, terminate the contract in circumstances detailed hereunder.

[a] If in the judgement of the Purchaser, the supplier fails to make delivery of equipment/material within the time specified in the contract or within the period for which if extension has been granted by the Purchaser in writing in response to written request of the supplier.

[b] If in the judgement of the Purchaser, the supplier fails to comply with any of the provisions of this contract.

[ii] In the event, Purchaser terminates the contract in whole or in part as provided in **Clause-15 (i)** of this section, the Purchaser reserves the right to purchase upon such terms and in such a manner as he may deem appropriate in relation to the equipment/material similar to that terminated and the supplier will be liable to the Purchaser for any additional costs for such similar equipment/material and/or for penalty and/or forfeiture of performance security for delay as defined in **clause-22** of this section until such reasonable time as may be required for the final supply of equipment.

[iii] In the event the Purchaser does not terminate the contract as provided in **clause 15(I)** of this Section, supplier shall be liable to the Purchaser for penalty for delay as set out in **Clause-22** of this section until the equipment is accepted. This shall be based only on written request of the supplier and written willingness of the Purchaser.

16. **Force Majeure**:

The supplier shall not be liable for any penalty for delay or for failure to perform the contract for reasons of force majeure such as acts of god, acts of the public enemy, acts of Govt., Fires, floods, epidemics, Quarantine restrictions, strikes, Freight Embargo and provided that the supplier shall within **Ten (10)days** from the beginning of delay on such account notify the purchaser in writing of the cause of delay. The purchaser shall verify the facts and grant such extension, if facts justify.

17. Extension of time:-

If the delivery of equipment/material is delayed due to reasons beyond the control of the supplier, the supplier shall without delay give notice to the purchaser in writing of his claim for an extension of time. The purchaser on receipt of such notice may or may not agree to extend the contract delivery date as may be reasonable but without prejudice to other terms and conditions of the contract.

18. **Guarantee period: -**

[i] The stores covered by this specification should be guaranteed for satisfactory operation and against defects in design, materials and workmanship for a period of at least 60 [sixty] months from the last date of delivery/demonstration. The above guarantee certificate shall be furnished in triplicate to the purchaser for his approval. Any defect noticed during this period should be rectified/replaced by the supplier free of cost to the purchaser provided such defects are due to faulty design, bad workmanship or bad materials used, within one month upon written notice from the purchaser failing which provision of **clause 22 (ii**) shall apply. The guarantee period for the rectified/replaced equipment shall be further guaranteed for **60 months (sixty)** from the date of rectification/replaced.

[ii]Equipment/material failed or found defective during the guarantee period shall have to be guaranteed after repair/replacement for a further period of **60 months (sixty)** months from the date of commissioning or from the date of receipt at the store/site after such repair/replacement. The Bank Guarantee is to be extended accordingly. Date of delivery as used in this clause shall mean the date on which the materials are received in OPTCL'S stores/site in full & good condition which are released for Despatch by the purchaser after due inspection

19. B.G. towards security deposit, 100% payment and performance guarantee:

[i] For manufacturers situated inside & outside the state of Orissa.

A Composite Bank Guarantee as per the Proforma enclosed at Annexure-VII of the specification for 3**% [three percent]** of the total FORD cost of the purchase order, shall be furnished from any nationalized/scheduled bank having a place of business at Bhubaneswar, to the office of **Chief General Manager [Central Procurement Cell] OPTCL** within 30 days from the date of issue of the purchase order.

In case of successful bidder who is a Local (**In the state of Odisha**) Micro and small Enterprise (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC **(Registered in Odisha)** 3% (three percent)) of the FORD cost of the purchase order shall be furnished from any nationalized/scheduled bank having a place of business at Bhubaneswar, to the office of **Chief General Manager [Central Procurement Cell]** OPTCL within 30 days from the date of issue of the purchase order.

The BG shall be executed on non-judicial stamp paper worth of Rs.29.00 [Rupees twenty nine] only or as per the prevalent rules, valid for a period of **62 (sixty two)** months from the last date of stipulated delivery period, for scrutiny and acceptance, failing which the supply order will be liable for cancellation without any further written notices. The BG should be accompanied by a confirmation letter from the concerned bank and should have provision for encashment at Bhubaneswar, before the Bank Guarantee is accepted and all concerned intimated. The Composite Bank Guarantee shall be valid for **62(Sixty Two)** months from the last date of stipulated delivery period. The BG should be re validated as and when intimated to you to cover the entire guarantee period.

(ii) No interest is payable on any kind of Bank Guarantee.

[iii] In case of non-fulfillment of contractual obligation, as required in the detailed purchase order/Specification, the composite Bank guarantee shall be forfeited.

20. Import License

In case imported materials are offered, no assistance will be given for release of Foreign Exchange. The firm should arrange to import materials from their own quota. Equipment of indigenous origin will be preferred.

21.

(A) Terms of Payment. (Supply)

(i) 100% Taxable value of each consignment with 100% Goods and Service Tax in full as applicable will be paid on receipt of materials in good condition at stores/desired site and verification thereof, subject to furnishing and approval of Composite Bank Guarantee at the rate of 3% (Three percent) of Taxable value plus GST thereon, as stipulated under clause-19 of this specification & on prior approval of guarantee certificate & Test certificate by the Purchaser.

(B) Terms of Payment. (Erection, Testing & Commissioning)

(i) ERECTION, TESTING & COMMISSIONING OF MATERIALS:

90% (Ninety percent) of the erection price component (Taxable Value) with 100% Tax will be paid on progressive basis depending on the actual work done i.e. on completion of erection, testing and commissioning of the respective items and on certification of the same by the owner.

(ii) The balance 10% (ten percent) of the erection price component(Taxable Value) shall be paid within sixty (60) days after successful commissioning of the 0.2s Acc ABT compliant Energy meters and issuance of Taking over Certificate by the owner.

TDS as applicable shall be deducted from the Invoice Amounts.

(iii) Payment & Price-reduction for AMC shall be as per the details indicated under SECTION-V for AMC.

(D) Payment of Freight & Insurance charges.

Freight & Insurance Charges shall be quoted as inclusive in the Taxable Value.

(E) The supplier shall furnish Composite Bank Guarantee of appropriate amount to OPTCL covering 3% of Taxable value of the purchase order well in advance (within 30 days from the date of issue of the purchase order) before despatch of materials.

22. Price Reduction Schedule for Delay in Completion of Supply/Installation under Purchase Order/Contract

(i) If the Supplier fails to deliver the materials/equipment/installation within the delivery schedule, specified in the Purchase Order/Contract including delivery time extension, if any, granted with waiver of Price Reduction Schedule, the Purchaser shall recover from the Supplier, Price Reduction Schedule for a sum of half per cent (0.5 per cent) of the Taxable Value of the un-delivered equipment /materials for each calendar week of delay or part thereof. For this purpose, the date of receipted challan shall be reckoned as the date of delivery. The total amount of Price Reduction Schedule shall not exceed five per cent (5%) of the Taxable Value of the un-delivered equipment/materials. Equipment will be deemed to have been delivered only when all its components, accessories and spares as per technical Specification are also delivered. If certain components, accessories and spares are not delivered in time, the equipment/materials will be considered delayed until such time as the missing components, accessories and spares are delivered.

(ii) During the guarantee period, if the Supplier fails to rectify/replace the equipment/material within 30 days from the date of intimation of defect by the purchaser, then the Price Reduction Schedule at the rate of half percent (0.5%) of the Total Taxable Value for each calendar week of delay or part thereof shall be recovered by the purchaser. For this purpose, Price Reduction Schedule shall be reckoned from the 30th day from the date of issue of letter on defectiveness of equipment/material. The total amount of Price Reduction Schedule in this case shall not exceed 10% (TEN PERCENT) of the Purchase Order/Contract amount except GST (i.e. Total Taxable Value). If the defects, so intimated are not rectified or equipment/materials not replaced by the supplier within the guarantee period, then whole of the C.P.B.G. will be forfeited by the purchaser, without any intimation to the supplier.

iii) ***For A.M.C purpose the PRICE REDUCTION SCHEDULE shall be levied as per clauses indicated under SECTION-V elsewhere in the T.S.***

23. Insurance

The Supplier shall undertake insurance of stores covered by this Specification unless otherwise stated. The responsibility of delivery of the stores at destination in good condition rests with the Supplier. Any claim with the Insurance Company or transport agency arising due to loss or damage in transit has to be settled by the supplier. The Supplier shall undertake free replacement of materials damaged or lost, which will be reported by the consignee within 30 days of receipt of the materials at destination without waiting for the settlement of their claims with the carriers and underwriters.

24. **Payment Due from the Supplier**. All costs and damages, for which the supplier is liable to the purchaser, will be deducted by the purchaser from any money, due to the supplier, under any of the contract (s), executed with OPTCL.

25. **Compliance Rating under Goods and Services Tax and Balance sheet and profit & Loss Account:**

The following documents are to be submitted at the time of Tender Submission:

i. Compliance rating under Goods and Services Tax for immediate preceding financial year.

ii. Audited Balance Sheet and Profit & Loss Account of the bidder for the previous three years to assess the financial soundness of the bidder(s).

iii. GST registration certificate and PAN Card Copy, IT Return for last two years.

iv. Tax holiday/exemption certificate under GST or any other Act.

v. TDS exemption certificate under the Income Tax Act or any other act.

26. **Certificate of Exemption from Goods and Services Tax**.

Offers with exemption from Goods and Services Tax shall be accompanied with authenticated attested Photostat copy of exemption certificate. Any claim towards Goods and Services Tax shall be paid on actual basis subject to payment of GST by the supplier. In case Outward supply details of the supplier of Goods in GSTR-1 do not match with GSTR -2 of OPTCL on GSTN portal, the same will be adjusted through debit/credit advice issued by OPTCL under intimation to the supplier after allowing cooling period of 3 months after the date of supply.

27. **Contractors/Supplier's Responsibility**.

Notwithstanding anything mentioned in the Specification or subsequent approval or acceptance by the Purchaser, the ultimate responsibility for design, manufacture, materials used and satisfactory performance shall rest with the Bidders. The Supplier(s) shall be responsible for any discrepancy noticed in the documents, submitted by them along with the bid(s**).**

28. **Validity**

Prices and conditions contained in the offer should be kept valid for a minimum period of **180(one hundred eighty)** days from the date of opening of the tender, failing which the tender shall be rejected.

29. **EVALUATION.**

(I) Evaluation of bids for 0.2s accuracy class AC static ABT compliant trivector energy meter suitable for energy accounting/auditing & also interface meters will be on the basis of the FOR DESTINATION PRICE (By Road Transport) including Goods and Service tax & other levies as may be applicable. The FORD PRICE shall consist of the following components

a) Taxable Value- price.
b) Good and Services Tax
c) Other levies.
d) Mandatory spares, if any for maintenance of equipment. (At the discretion of the purchaser)
e) Test charges, if any.
f) Erection, testing and commissioning charges, if any.
g) Any other items, as deemed proper for evaluation by the purchaser.

h) Loading factors will be taken in to account during evaluation if the prices of some of the items not quoted.

(II) Evaluation for Erection, Testing & Commissioning of 0.2s accuracy class AC static ABT compliant trivector energy meter suitable for energy accounting/auditing & also interface meters.

(III) Evaluation of Bids for AMC of 0.2s accuracy class AC static ABT compliant trivector energy meter suitable for energy accounting/auditing & also interface meters shall be on the basis of Total (Full cost) basis.

(IV) Evaluation of bid for supply of metering panels suitable for accommodating 08nos of meters in each panel.

* *The Final Ranking of the eligible Bidders for supply, erection, testing, commissioning & AMC (7 years) of 0.2s accuracy class AC static ABT compliant trivector energy meter suitable for energy accounting/auditing & also interface meters along with supply of metering panels shall be on the basis of Total cost at (I) + Total cost at (II)+ Total cost at (III) +Total cost at (IV), as indicated above.*

(V) <u>Weightage shall be given to the Following factors in the Evaluation & Comparison of Bids.</u>

In comparing bids and in making awards, the Purchaser will consider other factors such as compliance with Specification, **minimum qualification criteria as per clause-30, outright rejection of tenders <u>clause-34</u> of this tender**, relative quality, adaptability of Supplies or services, experience, financial soundness, record of integrity in dealings, performance of materials/equipments/materials earlier supplied, ability to furnish repairs and maintenance services, the time of delivery, capability to perform including available facilities such as adequate shops, plants, equipment and technical organisation.

(VI) e-Reverse Auction process shall be resorted to in the tender as follows.

STRATEGY FOR E-REVERSE AUCTION	
1	Bidders are required to go through the guide lines given below and submit their acceptance to the same.
2	e-Reverse Auction (RA) will be conducted in e-tender portal of OPTCL on specified date and time, while bidders shall quote from their own offices/places of their choice. Internet connectivity shall be ensured by the respective agencies/bidders themselves.
3	Demonstration/ training (if not trained earlier) of bidder's nominated person(s), shall be done by KEONICS to explain all the rules related to e-Reverse Auction/ Business Rule document to be adopted.
4	The strategy to be used for reverse auction shall be "DYNAMIC TEMPLATE BIDDING"
Procedure for electronic Reverse Auctioning (e-RA):	
5	a. The e-RA shall be conducted on www.tenderwizard.com/OPTCL only. b. Bidder has to submit letter towards agreement to the Process related Terms & Conditions for e-Reverse Auction, as per (Reverse Auction Process Compliance Form at Annexure-IA). In non-receipt of the same, vendors will not be allowed to participate in e-RA. c. e-RA shall be carried out after opening of Price bids and completion of Price bid

	evaluation, which will be intimated only to the techno-commercially qualified bidders by OPTCL as per procedure given below. d. OPTCL reserves the right to conduct e-RA and it is obligatory on part of bidder(s) invited to participate in e-RA process once they have responded to the techno-commercial bid.
6	Prior intimation/ Notice for RA invitation will be given to techno-commercially qualified bidders regarding the date & time of opening of the e-RA. The start bid price (SBP) for e-Reverse Auction of each bidder under a particular package shall be the L1 evaluated price for the subject package including Taxes & Duties for the total scope for subject Package. Taking the above discovered L1 price as the upper limit e-RA will be conducted to determine the lowest possible price. Reverse Auction will be conducted amongst first 50% of the technically qualified bidders arranged in order of prices from lowest to highest, as L1, L2,L3----------Ln, and L1 price will be discovered. Minimum of 3 bidders shall be eligible for e RA. (eg. If 4 bidders are financially evaluated then the L1, L2 and L3 bidders shall be eligible for e-RA). Number of bidders eligible for participating in RA would be rounded off to next higher integer value if number of technically qualified bidders is odd (e.g. if 7 bids are technically qualified, then RA will be conducted amongst L1 to L4). However, in case only two bidders are found to be responsive, e-RA would be carried out with both the parties without any elimination. However, OPTCL reserves the right to invite the evaluated L1 bidder for negotiation without conducting the e-RA. In case of price submitted by any bidder is found to be abnormal, OPTCL reserves the right to reject the bid of the bidder(s) . Rank of bidders would be displayed as per the total cost to OPTCL, i.e including Taxes and Duties payable by OPTCL as per the provisions of the biding document & after e-RA process is over.
7	Names of bidders/ vendors shall not be disclosed during the e-RA process. Names of bidders/ vendors shall be anonymously masked in the e-RA process. (i) In case of RA, start/ reference price and step value of decrement shall be indicated to the bidders at the start of the auction. Any participating bidder can bid one or multiple step decrement lower than the prevailing lowest bid at that time. The Bidder shall be able to view Bid Start Price, Bid Decrement Value, Prevailing Lowest Bid value, last Bid Placed by him and time left for bidding. (ii) The step value of decrement in a package to be offered by bidder (the minimum amount of reduction in the total bid price including all taxes & duties during auction) , shall be kept at 0.15% of L1 bidder's final evaluated price (or) at approved amount as decided by OPTCL. (iii) Bidders can only quote any value lower than their previous quoted price. However, at no stage, increase in Price will be permissible. (iv) At any point during Reverse Auction, bidding Price field (Total price) shall remain enabled for the bidders. The total reverse auction period will be for one twenty (120) minutes. The initial auction period (1st slot) will be of thirty (30) minutes with provision of auto extension by (10) ten minutes from the schedule/ extended closing time, if any fresh lower bid is received in last ten minutes of initial auction period or extended auction period. Total/ maximum number of auto extension will be for 9 (nine) times after the 1st slot. After end of 120 minutes, the reverse auction process

	shall get closed automatically without any extension. (v) However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the period of e-reverse auction to avoid complication related with internet connectivity, network problem, system crash down, power failure etc.
8	After conclusion of e-Reverse Auction i.e (Closing Price in Reverse Auction will be taken as offered price by the L1 bidder), decrease in price of individual head of the template shall be considered proportionately on all individual line items of the respective head of the price schedule of the successful L1 bidder . Any bid received at the tender wizard server end subsequent to closure of the e-RA shall be summarily rejected and shall not be considered as a valid bid under whatsoever circumstances. For this purpose, tender wizard server log shall prevail. The bidder shall not involve himself or any of his representatives in price manipulation of any kind directly or indirectly by communicating with other bidders. During Reverse Auction, If no bid is received within the specified time, OPTCL, at its discretion, may decide to close the reverse auction process/ proceed with conventional mode of tendering [Evaluation of Part-II (price bid) submitted by bidders earlier].
9	Consequent upon completion of e-Reverse Auction, OPTCL's decision on award of contract shall be final and binding on the bidders. OPTCL shall be at liberty to call the L1 bidder for further process/ negotiation and also at liberty to cancel the e-reverse auction process/ re-tender at any time, without assigning any reason thereof. OPTCL can decide to reschedule or cancel any reverse auction: the bidders shall be informed accordingly. OPTCL/ Service Provider shall not have any liability to bidders for any interruption or delay in access to the e-Tender site/ Reverse Auction link irrespective of the cause.

30. Minimum Qualification Criteria of Bidders

The local (In the state of Odisha) MSE bidders shall be required to furnish their willingness to match their bid price with that of lowest evaluator bidder contract any price preference and in case they agree they shall be eligible to set up 30% of the tendered quantity to be distributed suitably among the willing MSE bidders failing which the said 30 % of the tender quantity be awarded to the lowest evaluated bidder.

QUALIFYING REQUIREMENTS

This section covers the requirements with respect to experience, capability and other particulars of the bidder to be considered eligible for participation in the bid for the proposed work. The BIDDER shall become eligible to bid on satisfying the following "BID QUALIFICATION REQUIREMENTS" and on production of the required documentary evidences along with the Tender.

1. The Bidder should be a Manufacturer Meters.
2. The Bidder must possess bureau of Indian Standard Certification (ISI mark) for meter manufactured in India and should be original manufacturer of 0.2 Class energy meter with LCD display & optical communication port.
3. Bidder should have minimum experience of **five years of supply** and manufacturing for 0.2 Class static energy meters up to end of the last financial year.
4. The bidder must possess valid ISO 9001:2008 certification for meter manufacturing.

5. The bidder shall have supplied minimum 1000 nos. of Class 0.2S Meters to different utilities in India in last five years and performance certificates of at least 500 nos. of energy meters shall be submitted with the bid towards satisfactory performance for at least two years of successful operation from the date of commissioning from different utilities.

6. Annual turn-over of the firm should not be less than Rs.200.00 (Rupees two hundred) Crores in each of the last three financial years. Audited Balance Sheet & profit and loss account for the same has to be attached.

7. The bidder shall have executed at least two Turnkey contracts of value each not less than 10 Crores in last five years involving Supply, Installation, Data Collection & Report Generation and Annual maintenance. Documentary evidence in support of the same shall be submitted with the bid.

NOTE: The offers of bidders not satisfying any of the above "bid qualification requirements" are likely to be rejected.

8. The Bidder should have conducted type tests on the tendered equipments/materials in Government approved laboratory within five years from the date of opening of the tender.

9. The Bidder should have adequate infrastructural facility for "After sales service".

10. Copies of documents, defining the constitution or legal status, place of registration and principal place of business of the company or firm or partnership or collaborator or parent Company etc. shall be furnished along with the bid.

11. Even though the Bidders meet the above qualifying criteria, they are subject to be disqualified if they have

i) Made misleading or false representations in the forms, statements and attachments, submitted in proof of qualification requirements and/ or

ii) Record of poor performance such as not properly completing the contract, inordinate delays in completion of supply, litigation history or financial failure etc.

12. Notwithstanding anything stated above, the purchaser reserves the right to assess the Bidder's capability and capacity to perform the contract within the scheduled time, should circumstances warrant such assessment in the overall interest of the Purchaser.

31. **Jurisdiction of the High Court of Odisha.**

Suits, if any, arising out of this contract shall be filed by either Party in a court of Law to which the jurisdiction of High court of Odisha extends.

32. **Correspondences.**

i) Any notice to the supplier under the terms of the contract shall be served by Registered Post or by hand at the Supplier's Principal Place of Business.

ii) Any notice to the Purchaser shall be served at the Purchaser's Principal Office in the same manner.

33. Official Address of the Parties to the Contract

The address of the parties to the contract shall be specified:-

[i] **Purchaser**: Senior General Manager (Procurement)(CPC) OPTCL Bhubaneswar-751022 (Orissa) Telephone No. 0674 – 2541801, FAX No.0674 – 2542964, email id; sgm.cpc@optcl.co.in

[ii] **Supplier:** Address Telephone No:- Fax No.

34. **Outright Rejection of Tenders**

Tenders shall be out rightly rejected if the followings are not complied with.

[i] The tenderer shall submit the bid in electronic mode only and shall submit the tender cost online on or before the scheduled date and time of submission of technical bid. In case of **Local (In the state of Odisha) Micro and small Enterprises** (MSEs) registered with respective DICs, Khadi, Village, Cottage & Handicrafts Industries, OSIC and NSIC participating in the tender they have to submit notarised hard copy of valid registration as Local **(In the state of Odisha)** MSE as above on or before the scheduled date and time of opening of technical bid.

[ii] The tenderer shall submit the bid in electronic mode only

[iii] The Tender shall not be submitted telegraphically or by FAX.

[iv] The Tender shall be kept valid for a minimum period of 180 days from the date of opening of tender.

[v] The Tender shall be submitted in two parts as specified.

[vi] The Tenders shall be accompanied by a list of major supplies affected prior to the date of opening of tender. Data of at least 5 (five) years shall be furnished.

[vii] The tenderer shall upload the scanned copy of latest type test certificates (for the tests, carried out on the tendered equipments, being offered). Such type tests should have been conducted within last five years from the date of opening of this tender in a Government approved laboratory/CPRI in presence of any Government Organization's representative(s).

[viii] The schedule of prices should be filled up fully to indicate the break-up of the prices including taxes and duties. Incomplete submission of this schedule will make the tender liable for rejection. Vide Clause-4(ii) of Part-II.

[ix] The Bidder should quote 'FIRM' price only and the price should be kept valid for a minimum period of 180 days from the date of opening of the tender.

[x] The Bidder shall upload the scanned copy legibly written user's certificate to prove the satisfactory operation of the offered equipments/materials for a minimum period of 2 (two) years from the date of commissioning/use as per the tender specification. User's certificate shall include the detailed address of the user with Equipment/Material, Name and type as per this specification, number of years of satisfactory use/operation & date of issue of this user's certificate with official seal written in English only & clearly visible must be furnished. At least one of the user's certificates shall be from state or Central Govt. or their Undertakings.

(xi) Guaranteed Technical particulars & Abstract of terms and Conditions should be filled in completely.

(xii) The bidder should not have any pending litigation or arbitration with OPTCL with regard to any project or related activity. The bidder should certify/declare the same in unequivocal terms by way of an **affidavit** duly sworn before a **Magistrate or Notary**. Bid furnished by the bidder shall **not be eligible** for consideration, if it is not accompanied by the affidavit. Further the bid/LOA/LOI shall be liable for **outright rejection/cancellation** at any stage if any information contrary to the affidavit/declaration is **detected.**

35. Documents to be treated as confidential.

The supplier shall treat the details of the specification and other tender documents as private and confidential and these shall not be reproduced without written authorization from the Purchaser.

36. Scheme/Projects

The materials/equipment covered in this specification shall come under "O&M WORKS & CONSTRUCTION WORKS"

37. EMPANELMENT OF BIDDERS:-

OPTCL may consider for empanelment of such Bidders and for such Equipments for which the Bidders will be found to be techno-commercially responsive against this Tender Specification. Such empanelment should be valid for a period of 02(two) years from the date of opening of techno-commercial bids against this Tender. During the above period, OPTCL may ask for price bids as and when required by OPTCL. The Bidders are required to give their consent in their offers against the above tender for such empanelment. However, the Bidders are to note that such empanelment is not binding on the purchaser and the purchaser is free to take any other decision under the prevailing circumstances in the interest of OPTCL.

38. CONTACTING THE PURCHASER: -

(a) Subject to Clause No.4 (opening of bids) of part-I, Section-I (Instruction to Bidder) No Bidder shall contact the purchaser on any manner, relating to its bid, from the time of bid opening to the time of the contract is awarded.

(b) Any effort by a Bidder to influence the purchaser's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidder's bid.

SECTION – III.

LIST OF ANNEXURES

[I TO XIII]

The following schedules and proforma are annexed to this specification and contained in Section-III as referred to in the relevant clauses.

1	Declaration form	ANNEXURE-I
1A	e-RA Declaration form	ANNEXURE-IA
2	Abstract of terms and conditions to accompany Section-II of Part-I	ANNEXURE-II
3	Schedule of Quantity and Delivery	ANNEXURE-III
4	Abstract of price component [to accompany Part-II of this specification]	ANNEXURE-IV
5	Schedule of prices to accompany Part-II	ANNEXURE-V
6	Bank Guarantee form for earnest money deposit	ANNEXURE-VI
7	Composite Bank Guarantee form for security deposit, payment and performance	ANNEXURE-VII
8.	Chart showing particulars of E.M.D.	ANNEXURE – VIII
9.	Data on Experience.	ANNEXURE – IX
10.	Schedule of spare parts.	ANNEXURE-X
11.	Schedule of Installations.	ANNEXURE-XI
12	Schedule of deviations (Technical)	ANNEXURE-XII (A)
12	Schedule of deviations (Commercial)	ANNEXURE-XII (B)
13	Litigation /Arbitration	ANNEXURE-XIII

ANNEXURE - I

DECLARATION FORM

To

The Sr. General Manager (CPC)
OPTCL Head Qrs.BBSR,751022

Sub:- Tender Specification No-_____

Sir,

1. Having examined the above specification together with terms & conditions referred to therein * I/We the undersigned hereby offer to supply the materials/equipments covered therein complete in all respects as per the specification and General conditions, at the rates, entered in the attached contract schedule of prices in the Tender.
2. * I/We hereby undertake to have the materials/equipments delivered within the time specified in the Tender.
3. * I/We hereby guarantee the technical particulars given in the Tender supported with necessary reports from concerned authorities.
4. * I/We certify to have submitted the bid electronically by remitting *cash/money order/D.D./ remitting the cost of tender, herewith and this has been acknowledged by your letter/ money receipt No. Dated,
5. In the event of Tender, being decided in *my/our favour, * I/We agree to furnish the Composite B.G. in the manner, acceptable to ORISSA POWER TRANSMISSION CORPORATION LTD., and for the sum as applicable to *me/us as per clause-19 of section-II of this specification within 15 days of issue of letter of intent/purchase order failing which *I/We clearly understand that the said letter of Intent/Purchase order will be liable to be withdrawn by the purchaser.

Bid Security Declaration

*I/We further declare that, we will not modify/withdraw the bid after opening of techno-commercial bid(i.e. part-I bid) during its validity period and in such an event we agree that OPTCL would be free to debar us from participating in the tenders floated by OPTCL for a period of three years .

Signed this day of 2021

Yours faithfully

Signature of the Bidder with seal of the company

[This form should be dully filled up by the Bidder and uploaded at the time of submission of tender.]

* (Strikeout whichever is not applicable)

(Reverse Auction Process Compliance Form) (Annexure-IA)

(To be submitted on letter head of the bidding company with sign and stamp and along with Technical bid)

To,
CGM (CPC), OPTCL
Bhubaneswar-751010, Odisha

Sub: Agreement to the Process related Terms & Conditions for e-Reverse Auction.

Dear Sir,

This letter is to confirm that:
• The undersigned is authorized representative of the company.
• We have studied the Commercial Terms and the Business rules governing the Reverse Auction as mentioned in your tender and confirm our agreement to that.
• We also confirm that we have gone through the auction manual and have understood the functionality of the same thoroughly.
• We, hereby, confirm that we will honour the Bids placed by us during the tendering/ e- Reverse auction process as called as e-RA.
• We also confirm that we will accept our Rank / Position that will be displayed when the Bidding Time for the Online Reverse Auction is over.

With regards,
with company seal Name & Address

Signature with Designation
Person having power of attorney for the subject package.

ANNEXURE- II

ABSTRACT OF GENERAL TERMS AND CONDITIONS OF CONTRACT [COMMERCIAL] TO ACCOMPANY PART-I

1	(a) OPTCL Money Receipt No. & Date towards purchase of Tender. (b**)** Bid Security Declaration in lieu of Earnest money furnished. **(A)** Bank Guarantee, **(B)** Bank Draft.	Yes/No
2	Manufacturer's supply experience including user's certificate furnished or not. [As per clause No.7 of Section-II.]	Yes/No
3	Deviations to the specification if any[list enclosed or not] [As per clause-9 of the Section-II] (a) Commercial (b) Technical.	 Yes/No Yes/No
4	**Delivery** (For Phase- I & II) Whether agreeable to OPTCL's terms [As per Delivery Schedule in Annx.-III of Section-III]	Yes/No
5	**Guarantee: -** Whether agreeable to OPTCL's terms. [As per clause-18 of Section-II]	Yes/No
6	Whether agreeable to furnish Composite B.G. in case his tender be successful [As per clause-19 of Section-II]	Yes/No
7.	**Terms of payment:-** Whether agreeable to OPTCL's terms or not [As per clause-21 of Section-II]	Yes/No.
8.	Nature of price:- FIRM	Yes/No
9.	**Price reduction schedule:-** Whether agreeable to OPTCL's terms or not (As per clause-22 of Section-II)	Yes/No
10.	Whether STCC/ P&L A/C, Balance Sheet for the required period are furnished as per clause-25 of Section-II	Yes/No
11.	**Validity: -** Whether agreeable to OPTCL's terms or not [As per clause-28 of Section-II	Yes/No
12.	Whether recent type test certificates from any Government approved laboratory are furnished or not. [As per clause-34[viii] of section-II]	Yes/No
13.	Whether guaranteed technical particulars in complete shape are furnished or not	Yes/No
14.	Whether dimensional design/drawings furnished or not	Yes/No
15.	Whether materials are ISI/ISO marked.	Yes/No
16.	Manufacturer's name and its trademark.	Yes/No
17.	Whether registered under GST Laws	Yes/No
18.	Whether declaration form duly filled in furnished or not.	Yes/No
19	Whether documentary evidence in support of two turnkey contracts as per clause-7 of qualifying requirement of GTCC furnished or not	Yes/No
20	Whether furnished documentary evidence in support of infrastructural facility for after sales service	Yes/No
21	Whether furnished all certificates as per Clause No-20.0 of Section-IV, Technical Specification.	Yes/No

Place: -
Date: -

Signature of the Bidder
with seal of the company

ANNEXURE-III

SCHEDULE OF QUANTITY AND DELIVERY

(To be filled up by the Bidder)

SL No	Description of materials	Phase	Quantity required	Desired Delivery Time	Destination	Remarks.
1	2	3	4	5	6	7
1	0.2S ACCURACY CLASS A.C STATIC ABT (DLMS) COMPLIANT (CATEGORY-B) TRIVECTOR ENERGY METER SUITABLE FOR ENERGY ACCOUNTING / AUDITING & ALSO INTERFACE METERS **(SUPPLY)**	I	157	Within 4 (Four) month from date of issue of Purchase Order		
2	METERING PANELS SUITABLE FOR ACCOMMODATING 08NOS OF ENERGY METERS IN EACH PANEL **(SUPPLY)**	I	60			
3	0.2S ACCURACY CLASS A.C STATIC ABT (DLMS) COMPLIANT (CATEGORY-B) TRIVECTOR ENERGY METER SUITABLE FOR ENERGY ACCOUNTING / AUDITING & ALSO INTERFACE METERS **(ERECTION-COMMISSIONING)**	I	157	Within 10 (Ten) months from the date of issue of Purchase Order.		

Place:

Date:

Signature of Bidder
with seal of Company

ANNEXURE-IV

ABSTRACT OF PRICE COMPONENT [TO ACCOMPANY PRICEBID]

1	Price basis	F.O.R. Purchaser's destination Stores/site.
2	Packing & forwarding	Inclusive in the Taxable Value
3	Rate of Insurance charges	Inclusive in the Taxable Value
4	Rate of Freight charges	Inclusive in the Taxable Value
5	Rate of Goods and Service Tax	
6.	Rate of Goods & Service Tax on erection testing and commissioning/AMC	
10.	Nature of price.	

Place
Date:

Signature of Bidder
With seal of company

NB: - Abstract of price component shall be done for equipment/material offered, for testing commissioning charges, if any. All the above prices will be taken during bid price evaluation.

ANNEXURE-V

1) SCHEDULE OF PRICES (Ref-Excel format) TENDER SPECIFICATION No.

Item Name	Item Description	Qty	UOM	Supply in INR Rs					
				Unit (Ex Works/ Basic) Price in Rs.	% GST	Unit GST	Unit Landing Cost	**(A)**Total Landing Cost	
1	2	3	4	5	6	7	8	9	

Erection cost in INR Rs				
Unit **Erection** cost in Rs	%GST in Rs	Unit **GST** in Rs	Unit Landing cost in Rs	(B) Total Landing Cost
10	11	12	13	14

ANNEXURE-V(a)

2) SCHEDULE OF PRICES TENDER SPECIFICATION No.

Year	Unit rate of AMC in Rs.	% GST	Unit GST (considering abatement applicable)	Total amount AMC in a year in Rs.
1st year				
2nd year				
3rd year				
4th year				
5th year				
6th year				
7th year				
			Grand Total	

NB: -

1. The Bidder should fill up the schedule properly and in full. The tender will be rejected, if the schedule of price is submitted in incomplete form. No post tender correspondence will be entertained on break-up of prices. Also the supplier should agree for delivery at sub-station site

2. In case, where F&I components are not specifically indicated in this schedule, 5% of the ex-works price shall be taken towards F&I components for the purpose of comparison of price.

3. The Bidder should fill up the schedule properly and in full. The tender will be rejected, if the schedule of price is submitted in incomplete form. No post tender correspondence will be entertained on break-up of prices. Also the supplier should agree for delivery at sub-station site

4. In case, where F&I components are not specifically indicated in this schedule, 5% of the ex-works price shall be taken towards F&I components for the purpose of comparison of price.

5. The Bidder shall certify in the price bid that MODVAT benefit, if any, has been fully passed on to the purchaser while quoting the tender price.
6. Conditional offers will not be acceptable.
7. The Bidder is to clearly indicate the period up to which the tax holidays are available to them.
8. Price bid in any other format will not be acceptable and the offer will be rejected.
9. Test charges (Routine/type) if any, mandatory spares, if any, maintenance equipment charges, if any, as per Technical Specification, supervisory charges, if any,(Supervision of erection & commissioning charges per equipment & the same charges per day) shall be indicated separately, row- wise.
10. All the above charges will be taken into account, during bid price evaluation.
9. Bidders are requested to attach the details of latest version equipment along with the Techno-commercial documents for comparison.
10. Bidders are requested to quote both for supply, Erection as well as AMC for ABT Compliant 0.2S Accuracy Energy Accounting and also Interface Meters scheme, failing which their Bids shall not be evaluated.

ANNEXURE-VI

PROFORMA FOR BANK GUARANTEE FORM FOR EARNEST MONEY DEPOSIT(Not applicable for this tender)

(To be Stamped in accordance with Stamp Act and the Non-Judicial Stamp Paper of appropriate value should be in the name of Issuing Bank)

Ref No: …….

Bank Guarantee No. …….

Date:……
BG Amount:……..
Validity Period:……..

This Guarantee Bond is executed this…… day of …… by us the…… Bank at …… , P.O…… , Dist……., State…… and Code No……..

Whereas the ODISHA POWER TRANSMISSION CORPORATION Limited, Janpath, Bhubaneswar, a company constituted under the Companies Act-1956 (hereinafter called OPTCL) has invited Tender vide e-NIT No……. Dated…… for the purpose of …… work under Package(s) No……../ purchase of ---------- .

1. Now, therefore, in accordance with Notice Inviting Tender (e-NIT) No…….. Dated …… of OPTCL, Ms/Shri……Address…….. Wish / wishes to participate in the said tender and as a Bank Guarantee for the sum of Rs……. [Rupees in ***words***---------- ----------] valid for a period of ……days is required to be submitted by the bidder, as per Tender Specification, we the _____) [indicate the name, Address & Code of the bank] [hereinafter referred to as "Bank"] at the request of Ms/Shri…….. [hereinafter referred to as "Bidder"] do hereby unequivocally and unconditionally guarantee and undertake to pay during the above said period on written request by the <Tender Issuing Authority, Central Procurement Cell (CPC) ODISHA POWER TRANSMISSION CORPORATION Ltd. , Bhubaneswar an amount not exceeding Rs……. to OPTCL., without any reservation. The guarantee would remain valid up to ……. [Date] and if any further extension to this is required, the same will be extended on receiving instruction from ---------- on whose behalf this Bank Guarantee has been issued.

2. We, the _____ [indicate the name of the Bank, Address, Code] do hereby further undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from OPTCL. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs…… (Rupees in words……)

3. We undertake to pay to OPTCL any money so demanded not withstanding any dispute or disputes so raised by the bidder in any suit or proceeding instituted/pending before any court or tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the bidder shall have no claim against us for making such payment.

4. We, the _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the aforesaid period of _____ days [in words]……. (as per Tender Specification) and it shall continue to be so enforceable till all the dues of OPTCL under or by virtue of the said Bid have been fully paid and its claims satisfied or discharged or till OPTCL certifies that the terms and conditions of the said Bid have been fully and properly carried out by the said bidder and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us or our Branch Office at Bhubaneswar <Mention Name, Address & Code of the Branch Office at Bhubaneswar of Issuing Bank> in writing on or before _____ we shall be discharged from all liability under this guarantee thereafter.

5. We the _____ Bank further agree with OPTCL that OPTCL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Bid or to extend time of performance by the said Bidder from time to time or to postpone for any time or from time to time any of the powers exercisable by OPTCL against the said Bidder and to forbear or enforce any of the terms and conditions relating to the said Bid and we shall not be relieved from our liability by reason of any such variation, postponement or extension granted to the Bidder or for any forbearance, act or omission on the part of OPTCL or any indulgence by OPTCL to the said Bidder or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so relieving us.

6 This guarantee will not be discharged due to the change in the name, style and constitution of the Bank and/or of the Bidder.

7 We _____ [indicate the name of Bank, Address &Code] lastly undertake not to revoke this guarantee during its currency except with the previous consent of OPTCL in writing .

8. We, the _____Bank (Name, Address & Code) further agree that this guarantee shall also be invokable at our place of business at ---------- Branch of **Bhubaneswar** (indicate Name, Address & Code of the Branch at Bhubaneswar) in the State of Odisha."

" Notwithstanding anything contained herein"

a) Our liability under the bank guarantee shall not exceed Rs.----------(Rupees in words----------) only.

b) This Bank guarantee shall be valid up to ----------.

c) We or our Branch at Bhubaneswar <Mention Name, Address & Code…….> shall be liable to pay guaranteed amount or any part thereof under this guarantee only if you serve upon us at--------- Branch of Bhubaneswar a written claim or demand on or before ……,

The Bank Guarantee is issued in paper form and Advice transmitted through SFMS with required details to the beneficiary's advising bank (ICICI Bank Bhubaneswar, IFSC Code ICIC0000061).

Dated, the _____Day of _____

For _____ [Indicate name of Bank]

Signature ……
Full name …….
Designation ……
Power of Attorney No. …….
Date…….
Seal of the Bank…….

WITNESS: (SIGNATURE WITH NAME AND ADDRESS)
(1)
Signature ……
Full name …….
(2)
Signature ……
Full name …….

N.B.:

1. The Unique Identifier for field 7037 is "OPTCL541405793"
2. Name of the Bidder.: ……
3. BG No & Date :……
4. Amount (In Rs.):……
5. Validity up to :……
6. E-NIT No……..
7. Package/Works No……..
8. Name, Address & Code of Issuing Bank:……
9. Name, Address & Code Bhubaneswar Branch of the Issuing Bank:……
10. The Bank Guarantee shall be accepted after getting SFMS advice as per details below.

Format for SFMS details

(The Unique Identifier for field 7037 is "OPTCL541405793")

Sl. No	PARTICULARS	TYPE	DETAILS
1	Type of Bank Guarantee	Mandatory	EMD
2	Currency & Amount	Mandatory	
3	Validity Period(from—to --)	Mandatory	
4	Effective Date	Mandatory	
5	End date of lodgment of Claim	Mandatory	
6	Place of lodgment of claim	Mandatory	Bhubaneswar, Branch Name------ of Bhubaneswar Branch code------- of Bhubaneswar Branch Address ------ at Bhubaneswar
7	Issuing Branch IFSC Code	Mandatory	
8	Issuing Branch name & address	Mandatory	
9	Name of applicant and its details	Mandatory	
10	Name of Beneficiary and its details	Mandatory	
11	Beneficiary's Bank/Branch and IFSC Code	Mandatory	ICICI Bank Ltd IFSC Code-ICIC0000061
12	Beneficiary's Bank/Branch name and address	Mandatory	ICICI Bank Ltd Bhubaneswar Main Branch, Bhubaneswar
13	Sender to receiver information	Mandatory	
14	Purpose of Guarantee	Mandatory	EMD
15	Reference/Description of the underlined tender/contract	Mandatory	NIT No

ANNEXURE-VII

PROFORMA FOR COMPOSITE BANK GUARANTEE FOR SECURITY DEPOSIT , PAYMENT AND PERFORMANCE

(To be stamped in accordance with Stamp Act and the Non-Judicial stamp paper of appropriate value should be in the name of the Issuing Bank.)

Ref No:- …….

Bank Guarantee No. …….

Date: ……
BG Amount:…….
Validity Period:……..

This Guarantee Bond is executed this…… day of …… by us the…… Bank at …… , P.O…… , Dist……, State…… and Code No……..

Whereas the ODISHA POWER TRANSMISSION CORPORATION Limited, Janpath, Bhubaneswar, a company constituted under the Companies Act-1956 (hereinafter called OPTCL) has issued Letter of Award (LOA) No…… Dated…… for the purpose of …… work under Package No……. (herein after called "the Agreement") to M/s/Shri …….. , Address…….. (herein after called the "Contractor") for supply, erection, installation & commissioning and associated civil works under the above LoA and whereas OPTCL has agreed (1) to exempt demand of security deposit under the terms and conditions of the LOA (2) to release payment of the cost of the Contract Price to the Contractor on furnishing by the Contractor to OPTCL a Contract Performance Bank Guarantee (CPBG) of the value of 3% of the Contract Price of the said Agreement.

1. Now therefore, in accordance with the terms and conditions of LOA No. _____ dated _____ for the due fulfillment by the said Contractor of the terms and conditions contained in the said agreement, on production of a Bank Guarantee for Rs._____ (Rupees_____) only, we the bank _____ [Indicate bank Name , Address & Code] (hereinafter referred to as "the Bank") at the request of M/s/Shri _____ contractor do hereby undertake to pay to OPTCL, an amount not exceeding Rs._____ (Rupees _____) only .

2. We, the _____ Bank [indicate the name of the Bank, Address & Code] do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from OPTCL. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____(Rupees---------- In Words).

3. We, the …… Bank also undertake to pay to OPTCL any money so demanded not withstanding any dispute or disputes raised by the Contractor in any suit or proceeding instituted / pending before any court or tribunal relating thereto, our liability under this present being absolute and irrevocable. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor shall have no claim against us for making such payment.

4. We, the _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the aforesaid period of _____ days and it shall continue to be so enforceable till all the dues of OPTCL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till OPTCL certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said contractor and accordingly discharges this guarantee.

   Unless a demand or claim under this guarantee is made on us or our Branch Office at Bhubaneswar <Mention Name, Address & Code of the Branch Office at Bhubaneswar of issuing Bank> in writing on or before …… (Date), we shall be discharged from all liability under this guarantee thereafter.

5. We, the _____ Bank [indicate the name of the Bank, Address & Code] further agree with the Board that OPTCL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Bid or to extend time or performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by OPTCL against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Bid and we shall not be relieved from our liability by reason of any such variation postponement or extension being granted to the said contractor(s) or for any forbearance, act or omission on the part of OPTCL or any indulgence by OPTCL to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so relieving us.

6. This guarantee will not be discharged due to the change in the name, style or constitution of the Bank and/or of the contractor(s).

7. We, the _____ Bank [indicate the name of the bank, Address & Code] lastly undertake not to revoke this guarantee during its currency except with the previous consent of OPTCL in writing.

8. We, the _____Bank (Name, Address & Code) further agree that this guarantee shall also be invokable at our place of business at **Bhubaneswar** (indicate Name, Address & Code of the Branch at Bhubaneswar) in the State of Odisha.

" Notwithstanding anything contained herein"

a) Our liability under the bank guarantee shall not exceed Rs.----------(Rupees in words----------) only.

b) This Bank guarantee shall be valid up to ----------.

c) We or our Branch at **Bhubaneswar** <Mention Name, Address & Code…….> shall be liable to pay guaranteed amount or any part thereof under this guarantee only if you serve upon us at--------- Branch of Bhubaneswar a written claim or demand on or before ……,

The Bank Guarantee is issued in paper form and Advice transmitted through SFMS with required details to the beneficiary's advising bank (**ICICI Bank Bhubaneswar**, IFSC Code ICIC0000061).

Dated, the _____Day of _____
For _____ [Indicate name of Bank]

Signature……..

Full Name…….

Designation……..

Power Of Attorney……..

Dated……

Seal of the Bank……..

WITNESS: (SIGNATURE WITH NAME AND ADDRESS)

1.Signature…….

Full Name…….

2. Signature…….

Full Name…….

N.B.:

1. (The Unique Identifier for field 7037 is “OPTCL541405793”)

2. Name of the Contractor.: ……

3. BG No & Date :……

4. Amount (In Rs.):……

5. Validity up to :……

6. LOA No……..

7. Package No……..

8. Name, Address & Code of Issuing Bank:……

9. Name, Address & Code of Bhubaneswar Branch of the Issuing Bank:……

10. The Bank Guarantee shall be accepted after getting SFMS advice as per details below.

Format for SFMS details

(The Unique Identifier for field 7037 is "OPTCL541405793")

Sl. No	PARTICULARS	TYPE	DETAILS
1	Type of Bank Guarantee	Mandatory	Contract Performance
2	Currency & Amount	Mandatory	
3	Validity Period(from—to --)	Mandatory	
4	Effective Date	Mandatory	
5	End date of lodgment of Claim	Mandatory	
6	Place of lodgment of claim	Mandatory	Bhubaneswar, Branch Name------ of Bhubaneswar Branch code------- of Bhubaneswar Branch Address ------ at Bhubaneswar
7	Issuing Branch IFSC Code	Mandatory	
8	Issuing Branch name & address	Mandatory	
9	Name of applicant and its details	Mandatory	
10	Name of Beneficiary and its details	Mandatory	
11	Beneficiary's Bank/Branch and IFSC Code	Mandatory	ICICI Bank Ltd IFSC Code-ICIC0000061
12	Beneficiary's Bank/Branch name and address	Mandatory	ICICI Bank Ltd Bhubaneswar Main Branch, Bhubaneswar
13	Sender to receiver information	Mandatory	
14	Purpose of Guarantee	Mandatory	Contract Performance
15	Reference/Description of the underlined tender/contract	Mandatory	LOA No----

ANNEXURE-VIII

CHART SHOWING PARTICULARS OF EARNEST MONEY DEPOSIT (Bid Security Declaration to be furnished by all bidders in lieu of EMD) FURNISHABLE BY BIDDERS

1.	Central and State Government Undertakings	Exempted
2.	All other inside & outside state units.	The amount of EMD as specified in the specification /Tender Notice in shape of bank guarantee /DD.

NB: - **REFUND OF E.M.D.**

[a] In case of unsuccessful Bidders, the EMD will be refunded immediately after the tender is decided. In case of successful Bidder, this will be refunded only after furnishing of Composite Bank Guarantee referred to in **clause No.19 of Section-II** of this specification.
Suits, if any, arising out of EMD shall be filed in a court of law to which the jurisdiction of High Court of Orissa extends.

[b] Earnest Money will be forfeited if the Bidder fails to accept the letter of intent/purchase order, issued in his favour or revises the bid price[s] within the validity period of Bid.

ANNEXURE-IX
DATA ON EXPERIENCE

[a] Name of the manufacturer.
[b] Standing of the firm as manufacturer of equipment quoted.
[c] Description of equipment similar to that quoted [supplied and installed during the last five years with the name of the organizations to whom supply was made].
[d] Details as to where installed etc.
[e] Testing facilities at manufacturer's works.
[f] If the manufacturer is having collaboration with another firm, details regarding the same and present status.
[g] A list of purchase orders, executed during last five years.
[h] A list of similar equipments/materials of specified rating, voltage class, Impulse level, short circuit rating, Designed, manufactured, tested and commissioned (at least for 500nos of 0.2S class DLMS compliant (Category-B) energy meters) which are in successful operation for at least two years from the date of commissioning with legible user's certificate. User's full complete postal address/fax/phone must be indicated. (Refer clause No.7 of the Part-I, Section-II of the specification).

Place:
Date:

Signature of Bidder
Name, Designation, Seal

ANNEXURE-X

SCHEDULE OF SPARE PARTS FOR FIVE YEARS OF NORMAL OPERATION & MAINTENANCE

SL. No	Particulars	Quantity	Unit delivery rate	Total price

Place:
Date:

Signature of Bidder
Name, Designation, Seal

ANNEXURE-XI

SCHEDULE OF INSTALLATIONS

Type of Meter	Rated Voltage	Place of installation and complete postal address	Year of commissioning

Place: -
Date

Signature of Bidder:
Name, Designation, Seal

ANNEXURE-XII (A)

Deviation from the condition of contract (Technical)

The tenderer shall enter below, deviation if any, from the conditions of contract as herein.

Sl. No.	Clause No. of Specification	Particulars of deviation

Date:
Place:

SIGNATURE OF TENDERER
NAME:
DESIGNATION:
(SEAL)

ANNEXURE-XII (B)

Deviation from the condition of contract (commercial)

The tenderer shall enter below, deviation if any, from the conditions of contract as herein.

Date:
Place:

SIGNATURE OF TENDERER
NAME:
DESIGNATION:
(SEAL)

ANNEXURE – XIII

LITIGATION HISTORY
Name of the Bidder:

Bidder should provide information on any history of litigation or arbitration resulting from contracts executed in the last five years or currently under execution.

Year.	Award for or against bidder	Name of client, cause of litigation and matter in dispute	Disputed amount (current value in Rs.)

Place: -
Date

Signature of Tenderer:

Name, Designation, Seal

PROFORMA OF EXTENSION OF BANK GUARANTEE

(To be stamped in accordance with Stamp Act and the Non-Judicial stamp paper should be in the name of the issuing Bank)

Ref No:- ……. **Date:- ……**

Sub: Extension of Bank Guarantee No. ……..for Rs. …… favouring yourselves, expiring on ……on account of M/s. ……. in respect of LOA No. …… dated ……. (hereinafter called original Bank Guarantee).

At the request of M/s. ……., we…… Bank, branch office at ……..and having its Head Office at …….. do hereby extend our liability under the above mentioned Guarantee No. ……. Dated ……..for a further period of ……..years / months/ days from ……. to expire on ……..,except as provided above, all other terms and conditions of the original Bank Guarantee No. …….. dated ……. shall remain unaltered and binding.

Please treat this as an integral part of the original Bank Guarantee to which it would be attached.

" Notwithstanding anything contained herein"

a) Our liability under the bank guarantee shall not exceed Rs.----------(Rupees in words----------) only.

b) This Bank guarantee shall be valid up to ----------.

c) We or our Branch at **Bhubaneswar** <Mention Name, Address & Code…….> shall be liable to pay guaranteed amount or any part thereof under this guarantee only if you serve upon us at--------- Branch of Bhubaneswar a written claim or demand on or before ……,

The Bank Guarantee extension is issued in paper form and Advice transmitted through SFMS with required details to the beneficiary's advising bank (ICICI Bank Bhubaneswar, IFSC Code ICIC0000061).
Dated this ..... Day of .....20..... at .....

For ……[Indicate name of the Bank]
Signature……

Full Name …….

Designation ……..

Power Of Attorney No……

Seal of the Bank…….

NOTE : i) SFMS advice as per details below.

Format for SFMS details

(The Unique Identifier for field 7037 is "OPTCL541405793")

Sl. No	PARTICULARS	TYPE	DETAILS
1	Type of Bank Guarantee	Mandatory	EMD/Contract Performance/ . . . .
2	Currency & Amount	Mandatory	
3	Validity Period(from—to --)	Mandatory	
4	Effective Date	Mandatory	
5	End date of lodgment of Claim	Mandatory	
6	Place of lodgment of claim	Mandatory	Bhubaneswar, Branch Name------ of Bhubaneswar Branch code------- of Bhubaneswar Branch Address ------ at Bhubaneswar
7	Issuing Branch IFSC Code	Mandatory	
8	Issuing Branch name & address	Mandatory	
9	Name of applicant and its details	Mandatory	
10	Name of Beneficiary and its details	Mandatory	
11	Beneficiary's Bank/Branch and IFSC Code	Mandatory	ICICI Bank Ltd IFSC Code-ICIC0000061
12	Beneficiary's Bank/Branch name and address	Mandatory	ICICI Bank Ltd Bhubaneswar Main Branch, Bhubaneswar
13	Sender to receiver information	Mandatory	
14	Purpose of Guarantee	Mandatory	EMD/Contract Performance/ . . . .
15	Reference/Description of the underlined tender/contract	Mandatory	NIT No/LoA No . . . . .

PART – II
PRICE BID

1. **PRICE:**

(i) Bidders are required to quote their price(s) for goods offered indicating they are 'FIRM'

(ii) The prices quoted shall be FOR Destination only at the consignee's site/store inclusive of packing, forwarding, Freight & Insurance.. The Bidder has to certify in the part one that Input Tax Credit benefit if any, has been fully passed on to the Purchaser, while quoting the tender prices.

(iii) Destination of Delivery of materials: Within the jurisdiction of Orissa and shall be intimated at the time of issuing of despatch clearance (**materials are likely to be delivered at EHT, Store, Mancheswar, BBSR).**

2. **INSURANCE:**

Insurance of materials/equipments/materials, covered by the Specification should normally be done by the Suppliers with their own Insurance Company unless otherwise stated. The responsibility of delivery of the materials/equipments/materials at destination stores/site in good condition rests with the Supplier. Any claim with the Insurance Company or Transport agency arising due to loss or damage in transit has to be settled by the Supplier. The Supplier shall undertake free replacement of equipments/materials/materials damaged or lost which will be reported by the Consignee within 30 days of receipt of the equipments/materials/materials at Destination without awaiting for the settlement of their claims with the carriers and underwriters.

3. **CERTIFICATE FOR EXEMPTION FROM GST:**

Offers with exemption from GST, if any, shall be accompanied with authenticated proof of such exemption. Authenticated proof for this clause shall mean Photostat copy of exemption certificates, attested by Gazetted Officers of State or Central Government.

4. **PROPER FILLING UP OF THE PRICE SCHEDULE:**

(i) (i) The Bidder should fill up the price schedule (Annexure-V &V (a) of Section-III) properly and in full. The tender may be rejected if the schedule of price is submitted in incomplete form as per clause-34 (ix) of Section-II of the Specification.

5. **NATURE OF PRICE INDICATED IN SPECIFICATION SHALL BE FINAL**.

The nature of price indicated in the Clause-13, Section – I of PART –I of the Specification shall be final and binding.

SECTION – IV
(A) TECHNICAL SPECIFICATION

FOR SUPPLY, ERECTION, TESTING & COMMISSIONING OF
0.2S ACCURACY CLASS A.C STATIC ABT & DLMS COMPLIANT TRIVECTOR ENERGY METER SUITABLE FOR ENERGY ACCOUNTING/AUDITING & ALSO INTERFACE METER,

1.0 SCOPE:

a) This specification covers the design, engineering, manufacture, assembly, inspection and testing before supply and delivery at site stores/ FOR destination of 0.2S accuracy class static EHT/HT tri-vector CT/ VT operated meters, along with other associated equipments, as per details given in this specification. The meters shall be used for Energy Accounting/Auditing and also as Interface meters in OPTCL System;

b) The energy metering system specified herein shall be used for tariff metering for bulk, intra-State energy accounting of Odisha., Static composite meter shall be installed at interface points as a self-contained device for measurement of power transmittals and certain other functions such as Voltage (V), Frequency (f), Active (W/Wh), Reactive (VAr/VArh) & Apparent(VA/Vah) energy exchanged in each successive **5 Minute DIP (Demand integration period) in which the following shall be automatically stored and the DIP shall be field configurable from 15 min to 5 min and vice versa**. All meters shall be compliant to IS 15959 and all statutory regulation (SAMAST compliance) as required under CERC/CEA/IEGC with its latest amendments, as detailed in the following paragraphs.

c) **The meters shall normally operate with the power drawn from the VT secondary circuits, without the need for any auxiliary power supply.**

d) The meters shall be suitable for communication with external device like modem, DCU, etc. which shall be able to communicate with CDCS for local/remote data transfer. The meter shall compulsorily have at least 1 optical port for taking reading through Hand Held Unit (HHU).

e) The meters shall be suitable for being connected directly to the Voltage Transformer (VT) secondary circuit having a rated secondary line-to-line voltage of 110V, and current transformers (CTs) having a rated secondary current of 1 A. Any further transformers/ transactions/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage switch yards. The reference frequency shall be 50Hz.

f) The number of meters to be installed and commissioned at each substation will be informed to the successful bidders. The meter shall be 3 phase 4 wire type, suitable for connection to 3 phase 4 wire solidly earthed system as well as 3 phase 3 wire balanced and un-balanced loads.

g) It is not the intent to specify completely herein all the details of the design and construction of material. The material shall, however, conform in all respects to the best industry standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser. The offered meters shall be complete in all respects including all components/accessories and all required software for effective and trouble free operation according to this specification. Such components, which have not been specifically

mentioned in this specification, but are required for trouble free operation and for final required output shall be deemed to be included within the scope of this specification and/or commercial order;

h) The meter shall comply with DLMS (Device Language Message specification) open protocol, Type-B (DLMS) for 0.2S class ABT Compliant Energy Meters and also IS:15959-Indian Companion Specification(ICS) with its latest amendments.

i) The Bidder shall also to carry out the installation of the meters and field testing as per the requirement of OPTCL and also the Annual Maintenance Work(AMC) of the Meters, so installed, for a period of seven years beyond the guarantee period, as specified in GTCC clause No.18;

j) The sealing and the type of seal for the Energy Meters shall be as per Clause-12 of Central Electricity Authority (Installation and Operation of Meters) Regulations,2006. A tracking & recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping & installation as per the above Regulation.

k) **The meters shall have provision for time synchronization locally & remotely and feature of auto-time synchronization through GPS.**

l) **All energy meters to have recording at 5-Min interval and frequency resolution of 0.01 HZ. They must be capable of recording voltage & reactive energy at every 5-Min.**

m) As per the ABT requirement, the following user requirements should be maintained:

1) The energy meter shall comply with DLMS open protocol and IS:15959 Indian Companion Specification with its latest amendments.

2) The computer installed in the substation, on the Substation Ethernet LAN should be able to download the energy meter data at the end of every pre-defined demand integration period as per the regulatory requirement;

3) The physical connectivity of the meter on to the sub-station LAN should be supported as part of connectivity features of the energy meter;

4) Open software component to be supplied by the bidders along with the meters, which would be compatible to the stipulation at Sl no. 37 of Annx-1 of technical specification (Windows with back ward compatible for last 5 years).

5) The energy meter data shall be secure & tamper proof. Provision shall be made for verifying the energy data for its correctness by stake holders of OPTCL;

6) The downloading of data from the energy meter through the open software should be accomplished instantly, so that the central server further download all interface meters' energy data, well before completion of immediate next demand integration period;

7) The energy meter shall be scalable & capable to retain energy data for 45 (forty five days**)** with demand integration period(DIP) and shall have provision to revise the DIP downward from present 05 minutes SIP (survey integration period).

8) Provision shall be made for downloading all the parameters for DLMS compliant B category energy meters (Instantaneous, Block load profile, Monthly load profile, Weekly load profile and Daily load profile parameters)

9) The Energy Meters shall have provision of 'Time of Day (TOD) Metering' and the Time of the Day Zones and the associated tariff slab shall be field-programmable;

10) The Energy Meters shall have the features to monitor/detect tamper and fraud.

11) Each meter must have an optical port on its front for tapping all data stored in its memory through HHU. In addition to the above each meter shall also be provided with a RS-485, Ethernet and USB port on one of its sides, from where all the data stored in the meter's memory can also be transferred to CDCS (through DCU), local computer and external storage. The overall intention is to tap the data stored in the meter's memories at a scheduled time from any of the above mentioned ports or any other means and transmit the same to a remote central computer using suitable means of communication. It shall be possible to securely download the Energy Meter data through an USB port via external storage thereby removing the requirement of a MRI (Meter Reading Instrument). It shall be ensured that data transfer through USB shall be unidirectional only i.e. from Meter to external storage device in an authentication process. Meter data shall be tamper-proof.

12) All meters shall be compatible with Optical port, RS-485 port, Ethernet port and USB all together at a time and communicate independently. It shall also be possible to obtain a print out (hard copy) of all data collected from the meters, using the local PC. Data collection from any local laptop/PC shall be possible by installing data collection software.

13) The bidder shall adhere to the appropriate security algorithm for encryption and decryption.

14) **The Bidder shall provide the necessary software with license key ,which would enable a local PC/ CDCS to:**

a) Accept the data from the Optical/Ethernet/WAN and store it in its memory in user defined formats (text, csv, xls, etc.) in a user-defined file name.

b) Polling feature along with a task scheduler to run the data downloading software at a pre-designated date and time repeatedly or by manually selecting a meter. File naming for such downloaded data should also be in user-defined format**.** A detailed activity log shall also be available for each downloading operation.

c) Upload/Import meter data (binary files) in the software for further processing. While uploading, there shall be provision to upload all selected files with single key-stroke.

d) Convert the binary file(s) to text file(s).There should be provision to select multiple files based on filename, convert all selected files with single key-stroke and store the text files in the same location where binary files are stored.

e) Print out in text format the data collected from one or more meters, starting from a certain date and time, as per operator's instructions.

f) Store the collected data in binary format, on a CD/Pen Drive. In addition to above, in general the software shall be able to convert Energy Meters data to existing format as well as in user defined tabular text (.prn) format as applicable.

15) The above software shall further ensure that absolutely no tampering (except erasing of complete data with password protection) of the collected metering data is possible during its handling by the PC. The software shall be suitable for the commonly available PCs, (Windows) and shall be supplied to Owner in a compatible form to enable its easy loading into the PCs available (or to be installed by the Owner/others) at the various substations.

16) Meter shall be provided with compatible software for Time Synchronization locally and remotely.

17) The successful bidder(s) shall also hand over all the required software for smooth functioning of the meters of the system (Data downloading, calculation through software to achieve the energy computation etc.) in line with the owner's requirement free of cost to the owner. If updating of software is required, it is also to be done by the successful bidder on free of cost. In case, any discrepancy (ies) is/are noticed for not getting required operation or data collection for calculation,

the bidder has to carry out of such rectification of the software on free of cost, till achieving the required operation.

18) The bidder shall ensure data integrity checks on all metered data received from data collection systems.

2.0 APPLICABLE STANDARDS & REGULATIONS:

Unless otherwise expressly modified and to the extent so modified as per this specification, the meters shall conform (for testing, performance and accuracy) in all respects to the following Indian/ International metering Standards with latest Amendments :

IEC 62052-11; 2003	**Electricity Metering equipment (AC) – General requirements, tests and test conditions – Part 11; metering equipment**
IEC 62053-21; 2003	**Electricity Metering equipment (AC)-Particular requirements – Part 21: Static Meters for Active Energy (Classes 1 & 2)**
IEC 62053-22; 2003	**Electricity Metering equipment (AC)-Particular requirements – Part 22: Static Meters for Active Energy (Classes 0.2 S & 0.5S)**
IEC 62053-23; 2003	**Electricity Metering equipment (AC)-Particular requirements – Part 23: Static Meters for Active Energy (Classes 2 & 3)**
IS 13779, 1999	**The relevant stipulation(s), if any, as per IS: 13779-1999 applicable to OPTCL's specified energy meters shall also be considered as a requirement.**
IS 14697, 1999	**AC Static Transformer operated Watt-hour and VAr-Hour Meters, Class 0.2S, 0.5S and 1.0 S and 1.0 S - Specification**
IS 11448: 2000	**Application Guides for AC Electricity Meters (First Revision)**
IS 12346: 1999	**Testing Equipment for AC Electricity Meters (First Revision)**
IS 15707:2006	**Testing, Evaluation, Installation and Maintenance of AC Electricity Meters - Code of Practice**
IEC 62056-21	**Electricity metering – Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange**
IEC 62056-31	**Electricity metering – Data exchange for meter reading, tariff and load control – Part 31: Use of local area networks on twisted pair with carrier signaling**
IEC 62056-41	**Electricity metering – Data exchange for meter reading, tariff and load control – Part 41: Data exchange using wide area networks: Public switched telephone network (PSTN) with LINK + protocol**
IEC 62056-42	**Electricity metering – Data exchange for meter reading, tariff and load control–Part 42: Physical layer services and procedures for connection-oriented asynchronous data exchange**
IEC 62056-46	**Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer HDLC protocol**

IEC 62056-47	**Electricity metering – Data exchange for meter reading, tariff and load control – Part 47: COSEM transport layers for IPv4 networks**
IEC 62056-51	**Electricity metering – Data exchange for meter reading, tariff and load control –Part 51: Application layer protocols**
IEC 62056-52	**Electricity metering – Data exchange for meter reading, tariff and load control –Part52: Communication protocols management distribution line message specification (DLMS) server**
IEC 62056-53	**Electricity metering - Data exchange for meter reading, tariff and load control – Part 53: COSEM application layer**
IEC 62056-61	**Electricity metering - Data exchange for meter reading, tariff and load control –Part 61: Object identification system (OBIS) For G, H, W, meters OBIS codes are specified in EN 13757-1 (CEN TC 294), interface objects are common**
IEC 62056-62	**Electricity metering - Data exchange for meter reading, tariff and load control - Part 62: Interface classes**
IS 15959	**IS 15959 with its latest amendments --Indian Standard "Data Exchange for Electricity Meter Reading, Tariff and Load Control" - Companion Specification.**
IEEE 830-1998	**IEEE Recommended Practice for Software Requirements Specifications.**
IS 12063	**For enclosure protection against ingress of dust, moisture & vermin.**
IS 9000	**For environment testing.**
IS 11731	**(FH-1 Category) for Polycarbonate cover**
ISO-75	**For test requirement of poly-carbonate cover.**
IS-11000 (Part-2/Sec-1), 1984	**For test requirement of poly-carbonate cover**
IEC-60695-10-2	**For test requirement of poly-carbonate cover**
CBIP Publication No.325, Jan'2015	**CBIP Guide on Static Energy Meter- Specifications & Testing**
Regulation	**CEA Metering Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006**

(i) When the equipment offered by the bidder conforms to standards other than those specified above, salient points of difference between standards adopted and the standards specified in this specification shall be clearly brought out in a separate schedule.

(ii) The equipment, meeting the requirements of other authoritative standards, which ensure equal or better quality than the standards mentioned above, also shall be considered. For conflict related with other parts of the specification, the order of priority shall be according to the following:

a) This technical specification;

b) Relevant applicable Indian Standards;

c) Relevant International IEC Standards;

In case of conflict related with communication protocol, the Indian Companion Specification (ICS) i.e. IS: 15959 with its latest amendments shall prevail upon.

(iii) The original copies of the above standards & any other relevant standard(s) required for the contract are to be supplied free of cost before execution of the work.

3.0 CLIMATIC CONDITIONS:

The meters to be supplied against this specification shall be required to operate satisfactorily and continuously under the following tropical conditions of hot, hazardous, humid, rust and fungus prone environment and shall be dust and vermin proof. Parts and surface, which are subject to corrosion, shall be provided with protective coating.

1. Max. ambient air temperature (°C) :: 55
2. Min. ambient air temperature (°C) :: 0
3. Average daily ambient air temp. (°C) :: 32
4. Max. Relative Humidity (%) : >95
5. Min. Relative Humidity (%) : 10
6. Max. Altitude above mean sea level (m) :: 1000
7. Average Annual Rainfall (mm) :: 1200
8. Max. wind pressure (Kg/Sq.m) :: 195
9. Isoceraunic level (days per year) :: 50
10. Seismic level (Horizontal Accn. in g) :: 0.3

4.0 PRINCIPAL TECHNICAL PARAMETERS:

Sl.No.	Item	Specification
1.	Type of Installation	Indoor
2.	VT Secondary rated (reference) voltage(V_r)	3x110/√3 V Phase to Neutral (3P-4W) or 3x110 V Phase to Phase (3P-3W) **(**as per requirement**)**
3.	CT secondary rated current (I_n)	1 Amp
4.	Maximum Current of the Meter(I_{max})	$1.2I_n$
5.	Short-time over-current capability of the meter with tolerance & duration	20 I_{max} (Tolerance 0% to -10%),0.5 Second
6.	System frequency	50HZ± 5%
7.	Earthing System	Solidly Grounded
8.	Specified Operating Voltage Range	0.8 to $1.1V_{ref}$
9.	Limit Voltage Range of Operation	0.7 to $1.2V_{ref}$
10.	Starting Current (% of Rated Current)	0.1(MAX.)
11.	Accuracy Class for Active Energy	0.2S
12.	Accuracy Class for Reactive Energy	0.2S
13.	Temperature Range(As per IS)	
	(i)Specified Operating Range	-10^0C to 55^0C
	(ii)Limit Range of Operation	-25^0C to 60^0C

	(iii)Limit Range for Storage & Transport	-10^0C to 70^0C
14.	Demand/Data Integration Period(DIP)	05 as well as 15 minutes (Programmable)
15.	Power Consumption at reference temperature & reference frequency	
	(i) Voltage Circuits	1.5W & 10VA/Phase (MAX.)
	(ii) Current Circuits	1.0 VA/Phase (MAX.)
16.	Measuring Range of the Meter	0.01 I_n to 1.2 I_n
17.	Power Factor	0.0 lag-Unity-0.0 Lead
18.	Type of Memory	Non-Volatile
19.	Maximum Permissible drift in the real time Clock	+/- 2 min./Year
20.	Communication Capability	Both by HHU & Remotely
21.	Communication Protocol Requirements	As per DLMS & IS:15959 (ICS)
22.	Provision of TOD Metering	YES
23.	Provision of Tamper & Fraud Monitoring	YES
24.	Provision of Self-Diagnostic Feature	YES
25.	AC Test Voltage(kV_{rms})	As per Table-3 of 62053-22@IEC:2003
26.	Impulse Test Voltage (kV_{peak})	6 KV as per IS-14697, IEC-62052-11 & CBIP 5.4.6.2 and above.
27.	Sampling Plan for Acceptance Test	As per ANNEX-E of IS:14697:1999

The meter should be suitable for working with above supply variations without damage and without degradation of its meteorological characteristics.

5.0 TECHNICAL REQUIREMENTS

5.1 POWER FACTOR RANGE

The metering system shall be suitable for full power factor range from zero (lagging) through unity to zero (leading). The metering module shall work as an active energy import and export along with reactive (lag and lead) import and export meter. The reactive energy can be measured in four quadrants. Errors for different power factors shall be as defined in IS14697.

5.2 POWER SUPPLY VARIATION:

The meter shall start and continue to register on application of 0.1% of rated current and shall safely withstand the unusual and abnormal system conditions. The meter shall be suitable to operate satisfactorily at 120 % of the rated VT secondary voltage applied continuously and 190 % of rated secondary voltage for 3.0 secs; 120 % of the rated CT secondary current applied continuously and 20 times (clause 9.2.3 of IS: 14697 and 7.2 of IEC: 62053) of the maximum current, applied for 0.5 seconds; without causing any damage or mal-operation to the meters.

5.3 ACCURACY:

Class of accuracy of the metering system shall be 0.2S for active as well as reactive energy measurement, which will meet the percentage error limits as stipulated at Table-4 of Clause No.8.1 of IEC 62053-22 / Table 11.1 of IS 14697:1999 (reaffirmed 2004).

(i) The accuracy of the meters shall not exceed the permissible limits of accuracy for a period of at least 10(Ten) years from the date of supply. In case any drift is noticed, which is beyond permissible limits, the Bidder shall re-calibrate the meter for correct accuracy and if re-calibration is not possible, the meter shall be replaced by a new meter without any extra cost;

(ii) Variation in percentage error due to Short-time Over Currents shall be as stipulated at Table-9 of Clause No.9.2.3 (Short-Time Over Current) of IS 14697:1999 (reaffirmed 2004);

(iii) Variation in percentage error due to Self-Heating shall be as stipulated at Table-10 of Clause No.9.4 (Influence of Heating) of IS 14697:1999 (reaffirmed 2004);

(iv) Variation in percentage error due to Other Influence Quantities (Voltage Variation, Frequency Variation, Phase Sequence, Wave Form, Voltage –Unbalance) shall be as stipulated at Table-13 of Clause No.11.2 (Limits of Error Due to Other Influence Quantities (Voltage Variation, Frequency Variation, Phase Sequence, Wave Form, Voltage –Unbalance) of IS 14697:1999 (reaffirmed 2004);

(v) Variation in percentage error due to Ambient Temperature Variation shall be as stipulated at Table-14 of Clause No.11.3 (Limits of Error Due to Ambient Temperature Variation) of IS 14697:1999 (reaffirmed 2004);

(vi) Provision may be made that once the accuracy is brought within limits, the adjustments should be ceased and it shall not be possible to change the calibration of meters at site.

(vii) The Bidders should note that required accuracy tests shall be conducted on the meters for both import and export mode and the corresponding test results are to be duly reflected in the test reports for approval by OPTCL.

5.4 POWER CONSUMPTION OF METER:

(i) **Voltage Circuit:** The active and apparent power consumption in each voltage circuit at reference voltage, reference temperature and reference frequency shall not exceed 1.5 Watt per phase and 10 VA per phase respectively.

(ii) Current Circuit: The apparent power taken by each current circuit at rated current, reference frequency and reference temperature shall not exceed 1 VA per phase.

5.5 STARTING CURRENT:

The metering module shall start registering the energy at 0.1% I_n (rated current) and unity power factor.

5.6 MAXIMUM CURRENT:

The rated maximum current of the metering module shall be 120% of the rated current.

5.7 The meter shall work accurately, irrespective of phase sequence of the main supply.

5.8 GENERAL CONSTRUCTIONAL REQUIREMENTS:

5.8.1 Meters shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions, so as to ensure especially:

I. Personnel safety against electric shock;
II. Personnel safety against effects of excessive temperature;
III. Protection against spread of fire;
IV. Protection against penetration of solid objects, dust and water (Meter shall conform to the degree of protection IP 51 of IS: 12063/IEC 62052-11 Clause 5.9) in normal working condition;

V. Salt Mist test as per IS-9000-11 / 1983 & IEC-60068-2-11 is to be conducted by the firm to conform protection against corrosion in presence of OPTCL's representative at the cost of the bidder.

VI. Immunity to external influencing factors.

All the materials and electronic power components used in the manufacture of the meters shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy. The meters shall be designed with application of specific integrated circuits. The electronic components shall be mounted on the printed circuit board using latest Surface Mount Technology (SMT) or better up-to-date Technology. All insulating materials used in the construction of meters shall be non-hygroscopic, non-aging and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating. The meters shall be immune to external influences like magnetic induction, vibration, electrostatic discharge, switching transients, surge voltages, oblique suspension and harmonics and shall conform to the standards mentioned in this specification, as applicable to Static Electrical Energy Meters for measurement of Active and Reactive Energy. The meter accuracy shall not be affected by AC / DC magnetic field up to 0.2 Tesla on all the sides of meter i.e. front, sides, top and bottom of the meter as per CBIP publication No. 325,January'2015. Under influence of any magnetic field (AC / DC / Permanent) above 0.2 Tesla, if the accuracy of the meter gets affected, then the same shall be recorded as magnetic tamper event with date & time stamping. The energy recorded during such tamper shall be registered in a separate register in addition to main register.

5.8.2 CONSTRUCTIONAL DETAILS:

5.8.2.1 METER CASE:

The meter shall have a case, which can be sealed in such a way that the internal parts of the meter are accessible only after breaking the seal(s). The cover shall not be removable without the use of a tool. The case shall be so constructed and arranged that any non-permanent deformation cannot prevent the satisfactory operation of the meter.

5.8.2.2 WINDOW:

If the cover is not transparent, one or more windows shall be provided for reading the display and observation of the operation indicator. These windows shall be of transparent material which cannot be removed undamaged without breaking the seal(s).

5.8.2.3 TERMINALS - TERMINAL BLOCK(S):

Terminals may be grouped in (a) terminal block(s) having adequate insulating properties and mechanical strength. In order to satisfy such requirements when choosing insulating materials for the terminal block(s), adequate testing of materials should be taken into account.

The material for the terminal block shall be capable of passing the test given in ISO 75 for temperature of 135°C and pressure of 1.8 MPa.

The holes in the insulating material which form an extension of the terminal holes shall be of sufficient size to accommodate the insulation of the conductors.

The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Screw connections

transmitting contact force and screw fixings which may be loosened and tightened several times during the life of the meter shall screw into a metal nut.

The current circuit conductors of a meter shall be connected to its current terminals inside the meter terminals block adopting any of the recommended methods given in Appendix F of the CBIP Publication No.325, January 2015, so as to ensure satisfactory durable and adequate contact surfaces between the conductors and the terminals.

Terminals with different potentials which are grouped close together shall be protected against accidental short circuiting. Protection may be obtained by insulating barriers. Terminals of one current circuit are considered to be at the same potential.

For all the purposes, the Meter shall be construed as "Draw out type"

All parts of each terminal shall be such that the risk of corrosion resulting from contact with any other metal part is minimized.
Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.
The internal diameter of terminal holes shall be as specified in Table 2 of CBIP Publication 325, January 2015.

5.8.2.4 TERMINAL COVER(S):

All connectivity terminals should be covered & sealed

5.8.2.4.1 METER COVER:

The meter cover shall be continuously & ultrasonically welded wherever feasible (without metallic body) with meter base from all sides. If the ultrasonic welding facility is available, the same has to be complied as per specification. Transparent poly carbonate cover to be used shall be unbreakable. Polycarbonate to be used shall be of high grade which shall conform to IS 11731 (FH-1 category) besides meeting the test requirement of heat deflection test as per ISO-75, glow wire test as per the IEC-11000(part 2/SEC-1) 1984 or IEC PUB, 60695-2-12, Ball pressure test as per IEC—60695-10-2 and Flammability Test as per UL-94 or as per IS-11731(Part-2) 1986. The casing should be dust, vermin and moisture proof to the degree of IP-51 as per IS: 12063. Bidder shall submit the test certificate to this effect.

5.8.2.4.2 CLEARANCE AND CREEPAGE DISTANCES

The clearances and Creepage distances of terminal block and those between the terminals and the surrounding parts of the metal enclosure shall be not less than the values specified in Table 3 of CBIP Publication No.325, January 2015, for voltages existing when operating under reference conditions.

The requirement of the impulse voltage test shall also be met.

5.8.2.5.1 For current circuits, the voltage shall be considered to be the same as for the related voltage circuit.

5.8.2.5.2 Clearance of minimum 3 mm shall be provided between incoming and outgoing terminals of the same phase.

5.8.2.5.3 For phantom loading test, the pressure terminals are required to be connected separately from the current terminals of the same phase.

5.8.2.5.4 The clearance between the terminal cover if made of metal, and upper surface of the screw when screwed down to the maximum applicable conductor fitted shall not be less than the

relevant values specified in Table 3 of CBIP Publication 325, January 2015. If the terminal cover is made of insulating material, the clearance shall not be less than 1 mm.

5.8.2.6 RESISTANCE TO HEAT AND FIRE:

The terminal block, the terminal cover and the meter case shall ensure reasonable safety against the spread of fire. They should not be ignited by thermal overload of live parts in contact with them. To comply therewith they must fulfill the tests, as specified in 5.2.4 of CBIP Publication 325, January 2015.

5.8.2.7 PROTECTION AGAINST PENETRATION OF DUST AND WATER:

The meter shall conform to the degree of protection IP 51 as per IS 12063.

5.8.2.8 DISPLAY OF MEASURED VALUES:

The information can be shown in an electronic display. The non-volatile memory shall have a minimum retention time of 10 years. Meter should have the facility of data displaying and downloading during power OFF position.

N.B.: Non-volatile memory means the storage device which can retain information even in the absence of power and battery backed memory shall not be considered as Non-Volatile Memory.

Meter is to be provided with an auto display scrolling facility, in addition to push button for displaying the data parameters .In the case of multiple values presented by a single display, it shall be possible to display the content of all relevant memories. When displaying the memory, the identification of each tariff parameter applied shall be possible. When the meter is not energized, the electronic display need not be visible.

5.8.2.9 OUTPUT DEVICE:

The meter shall have a test output device accessible from the front and capable of being read with suitable testing equipment. The operation indicator, if fitted, must be visible from the front.

For test output pulse may not be homogeneous, therefore the manufacturer shall state the necessary number of pulse count(s) to ensure measurement repeatability of at least 1/10th of limits of error at the different test points.

The resolution and homogeneity of the test output in the form of pulses or high resolution register, accessible on meter display or through external display, shall be sufficient to enable conduction of the starting current test in less than 10 minutes and accuracy test at the lowest load shall be completed with desired accuracy within 5 minutes.

The test period shall however, contain sufficient number of cycles to take care of Instantaneous power variation within a cycle.

5.8.2.10 POWER SUPPLY TO METER:

The power supply from VT circuit shall be from all the three phases, preferably equally, so as to ensure meter power supply even if anyone of the three phases of the potential supply, in case of 3 phase-3 wire and any one or two of the three phases or neutral of the potential supply, in case of 3 phase-4 wire is lost at a time.

In addition, there should have provision for auxiliary power supply to meter from the 230V AC & 220V DC for downloading meter data in absence of VT circuit.

5.9 MANUFACTURING ACTIVITIES:

Meter should be manufactured using SMT (Surface Mount Technology) components and by deploying automatic SMT pick and place machine and reflow solder process;

5.10 SEALING:

(a)Proper sealing arrangement (for front, rear and port etc.) shall be provided in metering system. All meters shall be sealed by the manufacturer at its works. In addition to the seal provided by the manufacturer at its works, the sealing of all meters shall be done as follows at various sealing points as per the standards:

b) Sealing is to be provided by the manufacturer where there is possibility of accessibility to the metering system and its external wires. A tracking and recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal.

c) Sealing to be done as per clause no. 12 of CEA (Installation & Operation of Meters) regulation, 2006. Patented polycarbonate Seals will be provided by OPTCL with its logo (OPTCL / GRIDCO) and unique serial number in each seal.

5.11 MARKING OF METER:

5.11.1 MARKING AND NAMEPLATES:

The marking on every meter shall be in accordance with IS 14697/ IEC62053-22.Every meter shall be marked with the following information and the marking shall be indelible, distinct and readable from outside the meter:

i) Manufacturer's name and/or trade-mark and place of manufacture;
ii) Serial Number;
iii) Year of manufacture;
iv) Type & Designation;
v) Number of phases and wires;
vi) Meter constant;
vii) Principal unit in which the meter records;

viii) Reference voltage :

Type of meter	Method of marking	Example
3 phase, 4 wire	3 X voltage between line and neutral	63.5V or 110/√3

ix) Current :

Type of meter	Method of marking	Example
3 phase, Transformer operated, In 1 A	Rated Current	1 A

x) Reference temperature;
xi) Transformation ratio(s);
xii) Connections, Diagrams and Terminal Marking;
xiii) Sign of Double Square for insulating encased meters, if of protective class II;
xiv) ISI Mark with license;
xv) Reference frequency in Hertz (Hz);
xvi) Accuracy Class;
xvii) Phase sequence for which it is intended;

xviii) Property Of “Purchaser name”;
xix) P.O. No (“Number”) & Date;
xx) Any other parameter if applicable as per relevant standards.

5.12 CONNECTION DIAGRAM:

The connection diagram of the metering module shall be shown on inside portion of the terminal cover via suitable means. The meter terminals shall be properly marked.

5.13 METER CONNECTION & SAFETY:

5.13.1 The meters shall be suitable for being connected directly through its terminals to VTs having a rated secondary line- to- line voltage of 110 V & Line to Earth voltage of 63.5 V, and to CTs having a rated secondary current of 1A. Any further transformers/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage switch yards.

5.13.2 While installing the meter, it should be possible to check the correctness of CT, VT connections to the meter and their polarity from the functioning of the meter for different voltage indications. For this purpose, suitable software for field diagnosis of the meter connections with the help of the meter and meter reading instrument and/or directly by PC shall be supplied by the successful bidder(s).

5.14 The active energy measurement shall be carried out on 3 phase, 4 wire principle with an accuracy as per class 0.2S of IEC 62056-22 / IS 14697. The meters shall compute the active energy and load import; active energy and load export from the substation bus bars during each successive 05 minute integration period block and store it in its non- volatile memory.

5.15 I) The meter shall compute the average frequency during each successive DIP and store in its non-volatile memory. The frequency data shall be stored in the meter’s memory in Hertz up to minimum second decimal & no rounding off to next higher decimal digit. No rounding off to the next higher last decimal shall be done for voltage displays.

Ii) Data security shall be ensured as per IS 15959 (three layers of security).

5.16 MEASUREMENT:

1) The whole system shall be such as to provide a print out (both from the local PC, and from remote central computer) of the following similar .prn format for 05 minutes as well as 15 minutes DIP (Demand integration period) :

Tariff+ Series Meter Readings

Meter Serial No.

Date & time of read from Meter

Serial	CLEM	
OPT01954	M6X3G0A	
Meter Time	Time of read	Setting of meter time
Good	1st Oct 2018 11:29hrs	
Tariff Upload status	Authenticity	
	OK	

Current Values

Tariff Nam	OPTCLABT			
Time of Bi	N/A			
Date of Bi	N/A			
Cause of t	Unknown			
Channel 1	25608550 x 1k	W imp		
	Rate	MD Time	MD	Cumulative MD
Reg 0	18792750	1st Oct 2018 06:15	5428	66796
Reg 1	6815500	1st Oct 2018 00:15	6360	54408

Current Cumulative W import value

Billing Point 1

Tariff Name	OPTCLABT			
Time of Billing Action	00:00h			
Date of Billing Action	1st Oct 2018			
Cause of billing action	Auto			
Channel 1 unit registe	25551650 x 1k	W imp		
	Rate	MD Time	MD	Cumulative MD
Reg 0	18772550	19th Sep 2018 19:30	8652	66796
Reg 1	6778800	14th Sep 2018 05:15	6992	54408
Reg 2	------	---------- -----	-------	-------
Reg 3	------	---------- -----	-------	-------
Reg 4	------	---------- -----	-------	-------
Reg 5	------	---------- -----	-------	-------
Reg 6	------	---------- -----	-------	-------
Reg 7	------	---------- -----	-------	-------
Reg 8	------	---------- -----	-------	-------
Reg 9	------	---------- -----	-------	-------
Reg A	------	---------- -----	-------	-------
Reg B	------	---------- -----	-------	-------
Reg C	------	---------- -----	-------	-------

Monthly Final Date & Time

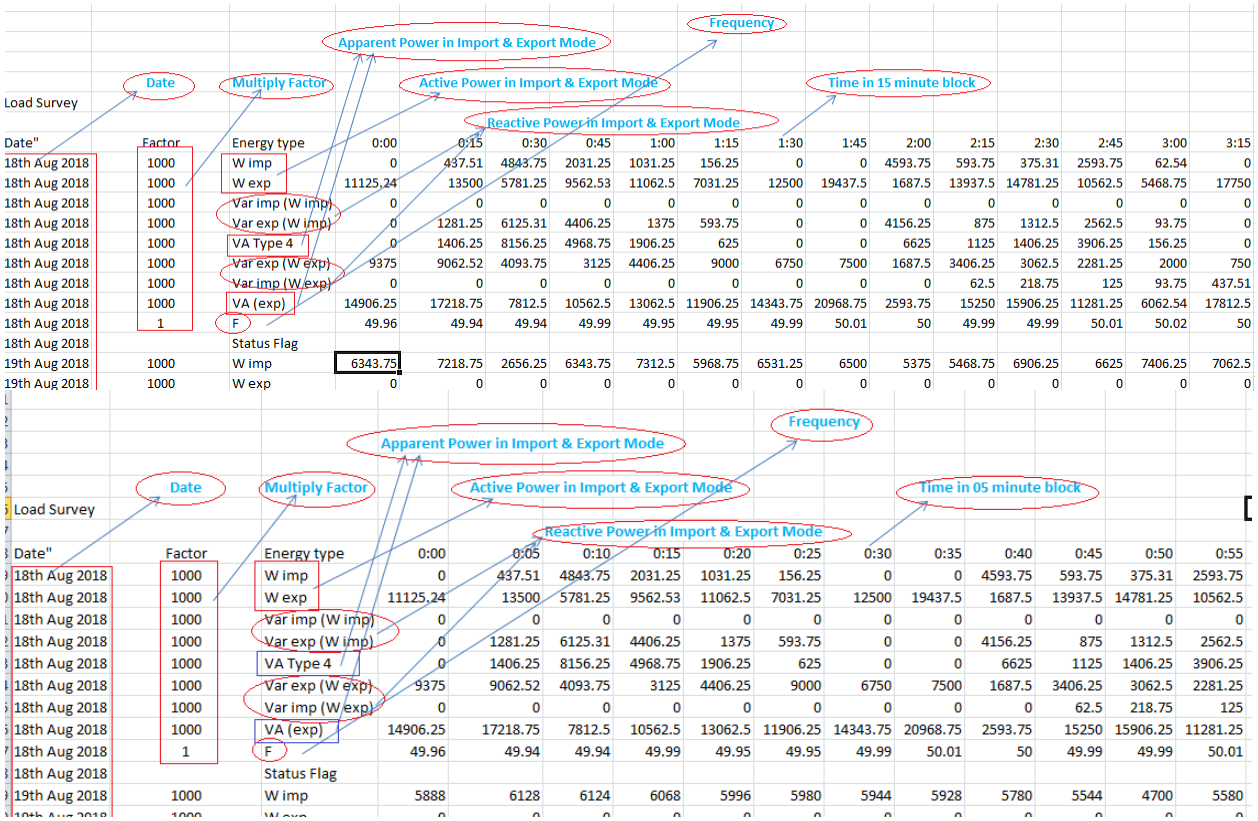
Monthly Final Cumulative W import value

Billing Point 2

Tariff Name	OPTCLABT			
Time of Billing Action	00:00h			
Date of Billing Action	1st Sep 2018			
Cause of billing action	Auto			
Channel 1 unit registe	21914050 x 1k	W imp		
	Rate	MD Time	MD	Cumulative MD
Reg 0	16113850	17th Aug 2018 20:00	8088	58144
Reg 1	5799900	12th Aug 2018 00:15	6700	47416
Reg 2	------	---------- -----	-------	-------
Reg 3	------	---------- -----	-------	-------
Reg 4	------	---------- -----	-------	-------
Reg 5	------	---------- -----	-------	-------
Reg 6	------	---------- -----	-------	-------

Monthly Initial Date & Time

Monthly Initial Cumulative W import value



There are 9 values in one 15 minutes time block. The first row shall contain the time block for 24 hours, i.e. 24 time blocks, 00 hrs to 23:45 hrs. Similarly the 2nd row to 10th row shall contain the energy data values in 15 min block and henceforth.

Similarly, other format for 5-minute block, there are 9 values in one 05 min time block. The first row shall contain the time block for 24 hours, i.e. 24 time blocks, 00 hrs to 23:45 hrs. Similarly the 2nd row to 10th row shall contain the energy data values in 05 min blocks and henceforth.

The above data shall be available in text file format (file extension as per IEEE standard/.txt/.prn) exportable to Excel(.csv). Indication of time retard or advance to be provided without disturbing the proposed format. Each 15-min as well as 5-min block data consists of Active Power Imp (in kW by multiply with factor), Active Power Exp (in kW by multiply with factor),four values of Reactive Power (Imp & Exp in kVAr by multiply with factor), two values of Apparent Power (Imp & Exp in kVA by multiply with factor) & Frequency (in HZ).

All 15 min as well as 05 min. block wise kW, kVAR & kVA figures in .PRN report shall be rounded off upto second digit. If 3rd digit right to decimal in Meter Level is 5 or higher then 2nd digit to decimal will be incremented by 1 and if 3rd digit right to decimal is below 5 then there will be no change in 2nd digit in PRN report while rounding up to 2nd decimal.

2) The meter shall continuously compute the average of the RMS values of the three line-to-neutral VT secondary voltages as a percentage of 63.51 V, and display the same on demand. The accuracy of the voltage measurement/computation shall be at least 0.5%, a better accuracy such as 0.2% in the 95-105% range being desirable.

3) The meter shall compute the reactive power on 3-phase, 4-wire principle, with an accuracy of 0.2S, and The meter shall also integrate the reactive energy (VARh) algebraically into two separate registers, one for the period for which the average RMS voltage is above 103.0%, and the other for the period for which the average RMS voltage is below 97.0 %. The current reactive power (VAR), with a minus sign if negative, and cumulative reactive energy (VARh) readings of the two registers (>103% and <97%) shall be displayed on demand. The readings of the two registers at each midnight shall also be stored in the meter's memory. When reactive power is being sent out from substation bus bars, VAR display shall have a plus sign or no sign and VARh registers shall move forward. When reactive power flow is in the reverse direction, VAR display shall have negative sign and VARh registers shall move backwards. Generally, the standard PT ratios are 33 kV/110 V, 132 kV/110 V, 220 kV /110 V and 400 kV /110 V. However, at the time of commissioning the vendor may confirm the same from site and configure the meter accordingly to ensure correct recording of reactive energy.
The meter shall be compatible with ABT and TOD tariff.

5.17 Further, the **reactive energy** shall also be available in four different registers as-

i. Reactive import while active import
ii. Reactive import while active export
iii. Reactive export while active import
iv. Reactive export while active export.

5.18 **Active and Apparent energy** shall also be made available by meter in separate energy registers as

i. Active energy Import
ii. Active energy Export
iii. Apparent energy (while active import)
iv. Apparent energy (while active export)

5.19 Meter shall have provision to compute apparent energy based on lag only or lag plus lead. The same shall be configured at factory end.

5.20 For **reactive power** and **reactive energy measurement**, limits of errors in all the four quadrants shall be in accordance with 0.2S accuracy class.

5.21 Pulse LED output to be provided for Active & Reactive Energy. It shall be possible to check the accuracy of energy measurement of the meter in the field by means of LED output on meter. This LED shall be visible from the front side.

5.22 TIME ACCURACY :

Each meter shall have a built-in calendar and clock, having an accuracy of 10 seconds per month or better. The calendar and clock shall be correctly set at the manufacturer's works. The date (year-month-day) and time (hour-min.-sec.) shall be displayed on the meter front on demand. **Meter shall have the intelligence to synchronize the time with GPS (Local GPS/CDCS GPS/ NAVIC) signal and from PC using software .** Limited time synchronization through meter communication port shall be possible at site. When an advance or retard command is given, **twelve subsequent time blocks shall be contracted or elongated by five seconds each**. All clock corrections shall be registered in the meter's memory and suitably shown on print out of collected data.

5.23 TOD (TIME OF DAY REGISTERS):

The meter shall have TOD registers for active energy import and export, apparent energy import and export and apparent MD import and export. Maximum eight times of day registers including universal (0-24 hrs) register can be defined. It shall be possible to program for redefining of existing time zones, adding of new time zones and redefinition of the zones, number of TOD registers and TOD timings through suitable high level software & or MRI as an authenticated transaction. Such high level software shall be supplied by the manufacturer for each energy meter.

5.24 MAXIMUM DEMAND (MD) REGISTRATION:

The meter shall continuously monitor and calculate the average demand of configured parameter during the integration period set and the maximum, out of these shall be stored along with date and time when it occurred in the meter memory. The maximum demand shall be computed on fixed block principle. The maximum registered value shall be made available in meter readings. Integration logic shall be such that the integration time remains consistent with real time clock and are set every 05 minutes, which shall be capable to change to other integration period(15 minutes DIP) suitably through high level software and shall not be linked with Power ON/OFF. Such high level software shall be supplied by the manufacturer for each energy meter.

5.25 MAXIMUM DEMAND RESET:

Following provisions shall be available for MD reset in meter –

(i) Auto billing at predefined date and time.

(ii) Manual via common MD reset button (optional)

(iii) Authenticated transaction through suitable high level software/ MRI (optional)

5.26 The display shall indicate direct values (i.e. without having to apply any multiplying factor) of measured/ computed parameters as per the meter commissioning. It shall be possible to easily identify the single or multiple displayed parameters through legends on the metering system display. The graphical display shall be capable to show vector diagram, harmonics & other display parameters. The register shall be able to record & display starting from zero, for a minimum of 1500 hours, the energy corresponding to the rated maximum current at reference voltage & unity power factor. The register shall not roll over in between this duration. In case the FIRM can't provide display on the meter, then they have to provide software to down load the phasor diagrams, harmonics & other parameters as specified in the specification.

5.27 Each of the metering modules (**ABT Compliant**) shall display on demand the following quantities/parameters:

The meter shall display the required parameters in two different modes

COMPUTE APPARENT ENERGY BASED ON – LAG +LEAD

TOD TIMINGS FOR MD & ENERGY

FOR ACTIVE & APPARENT ENERGY IMPORT & EXPORT

06:00 Hrs to 24:00 Hrs

24:00 Hrs to 06:00 Hrs

MD IMPORT / EXPORT

06:00 Hrs to 24:00 Hrs

24:00 Hrs to 06:00 Hrs

N.B. The above parameters are programmable as per this specification.

5.28 LOAD SURVEY:

Each metering module shall have a non-volatile memory in which the following shall be automatically stored for each successive DIP (Demand integration period):

1. Real Time Clock, date & time
2. Average Frequency
3. Voltage – VRN, VYN, VBN
4. Active Energy Import
5. Active Energy Export
6. Apparent while active Import
7. Apparent while active Export
8. Reactive Energy –Q1
9. Reactive Energy –Q2
10. Reactive Energy –Q3
11. Reactive Energy –Q4
12. Line Current –L1,L2,L3
13. Power Factor

For Conversion of these meter data in editable format, the above load survey parameters and also all the event information shall be available in the same editable file, i.e. (text(.prn), csv & xml). **05-minute average** of the above parameters shall be available for last forty five (45) days. It shall be possible to select either energy or demand view at Base Computer Software (BCS) end. The load survey data shall be available in the form of **bar charts** as well as in **spread sheets**. The BCS shall have the facility to give complete time synchronized load survey data both in numeric and graphic form.

5.29 Billing parameters *&* Energy accounting/ auditing: The predefined date and time for registering the billing parameters shall be 00.00 hours of the first day of each calendar (billing) month. Each meter shall store the following parameters corresponding to defined bill dates for up to last six (6) months:

i. Active Energy Import
ii. Active Energy Export
iii. Apparent while active Import
iv. Apparent while active Export
v. Reactive High Energy
vi. Reactive Low Energy
vii. Maximum Demand Apparent (Active Import)
viii. Maximum Demand Apparent (Active Export)
ix. Reactive Energy –Q1
x. Reactive Energy –Q2
xi. Reactive Energy –Q3
xii. Reactive Energy –Q4

5.30 Daily midnight parameters: The metering modules shall store following end day parameters for last forty five (45) days:

i. Cumulative Active Energy Import
ii. Cumulative Active Energy Export
iii. Reactive Energy High (V>103%)
iv. Reactive Energy Low (V<97%)
v. Cumulative Apparent Energy While Active Import
vi. Cumulative Apparent Energy While Active Export
vii. Cumulative Reactive Energy –Q1
viii. Cumulative Reactive Energy –Q2
ix. Cumulative Reactive Energy –Q3
x. Cumulative Reactive Energy –Q4

5.31 DATA COMMUNICATION CAPABILITY:

The metering system shall have multiple communication ports for local reading & remote communication facility and also as provided under "***SCOPE".***

**** Refer details under Clause 1.0 SCOPE, sub clause "j".***

The metering system shall have multiple communication ports for local reading and remote communication facility. Meter shall have an optical (IEC 1107) galvanically isolated communication port on its front for tapping all the data stored in its memory. Meter reading instrument (MRI) shall be used for the purpose of local meter reading via this optical communication port. MRI shall serve as the interface between meter and PC loaded with Base Computer Software. It shall also be possible to download meter data via this port by connecting laptop computer directly. The overall intention is to tap the data stored in meter once on daily basis, weekly basis and monthly basis and transmit the same to PC with BCS for view and print.

The meter shall comply with DLMS (Device Language Message specification) & **IS 15959(ICS)** with its latest amendments for open protocol for 0.2S class Energy Meters. The meter shall have Ethernet port (RJ45) for reading the meter over DLMS. Meter shall have RS 485 (in & out) for online monitoring (MODBUS)/meter reading (DLMS) which shall be used for remote access through suitable Modem.

The metering system shall provide a compatible to RS-485 port for online data transfer to a central location. This port shall be capable of data transfer to a main computer on real time basis using suitable communication network (GPRS/ GSM/ EDGE/ CDMA/ PSTN/ VSAT/ Leased line/ OFC) via compatible hardware (interfacing equipment/ communication cables etc. as required). MODBUS RTU protocol shall be implemented over RS-485 port. **In addition to the specified communication ports, USB port to be provided exclusively for meter data downloading purpose.**

5.32 Each meter shall have a unique identification code i.e. serial number, which shall be marked on name plate as well as in its memory. Further, all meters of the same model shall be totally identical in all respects except for their unique identification codes.

5.33 i) The meters shall safely withstand the usual fluctuations arising during faults etc. In particular, VT secondary voltages 115% of Vref applied continuously and 190% of Vref for 3.0 seconds, and CT secondary current 150% of Iref applied continuously and 30 times of Iref applied for 0.5 seconds shall not cause any damage to or maloperation of the meters. Further, meter shall be immune to external influences like magnetic induction, vibration,

electrostatic discharge, switching transients, surge voltages, oblique suspension and harmonics as per CEA Metering Reg.- 2006.

ii) The meters shall continue to function for the remaining healthy phase(s), in case one or two phases of VT supply fails. In case of a complete VT supply failure, the computation of average frequency shall be done only for the period during which the VT supply was available in the DIP. Any time block contraction or elongation for clock correction shall also be duly accounted for.

5.34 The meters shall be capable of withstanding voltage dips and short interruptions. Voltage dips and short interruptions should not produce a change of more than X units in the register and the test output shall not produce a signal equivalent of more than X units.
The value of X is derived from the following formula.

$X = 10^{-6}\ m V_n\ I_{max}$

Where

m	=	No. of measuring elements,
V_n	=	Reference Voltage in Volts,
I_{max}	=	Maximum current in amperes

5.35 The meter should be capable of storing all the 45 days data as specified for category "B" type DLMS compliant meters.

5.36 All the registers and other parameters shall be updated every second in the Energy Meters.

5.37 i) The total burden imposed by a meter for measurement and operation shall be defined as per IS 14697. An automatic backup for continued operation of the meter's calendar-clock, and for retaining all data stored in its memory, shall be provided through a long-life battery, which shall be capable of supplying the required power for at least 2 years. The meters shall be supplied duly fitted with the batteries, which shall not require to be changed for at least 10 years, as long as total VT supply interruption does not exceed two years.

One long-life replaceable type battery (Specification to be provided by the Bidder) is to be provided for reading through Display and Optical Port in absence of power supply. The battery mounting shall be designed to facilitate easy battery replacement without affecting PCB of the meter.

Ii) The meters shall fully comply with all stipulations in IS 14697 except those specifically modified by this specification. The reference ambient temperature shall be 27°C.

5.38 Meter shall have the capability and facility to compensate for errors of external measurement transformers i.e. CT and VT:

I. Linear compensation for VT errors (ratio and phase displacement):
There shall be linear adjustment, which shall be applied across the complete measurement range of the voltage transformer.

II. Non-linear compensation for CT errors (ratio and phase displacement):
This shall allow multiple ratio and phase adjustments, to be applied for different load points per phase input of the meter.
It shall be possible to program the errors of CT and VT in meter through front optical communication port, using compatible high level software (To be supplied by the successful

Bidder for each Meter). Metering system design should support this feature and further, it shall be possible to configure & incorporate this feature in meter at a later stage, whenever required.

5.39 The meter shall be Draw-out type with automatic CT secondary shorting feature, so as to ease the testing/replacement of meters without disturbing the system.

5.40 EXCEPTION MANAGEMENT :

The three line-to-neutral voltage shall be continuously monitored and in case any of these falls below defined threshold (70% of Vref), meter shall have suitable indication on LED/ LCD. The meter shall also have provision for low voltage event logging in meter memory in case of any phase voltage going below a defined threshold. The time blocks in which such a voltage failure occurs/persists shall also be recorded in the meter's memory with a symbol"*" if 3 Phase RMS voltage applied to the IEM is in between 5% to 70% of Vref **and if Voltage is less than 25% of Vref, meter should record Zero voltage symbol "Z".**

5.41 APPLICATION OF ABNORMAL VOLTAGE/FREQUENCY:

The accuracy of meter should not get affected with application of abnormal voltage/ frequency; as per relevant/ latest IS/ IEC.

5.42 EFFECT OF ABNORMAL MAGNETIC INDUCTION:

In the event of logging of abnormal Magnetic Induction/RF interference with date and time, the meter shall record at I_{max} as per IS-14697. At all other points where meter does not record at I_{max}, it should record correct energy. The Tamper will be recorded if it persists for three minutes and shall be restored after three minutes. The actual time of occurrence and either of actual time of removal of tamper or actual duration of tamper will be indicated in the Event data.

6.0(A) EVENT DETECTION FEATURES:

The meter shall have features to detect and log the occurrence and restoration of following abnormal events, along with date and time of event:

I. **Missing Potential** : In case, the voltage component in any (in 1 or 2 phases) phase is made zero, power computed by measuring element for corresponding phase(s) becomes zero & the energy recording is less by one/two phase(s).

Logic for detection:

i) If the voltage is absent and current is present, the logic senses a possible tamper condition, and examines the next possibility to reconfirm itself;

ii) If current and voltage both are missing then this could also be a system condition, hence not recorded as a tamper;

iii) If however voltage is less than Vth (Where Vth is the threshold value of voltage set for the tamper), and line current is more than Lth (Where Lth is the threshold value of the line current), the condition is recognised as a tamper, but it is logged as a tamper only if it passes the next logic step;

iv) If this tamper condition persists for a pre-defined persistence time, the event is finally logged as a tamper. Once this tamper is logged, the corresponding tamper count is incremented.

Restoration:

Tamper is restored when voltage restores to more than the preset restoration threshold value. The normal voltage value (i.e. the restoration voltage value) is now monitored, and if it remains above this value for a predefined persistence time, the tamper is considered as restored.

II. **Invalid Voltage:** The meter shall be able to detect and log invalid phase configuration of the voltage when the voltage angles are not within the specified range.

Logic for detection:

If voltage is more than Vth & if voltage angles are not valid & such condition persists for more than predefined persistence time, then the event to be recorded as tamper & tamper count to be incremented.

Restoration:

Tamper is restored when voltage angles restores to original values for more than the pre-set restoration threshold value for a predefined persistence time.

III. **Voltage Imbalance:**

Logic for detection:

(i) Compute voltage imbalance with respect to maximum voltage ;

(ii) Check if imbalance is more than the threshold value set for Voltage Imbalance ;

(iii) Monitor the condition for persistence time and log tamper event & increment in tamper count.

Restoration:

The restoration logic is similar to that defined for other types of tampers – i.e. restoration of normal conditions for a pre-defined persistence time.

IV. **Current Reversal:** In case, current polarity in one of the terminals is reversed, it is possible that the current vector will move beyond 90^{o} with respect to the Voltage vector. This vector position is used by the meter to identify a "Current Reversal" tamper. However, as the system conditions may coincide with the reverse current condition, to eliminate the possibility of system condition as Current Reversal tamper, a fourth sensor in the form of an internal CT is to be used inside the meter to sense a neutral unbalance current. Under this circumstance vector sum of the current in 3-phases and the neutral current determines the abnormality in current circuit.

Logic for detection:

i. Check normal 3 phase voltage;

ii. Check if any current has a different polarity;

iii. Check if line current is more than $L_{th;}$

iv. Check if the 4^{th} CT flag has been set;

v. Check if power factor is more than 0.1;

vi. Check whether these conditions persist for persistence time;

vii. Log occurrence of event as tamper and increment tamper count.

Restoration:

If the current again returns to original polarity for the pre-defined persistence time, then log restoration of event.

The above logic is for illustration purpose. However, the bidders are requested to identify appropriate logic for detection of CT reversal Event in our above specified Meters, having provision for both Import & Export metering facility so as to detect actual current reversal in Import and Export conditions. The appropriate logic for the same shall be enumerated by the Bidder in the Additional Technical Particulars format, annexed to this specification.

V. **Current Circuit open:**

As genuine no load conditions are not really tampers, the condition has to be recognised by the meter for detecting this tamper. A 4^{th} sensor (4^{th} CT in neutral) is necessary for detecting this type of tamper.

Logic for detection:

(i) Normal three phase voltages are present;
(ii) Now, if vector sum of currents is not zero;
(iii) And, difference in current is more than Lth;
(iv) Then, the 4th CT flag is internally set by the meter;
(v) Check if none of the current is negative (from vector position);
(vi) Check whether line current is less than Lth open;
(vii) Check whether this condition persists for persistence time, then record "current open" occurrence event;
viii) Increment the tamper count for "current open".

Restoration:

(i) For restoration, check if the 4th CT flag is reset;
(ii) Check whether average line current is more than Lth;
(iii) Check if these restoration conditions persist for the pre-defined persistence time;
(iv) Log the event as a "current open" restoration event.

VI. **Current circuit Bypass:**

Logic for detection:

(i) The meter first checks if normal three phase voltages are present;
(ii) The current vectors are summed, and the meter checks if the difference is more than Lth;
(iii) The meter first checks all logics for current reversal and current open tampers. If they are not, then.....
(iv) If the condition persists for persistence time, the event is logged as a "current bypass" tamper & the tamper count is incremented;

Restoration:

When the occurrence condition is restored, the restoration event is logged after persistence time has elapsed.

VII. **Current Imbalance :**

Logic for detection:

(i) Check normal three phase voltage;
(ii) Check if line current is more than L^{th};
(iii) Check if current imbalance is more than I_{mbth};
(iv) Check whether these conditions persist for a predefined persistence time;
(v) Log occurrence of event as a tamper & increment tamper count.

Restoration:

Tamper is restored when the current imbalance becomes less than threshold value for a predefined persistence time.

VIII. **Neutral Disturbance:** Neutral related tampering is done by tampering with the neutral at source side i.e. before the meter. Disturbances like DC voltage or HF signals may be superimposed on neutral wires causing disturbance to the metering process. This Event may reduce the energy recording or stop the functioning altogether. Provisions shall be made to detect such disturbances and isolate the neutral connection internally in the meter, and continue to record normally by creating an artificial neutral.

N:B-The meter shall be capable of detecting & recording tamper events as mentioned below Irrespective of provision of 4th CT in the neutral of the Meter.

Current Reversal:
Current Circuit Open:
Current circuit Bypass:
Neutral Disturbance:

IX. **Meter "POWER OFF" :**

If all three phases are below Vth, then only, it will be called as "Power Off". If only one or two phase(s) is/are below Vth, then, it will not be defined as "Power Off", but will be termed as "Phase Missing" or "Current without Volts".

Following conditions shall be taken care of for Event Logics as per IS; 15959 & other IS/IEC with latest amendment, as applicable.:

a. During Neutral disturbance tamper, all voltage related tampers (i.e. Voltage Failure, Voltage Unbalance, High Voltage & Low Voltage) shall not be logged;
b. During High Voltage & Low Voltage tampers, Voltage unbalance tamper shall not be logged;
c. During Voltage failure Tamper, Voltage Unbalance & Low Voltage tamper shall not be logged;
d. During current failure Tamper and Current Bypass Tamper, Current Unbalance tampers shall not be logged;
e. During current bypass Tamper, Current fail Temper and Current Unbalance tampers shall not be logged;
f. During power failure duration, if any tampers persisting, those tampers shall not get recovered until it meets the logic for restoration and duration of respective tamper shall be from occurrence of that tamper irrespective of power failure duration;
g. In case more than one tamper exists simultaneously, then meter will record all the tamper with date and time of occurrence;
h. For tamper events logging, snap shot data i.e. instantaneous parameters, active energy register reading (Total kwh) and date & time should correspond to starting of occurrence and starting of restoration;
i. Snap shot of date and time should be available for occurrences and restorations of events;
j. Last hundred (200) events (occurrence + restoration) in total, shall be stored in the meter memory on first in first out basis;

k. The above Tampers shall be 'roll over' type except 'Meter Cover Open', event as per this specification;
l. Tamper details shall be stored in non-volatile memory for retrieval either through Standalone-systems/PCs/Laptops/HHU/CMRI or/and remote access through suitable communication network;
m. The meter shall give error message on display, in case tampering occurs or meter malfunctions;

6.0 (B) There shall be four separate compartments for logging of different type of Events:

Compartment No.1	60 events for Voltage related
Compartment No.2	60 events for Current related
Compartment No.3	60 events for other related
Compartment No.4	20 events for Power failure

Once one or more compartments have become full, the last event, pertaining to the same compartment shall be entered and the earliest (first one) event should disappear. Thus, in this manner, each succeeding unusual event shall replace the earliest recorded event, compartment wise. Events of one compartment/ category should overwrite the events of their own compartment/ category only. Event count should increase as per occurrence of abnormal events. Total no. of counts shall be provided on BCS.

NOTE: Bidders are required to fill up the Additional Technical Particulars as per ANNEX-III to this Technical Specification in respect of Threshold Voltage Value & Current. Threshold Values (tamper event wise) along with persistence time and restoration time as per their experience and R&D shall be quoted so as to detect correct/actual tamper conditions instead of fictitious and system condition-related events. The value for the above said parameters will be decided after interaction with successive Bidder(s) during finalization/approval of drawing/Technical clearance.

6.0 (C) ANTI-TAMPERING FEATURES:

a) The meter shall not get damaged or rendered non-functional, even if, any phase and neutral are interchanged;
b) The meter shall register energy, even when the return path of the load current is not terminated back at the meter and in such a case the circuit shall be completed through the earth. In case of metallic bodies, the earth terminal shall be brought out and provided on the outside of the case;
c) The meter shall work correctly, irrespective of the phase sequence of supply;
d) The meter shall keep working even in the presence of any two wires i.e., even in the absence of neutral and any one phase or any two phases;
e) The registration must occur whether input phase or neutral wires are connected properly or they are interchanged at the input terminals;
f) The meter shall be factory calibrated and shall be sealed suitably before dispatch.
g) The meter shall work satisfactorily under presence of various influencing conditions like External magnetic field, Electromagnetic Field, RF interference, Harmonic Distortion, Voltage/Frequency Fluctuations, and Electromagnetic High Frequency fields etc.

7.0 SELF DIAGNOSTIC FEATURE:

The meter shall be capable of performing complete self-diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data in memory location all the time. The meter shall have indications for unsatisfactory/ nonfunctioning/ malfunctioning of the followings:

(i) Time calendar
(ii) Nonvolatile memory
(iii) RTC battery
(iv) Real time clock
(v) All display segments

The above malfunctioning(s) should be flagged in the meter memory and should be made available in the meter reading data.

8.0 HISTORICAL DATA RECORDING:

Meter shall be capable of recording in its Non-Volatile Memory (NVM) historical data consisting of billing energy, demand, TOD registers, power on/off Hrs. Minimum of six such data sets shall be stored and it shall be possible to retrieve these data through communication port on to common meter reading instrument (CMRI) or directly to PC using suitable software.

9.0 PHASOR DIAGRAM (Refer Cl.6.21 of CBIP Publication No. 325.)

9.1 REPRESENTATION OF PHASOR DIAGRAM:

It should show correct phasor diagram of the instantaneous parameters in the Base Computer Software (colour) and display (Colour/Black with R, Y, B Phase Notation).

(1) The Phasor diagram should be drawn taking R Phase voltage as reference. The location of R phase voltage will be fixed;
(2) Phasor diagram has colour option, R phase voltage/ current should be represented with red colour, Y phase voltage/ current should be represented with yellow colour, B phase voltage/ current should be represented with blue colour;
(3) The Phasor diagram should be drawn clockwise i.e. the sequence of voltage vectors should be R-Y- B under standard and correct wiring condition. This representation will be called as forward sequence. Forward sequence would also include sequence like Y-B-R, B-R-Y;
(4) In case voltage applied across meter terminals is in order of R-B-Y, or Y-R-B, or B-Y-R, the representation will be called as reverse sequence;
(5) Phasor diagram should also calculate actual angle of each parameter i.e., Vy, Vb and three currents with respect to Vr. The angles should be over 360 degree range;
(6) Bidder should clarify whether Phasor diagram would be formed even if only two phases with Neutral are present in a three phase meter. In case Vr is not available, then Vy will be reference;
(7) Phasor Diagram during Event snapshots should be recorded in the memory which can be retrieved, as and when required.

9.2 1) Meter serial no.
2) Meter Date-Time

3) Meter Type
4) Voltage in all three phases
5) Line current in all three phases
6) Active Current in all three phases
7) Reactive Current in all three phases
8) Power factor in all three phases
9) Signed Active Power—(+Forward, -Reverse) in all three phases
10) Total active Power
11) Total Reactive Power
12) Total Apparent Power
13) Average Power factor
14) Phase sequence
15) Frequency
16) Angle between 'R' & 'Y' phase
17) Angle between 'R' & 'B' phase

10.0 PROGRAMMABLE PARAMETERS:

1. Real time clock, Date & Time
2. Demand integration Period
3. Block Capture Time
4. Billing Date & Time
5. MD reset date along with MD Type
6. TOD Programming (1 to 8)
7. External CT/PT ratios
8. Events/Tampers
9. Time Synchronisation

Provisions shall be made to program the above parameters at site, using CMRI, Laptop or using Base computer software from remote station with proper security system. Logging of programmable parameter changed event (date & time) along with display of the same under On Demand Display Parameters & snapping of billing data at that time shall be stored and can be retrievable with CMRI, RMR and Laptop.

11.0 GUIDELINES FOR SOFTWARE PROTECTION FOR ENERGY METERS:

11.1. VERSION DETAILS

Meter firmware version should be available on meter display / meter rating plate. Also in downloaded data in order to have proper traceability of features available in the meter.

11.2. BCS & CMRI BACKWARD COMPATIBILITY

As and when the manufacturer releases new modified versions of meter, Base Computer Software & MRI software should be made available for supporting the same. In case, any software provided by meter manufacturer needs further approval/license, it is the responsibility of the manufacturer to provide the same till the meters are in use. The BCS and CMRI software supplier should ensure backward compatibility with Windows Operating Systems launched in the last 5 years. The latest versions should support all existing versions of the meters of the same type which are available in the field and are covered under the Guarantee period.

11.3. PROGRAMMABLE PARAMETERS

As mentioned at Cl.10 of this specification.

11.4. PASSWORD AUTHENTICATION

Configuration change activity (programming) should be enabled at BCS under multilevel password protected security system for selected meter(s) identified by the meter serial number(s). Configuration change activity shall not be possible, without entering the password/ security keys. Such configuration change in the meter shall be immediately preceded automatically by meter-data reading such that entire meter data prior to change is downloaded from the meter before the change is effected in the meter.

11.5. TRANSACTION HISTORY

Details of minimum 10 programming events (changes made in the meter) shall be logged in the meter memory, each with date and time stamp and details of the changes made. It shall be possible to download this data through HHU and shall be available for viewing at the BCS end.

11.6. EVENTS LOG

Tamper Events (occurrence and restoration) shall be logged in meter memory along with date & time of occurrence and restoration, and be available for downloading through a CMRI/Stand- alone PC/Laptop for viewing at the BCS end. These events shall be logged on roll-over, first-in & first-out basis.

11.7. ROLL OVER AND NON-ROLL OVER EVENTS

(i) Following data should be recorded in the meter as roll-over data to be cleared on FIFO basis:

(a) Billing Reset backups
(b) Load survey days
(c) Tamper events
(d) Power failure records
(e) Energy values (once the reading exceeds the total number of digits provided for displaying the energy)
(f) Transaction history

(ii) In addition meter should record "Cover Open" Tamper occurrence as a non-roll over event. The first event should not be lost in any case as the meter's performance can't be guaranteed after the meter cover has been opened.

(iii) Rising Demand reading will get reset at the end of every integration period.

(iv) Maximum Demand reading will get replaced by the higher demand data as and when the higher demand occurs.

It should not be possible to erase any data inside the meters manually or by the use of any software. Manufacturer must have software for initialization of the meter ensuring proper authority and security, in which case, all data stored in the meter should get cleared, so that it is very evident that such initialization has taken place. In any case partial initialization of data/events records shall not be possible.

11.8. DATA TRANSFER - SECURITY AND AUTHENTICITY

(i) It shall be possible to transfer the data between Meter and HHU through serial Interface/port or other communication channels and then on to the Base Computer Software. In both these transactions, it shall be possible to confirm that the data, received during the communication is not corrupted either during communication or with the intention of tampering while it is stored in the CMRI. For this purpose, a checksum shall be provided by the manufacturer, which should be checked by the BCS on dumping of data to BCS.

(ii) Similarly in the case of AMR, checksum should be verified at MDAS end to ensure that the data received is authentic data and has not got corrupted.

11.9. DATA CONVERSION

The manufacturer shall provide the software by which utility will be able to convert all the downloaded meter data in some standard formats.

12.0 TESTS AND TEST CONDITIONS

12.1 General Testing Procedures

12.1.1 Test Conditions

All tests are carried out under reference conditions unless otherwise stated in the relevant clause. During type tests, routine tests and acceptance tests, accuracy of meter being tested shall remain within the class of accuracy under reference condition. If % error of meter during test(s), is drifted beyond class of accuracy, when measured under reference condition, such meters shall be deemed to be not-compliant to this specification.

12.1.2 Type Tests

The following type test should have been conducted on one or more specimens of the meter to establish its specific characteristics and to prove its conformity with the requirements of this specification.

SL No.	Tests	Standard
12.1.2.1	Tests of insulation properties	Cl. 12.7.6.2 of IS 14697:1999/Cl.5.4.6 of CBIP Publication No.325
12.1.2.1.1	Impulse Voltage Test	Cl. 12.7.6.2 of IS 14697:1999/Cl.No.5.4.6.2 of CBIP Publication No.325
12.1.2.1.2	AC Voltage test	Cl.No.12.7.6.3 of IS 14697:1999/5.4.6.3 of CBIP Publication No.325
12.1.2.1.3	Insulation Resistance Test	Cl.No.12.7.6.4 of IS 14697:1999/5.4.6.4 of CBIP Publication No.325
12.1.2.2	Tests of accuracy requirements	Cl.12.9 of IS 14697:1999/Cl.5.6 of CBIP Publication No.325
12.1.2.2.1	Test on limits of error	Cl.12.15 of IS 14697:1999/Table No.13 of Amendment No.1 October 2003 to IS 14697:1999/Cl.4.6.3 & Table No.17 of CBIP Publication No.325

12.1.2.2.2	Test of meter constant	Cl.No.12.14 of IS: 14697/ Table No. 11 of Amendment No.1 October 2003 to IS 14697:1999/ Cl. 5.6.6. & Table No.15 of CBIP Publication No.325.
12.1.2.2.3	Test of starting condition	Cl.12.13 & Table 15 of IS 14697:1999/Cl.5.6.5 of CBIP Publication No.325
12.1.2.2.4	Test of no-load condition	Cl.No.12.12 of IS 14697:1999/Cl.5.6.4 of CBIP Publication No.325
12.1.2.2.5	Repeatability of error test	Cl.No.11.7,Cl.12.16 of IS 14697:1999/Cl.4.6.1,Cl.5.6.9 of CBIP Publication No.325

SL No.	Tests	Standard
12.1.2.2.6	Test of ambient temperature influence	Cl.No.12.11,Cl.11.3,Table No.14 of IS 14697:1999/ Cl.5.6.3,Cl.4.6.4, Table No.18 of CBIP Publication No.325
12.1.2.2.7	Test of influence quantities	Cl.12.10 of IS 14697:1999/Cl. 5.6.2 of CBIP Publication No.325
12.1.2.3	Test of electrical requirements	Cl.12.7 of IS 14697:1999/Cl.5.4 of CBIP Publication No.325
12.1.2.3.1	Test of power consumption	Cl.12.7.1 of IS 14697:1999/Cl.5.4.1 of CBIP Publication No.325
12.1.2.3.2	Test of influence of supply voltage	Cl.12.7.2 of IS 14697:1999/Cl.5.4.2 of CBIP Publication No.325
12.1.2.3.3	Test of influence of short time over-currents	Cl.12.7.3 of IS 14697:1999/Cl.5.4.3 of CBIP Publication No.325
12.1.2.3.4	Test of influence of self-heating	Cl.12.7.4 of IS 14697:1999/Cl.5.4.4 of CBIP Publication No.325
12.1.2.3.5	Test of influence of heating.	Cl.12.7.5 of IS 14697:1999/Cl.5.4.5 of CBIP Publication No.325
12.1.2.3.6	Test of abnormal voltage condition	Cl.4.4.7 of CBIP Publication No.325
12.1.2.4	Tests for electromagnetic compatibility (EMC)	Cl.5.5 of CBIP Publication No.325
12.1.2.4.1	Test of immunity to electrostatic discharge	IS:14700(Part IV/Sec II):2008/Cl.5.5.2 of CBIP Publication No.325
12.1.2.4.2	Fast transient burst test	IS:14700 (Part IV/Sec IV):2008/ Cl.5.5.3 of CBIP PublicationNo.325
12.1.2.4.3	Test of immunity to electromagnetic fields	IS:14700(Part IV/Sec III):2008/ Cl.5.5.4 of CBIP Publication No.325
12.1.2.4.4	Radio interference suppression	IS:6873(Part VII):2012/Cl.5.5.5 of CBIP Publication No.325
12.1.2.5	Tests of climatic influences	Cl.5.3 of CBIP Publication No.325
12.1.2.5.1	Dry heat test	IS:9000(Part III/Sec I & III)/ Cl.5.3.1 of CBIP Publication No.325
12.1.2.5.2	Cold test	IS:9000(Part II/Sec I to IV)/ Cl.5.3.2 of CBIP Publication No.325
12.1.2.5.3	Damp heat, cyclic test	IS:9000(Part V/Sec I & II)/ Cl.5.3.3 of CBIP Publication No.325
12.1.2.6	Tests of mechanical requirements	Cl.5.2 of CBIP Publication No.325
12.1.2.6.1	Vibration test	IS:9000(Part VIII)/ Cl.5.2.3 of CBIP Publication No.325

12.1.2.6.2	Shock test	Section1 of IS:9000(Part VII/Sec I)/ Cl.5.2.2 of CBIP Publication No.325
12.1.2.6.3	Spring hammer test	IEC:60068-2-75/ Cl.5.2.1 of CBIP Publication No.325
12.1.2.6.4	Tests of protection against penetration of dust and water	IS:12063/ Cl.5.2.5 of CBIP Publication No.325
12.1.2.6.5	Test of resistance to heat and fire	IS:11000(Part I& II)/ Cl.5.2.4 of CBIP Publication No.325

12.1.2.7 (i) The above Type Tests should have been conducted within last 5 (Five) years from the date of opening of Techno Commercial Offer against the above Tender in the following Laboratory (ies) only:

a) CPRI
b) ERTL
c) ETDC
d) NPL
e) ERDA
f) At any NABL accredited Testing Laboratory except the laboratory of the manufacturer.

(ii) In case of any of the above Type Test(s) have not been conducted by the Bidder on the meter(s) of the same type, having identical characteristics, same rated current, same reference voltage, quality, constructional features and design as well as same accuracy class or/and the Type Test Report(s) are more than 5(Five) years old or/and the test(s) have not been conducted in the above mentioned Laboratory(ies), the same shall be conducted by the successful Bidder(s) in the said Laboratory (ies) at their own cost, in the presence of representative(s) of OPTCL without any financial liability to OPTCL, in the event of order.

(iii) Reports for type tests conducted in manufacturer's own laboratory and certified by testing institute **shall not be acceptable**.

(iv) The purchaser reserves the right to demand repetition of some or all the type tests in the presence of purchaser's representative on free of cost to OPTCL.

12.1.3 Routine Tests

The following Routine Tests shall be carried out by the successful Bidder on each of the ordered quantity of meters to check the conformity with the requirement as per this Specification and the said Routine Test Certificates shall be submitted to OPTCL on or before offering the Meters for Inspection and witnessing the Acceptance Test by OPTCL's authorized representative(s).The Inspecting Officer(s) will be authorized subject to the condition that the Routine Tests will be found to be in order as per requirement of this Specification.

SL No.	Tests	Standard
12.1.3.1.	**Tests of insulation properties**	Cl. 12.7.6.2 of IS 14697:1999/Cl.5.4.6 of CBIP Publication No.325
12.1.3.1.1	AC Voltage test	Cl.No.12.7.6.3 of IS 14697:1999/5.4.6.3 of CBIP Publication No.325

12.1.3.1.2	Insulation Resistance Test	Cl.No.12.7.6.4 of IS 14697:1999/5.4.6.4 of CBIP Publication No.325
12.1.3.2	**Tests of accuracy requirements**	Cl.12.9 of IS 14697:1999/Cl.5.6 of CBIP Publication No.325
12.1.3.2.1	Test on limits of error	Cl.12.15 of IS 14697:1999/Table No.13 of Amendment No.1 October 2003 to IS 14697:1999/Cl.4.6.3 & Table No.17 of CBIP Publication No.325
12.1.3.2.2	Test of starting condition	Cl.12.13 & Table 15 of IS 14697:1999/Cl.5.6.5 of CBIP Publication No.325
12.1.3.2.3	Test of no-load condition	Cl.No.12.12 of IS 14697:1999/Cl.5.6.4 of CBIP Publication No.325

12.1.4 Acceptance Tests:

The following Acceptance Tests shall be conducted by the successful bidder on the sample Energy Meters, selected at random by OPTCL's representative(s)from the offered Lot of Meters as per 'Recommended Sampling Plan and Criteria for Acceptance' of **ANNEX-E of IS:14697** at the cost of the Bidder.

SL No.	Tests	Standard
12.1.4.1	**Tests of insulation properties**	Cl. 12.7.6.2 of IS 14697:1999/Cl.5.4.6 of CBIP Publication No.325
12.1.4.1.1	AC Voltage test	Cl.No.12.7.6.3 of IS 14697:1999/5.4.6.3 of CBIP Publication No.325
12.1.4.1.2	Insulation Resistance Test	Cl.No.12.7.6.4 of IS 14697:1999/5.4.6.4 of CBIP Publication No.325
12.1.4.2	**Tests of accuracy requirements**	Cl.12.9 of IS 14697:1999/Cl.5.6 of CBIP Publication No.325
12.1.4.2.1	Test on limits of error for active and reactive energy	Cl.12.15 of IS 14697:1999/Table No.13 of Amendment No.1 October 2003 to IS 14697:1999/Cl.4.6.3 & Table No.17 of CBIP Publication No.325
12.1.4.2.2	Test of meter constant	Cl.No.12.14 of IS: 14697/ Table No. 11 of Amendment No.1 October 2003 to IS 14697:1999/ Cl. 5.6.6. & Table No.15 of CBIP Publication No.325.
12.1.4.2.3	Test of starting condition	Cl.12.13 & Table 15 of IS 14697:1999/Cl.5.6.5 of CBIP Publication No.325
12.1.4.2.4	Test of no-load condition	Cl.No.12.12 of IS 14697:1999/Cl.5.6.4 of CBIP Publication No.325
12.1.4.2.5	Repeatability of error test	Cl.No.11.7,Cl.12.16 of IS 14697:1999/Cl.4.6.1,Cl.5.6.9 of CBIP Publication No.325
12.1.4.3	**Test of electrical**	Cl.12.7 of IS 14697:1999/Cl.5.4 of CBIP Publication

	requirements	No.325
12.1.4.3.1	Test of power consumption in voltage and current circuit	Cl.12.7.1 of IS 14697:1999/Cl.5.4.1 of CBIP Publication No.325
12.1.4.3.2	Test for Verification of Tamper Events Conditions	
12.1.4.3.3	Test for Verification of Display Parameters	
12.1.4.3.4	Physical Verification of Meter as per this specification and approved drawings.	
12.1.4.4	**Communication Protocol Test**	

N: B-Accuracy test shall be performed at the beginning and at the end of the acceptance tests.

The meter should pass all above **acceptance tests** during inspection, failing which the offered lot of meters by the firm will be rejected. If the facility for any of the tests as specified above is not available at manufacturer's works, the testing shall be arranged at any of the NABL approved lab. viz, ERDA,NPL,ETDC,ERTL,CPRI only and for such tests all the expenditures i.e. test charges etc. shall have to be borne by the supplier.

Meters claiming conformance to IS 15959 with its latest amendments shall be subjected to:

a) Conformance to IEC62056 (DLMS) to be verified using the latest version of the Conformance Test Tool (CTT) authorized by DLMS UA.
b) Parameters verification for conformance to the ICS requirements using appropriate third party test tool.

The parameters to be verified:

- Instantaneous Parameters
- Block Profile I Load Survey Parameters
- Daily Profile Parameters
- Parameters for accounting/billing
- General Purpose quantities
- Name Plate Details
- Programmable parameters
- Events
- Access mechanism

12.1.5 Acceptance Tests for PC Software and data down loading using meter communication ports-

All Meters after final assembly and before despatch from Bidder's/Manufacturer's works shall be duly tested to verify that they are suitable for downloading data using meter communication ports shall be subjected to the following acceptance test.

(i) Downloading Meter Data from the Meter(s) to PC via optical port.
(ii) Downloading meter data through USB port and RS 232.
(iii) Downloading meter data to DCU/CDCS through Ethernet as well as RS 485 port.
(iv) Compatibility with PC Software.
(v) Functioning of Time synchronisation, advance and retard time commands.
(vi) Per meter downloading time verification.

Copy of Test certificate shall be submitted to OPTCL.

GENERAL :

a) The meter shall be supplied with latest/compatible software (shall be compatible with old & new meters data download handling). Any new software as required to be installed within warranty period are to be done by party or through remote support to client. The total arrangement shall be such that one (1) operation (click on " data download from meter" button on software) can carry out the whole operation in about five (5) minutes per meter or preferably faster.

b) The layout of software front end/user interface has to be approved by OPTCL during technical evaluation/demonstration. However a standard template sheet will be provided along with bid for reference.

c) Software for windows/office/antivirus are to be supplied. Antivirus should not slow down the processes of data downloading from meter and same will be demonstrated during technical demonstration. .

d) Above specification is minimum only, any higher standard required for the purpose intended (meter data handling) would be assessed by vendor and would be supplied accordingly. The detailed architecture shall be approved during drawing approval stage.

e) Meter shall be accommodated in existing C&R panels of standard size (Alstom/ER/ABB/Siemens/etc) or kiosk with door closed. If required before bidding, bidder may collect necessary data or else the scope is deemed to be included.

f) Step by Step procedure (on screen shot type and desktop video capture) shall be provided for : i) Meter maintenance/site-testing procedure as per relevant IS/IEC standard.
ii) Procedure for data downloading from Meter by HHU/Laptop/Desktop PC.
iii) Installation/Re-installation of Database handling software in to Laptop/PC.

Note: Bidder should note that the Purchaser reserves the right to go for testing of Energy Meter(s) selected at random from the supplied quantity, in any of the Testing Laboratory (ies), as specified elsewhere in this Technical Specification.

13.0 QUALITY ASSURANCE:

13.1 The bidder shall submit the details of Quality Assurance Plan to be followed during testing of the components, manufacturing, and stage inspection and testing of the meters, transportation, delivery, storage, installation and commissioning including commissioning tests.Details of bidder's quality assurance and test setup shall also be furnished with the bid. The manufacturer should generally meet the following Quality Assurance Criteria and shall furnish following information along with the bid:

i. The factory shall be completely dust proof;
ii. The testing rooms shall be temperature and humidity controlled as per relevant Standards;

iii. The testing and calibrating equipments / instruments shall have their valid calibration certificates;

iv. Testing & calibration facility, date of calibration of test bench, manpower data of bench operators;

v. Power supplies used in testing equipment shall be distortion free with sinusoidal wave-forms and maintaining constant voltage, current and frequency as per the relevant Standards;

vi. Organisation Structure of the manufacturer & his main sub-supplier (PCB, SMT cards, CT/PT with details of QA set up, overall workflow);

vii. Copy of the system manual showing Quality Assurances Plan as actually practised during manufacturing and final testing;

viii. List of raw materials & critical components (ASIC chip, Crystal clock, memory register chip, Transformers, optical ports etc.) with their suppliers;

ix. Stage inspection of product before final testing;

x. Procedure adopted for 'in-site' testing of PCBs, after placement of surface mounted components for quantitative parameters variations of tolerance by self or sub-contractor.

At PCB manufacturing stage, each board shall be subjected to computerized bare board Testing;

xi. At insertion stage, all components should undergo computerized testing for conforming to design parameters and orientation;

xii. Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment;

xiii. Prior to final testing and calibration, the meters should be subjected to accelerated ageing test to eliminate infant mortality;

xiv. The calibrations of meters shall be done in-house.

13.2 The quality control procedure to be adopted during manufacturing of the specified equipment shall be mutually discussed and finalized in due course, generally based on the established and proven practices of the manufacturer. The software shall be user friendly which can be easily installed in any PC/Laptop irrespective of operating system of the PC/Laptop, and shall be certified for ensuring data handling capabilities. The same shall be demonstrated by the party during technical evaluation. During demonstration party shall bring standard meter. Thereafter software shall be offered for technical compatibility before taking up further necessary action in the procurement process.

Any other activity relating to Quality Assurance should be stated by the Bidder in their offer.

14.0 INSTALLATION & COMMISSIONING:

The energy meters specified above shall be installed at various EHV sub-stations, owned by the owner & other agencies throughout Odisha. The exact location & time table for installation shall be finalized by the owner in due course and advise to the supplier, such that supplier's responsibility in this respect remains. The supplier shall be responsible

for total installation & commissioning of the meters as per owner's advice, including unpacking & inspection on receipt at site, mounting, rewiring, functional testing, commissioning and handing over. The supplier's personnel shall procure /carry the necessary tools, material & consumables (including insulated wires, lugs, ferrules, hardware etc.) for the said purpose.

As a part of commissioning, the supplier shall load the software as specified into the PCs at the respective sub-stations & commission the total meter reading scheme. He shall also impart necessary training to the sub-station Engineers.

At the time of commissioning, each meter shall be tested by the supplier at site for accuracy. **Supplier shall bring standard reference meter of better accuracy class than the meter under test of electronic phantom load**.

The following Test Procedures/Stipulations for 'On Site Meter Testing' as per Appendix-G of CBIP Publication No.325, January 2015 shall be followed:-

Testing with Phantom Load:

For such testing, use of Reference Standard with "Total Uncertainty" level as specified in IS 15707 will be used, however accuracy class 0.05 or better for reference standard is recommended:

- **Remove MUT connection from the Terminal block (TTB) for testing.**
- **Connect Reference Standard with MUT & Phantom Load.**
- **Note down the instantaneous values of Voltage, Current and Power Factor, as displayed by the reference standard.**
- **It is recommended to start testing 2 minutes after load is ON. Check the stability of the error of the MUT by checking the initial errors at 20 pulses.**
- **Meter to be tested on various testing points: preferably 3 test points.**
- **The typical test duration should be 2 minute but should not be more than 5 minutes.**
- **Start the test and note down the test parameters &results in percentage errors.**
- **Re-install the meter after completion of testing and restore supply.**

Precautions

- Ensure the test equipments are duly calibrated and have uncertainty level within acceptance range.
- Only certified / trained personnel should conduct testing.
- Observe all safety precautions and take all precautions while re-installing the MUT or switching ON to the load.

Accuracy tests wherever applicable, shall be conducted for both the import and export mode.

15.0 PUSH BUTTON DISPLAY AND INSTANTANEOUS DISPLAY DATA PARAMETER:

1.Real Time Clock – Date and Time 2. Current - I_R 3. Current – I_Y 4. Current – I_B 5. Voltage – V_{RN} 6. Voltage – V_{YN} 7. Voltage – V_{BN} 8. Instantaneous values of KW in all 3 phase 9. Signed Power Factor –R phase 10. Signed Power Factor - Y phase 11. Signed Power Factor - B phase 12. Three Phase Power Factor – PF 13. Total Harmonic Distortion Current – I_{RTHD} 14. Total Harmonic Distortion Current - I_{YTHD} 15. Total Harmonic Distortion Current - I_{BTHD} 16. Total Harmonic Distortion Voltage- V_{RNTHD} 17. Total Harmonic Distortion Voltage –V_{YNTHD} 18. Total Harmonic Distortion Voltage -V_{BNTHD}	19.Total Harmonic Distortion Active Power -W_{RTHD} 20.Total Harmonic Distortion Active Power –W_{YTHD} 21.Total Harmonic Distortion Active Power - W_{BTHD} 22. Frequency 23. Apparent Power – KVA 24. Signed Active Power – kW (+ Forward;- Reverse) 25.Signed Reactive Power – kvar (+ Lag; -Lead) 26. Cumulative Energy kWh Import 27. Cumulative Energy kWh Export 28. Cumulative Energy kVAh Import 29. Cumulative Energy kVAh Export 30. Cumulative Tamper Count 31. Cumulative Billing Count 32. Billing Date (Most Recent) 33. Meter serial nos. 34. Cumulative Power OFF minutes 35. Cumulative Power ON minutes 36. Error Message, if any

ADDITIONAL PARAMETERS:

1. Cumulative Energy kVArh Lag while active import 2. Cumulative Energy kVArh Lead While active Import 3. Cumulative Energy kVArh Lag while Active Export 4. Cumulative Energy kVArh Lead While active Export 5. Cumulative Reactive Energy with (±) Sign for Voltage High Condition(i.e. when RMS Voltage >103% Vn) 6. Cumulative Reactive Energy with (±) Sign for Voltage Low Condition(i.e. when RMS Voltage>103% Vn) 7. Rising Demand with Elapse Time 8. Maximum Demand Active –Import (0-24 Hrs) 9. Maximum Demand Active – Export (0-24 Hrs) 10. Maximum Demand Apparent While Active Import (0-24 Hrs) 11. Maximum Demand Apparent While Active Export (0-24 Hrs) 12. Last IP Demand for Active Import 13. Last IP Demand for Active Export 14. Last 05 Block Average Frequency	15. Cumulative Maximum Demand –Import 16. Cumulative Maximum Demand –Export 17. R-Phase Instant –Active Current 18. Y-Phase Instant –Active Current 19. B-Phase Instant –Active Current 20. R-Phase Instant –Reactive Current 21. Y-Phase Instant –Reactive Current 22. B-Phase Instant –Reactive Current 23. High Resolution Active Import 24. High Resolution Active Export 25. High Resolution Reactive Import(Q1+Q2) 26. High Resolution Reactive Export(Q3+Q4) 27. High Resolution Apparent Import 28. High Resolution Apparent Export 29. Net Active Energy (I-E) 30. Net Reactive Energy 31. Net Reactive High (I-E) 32. Net Reactive Low (I-E)

AUTO DISPLAY

i. Current - I_R **ii.** Current – I_Y **iii.** Current – I_B **iv.** Voltage – V_{RN}	**xvi.** Cumulative Energy kWh import **xvii.** Cumulative Energy kWh Export **xviii.** Cumulative Energy kVAh import **xix.** Cumulative Energy kVAh Export

v. Voltage – V_{YN} **vi.** Voltage – V_{BN} **vii.** Signed Power Factor –R phase **viii.** Signed Power Factor - Y phase **ix.** Signed Power Factor - B phase **x.** Three Phase Power Factor – PF **xi.** Signed Average Power Factor **xii.** Frequency **xiii.** Apparent Power – kVA **xiv.** Signed Active Power – kW (+ Forward;- Reverse) **xv.** Signed Reactive Power – kVAr (+ Lag; - Lead)	**xx.** Cumulative Energy kVARh Lag while active import **xxi.** Cumulative Energy kVARh Lead While active Import **xxii.** Cumulative Energy kVARh Lag while Active Export **xxiii.** Cumulative Energy kVARh Lead While active Export **xxiv.** Maximum Demand Active –Import (0-24 Hrs) **xxv.** Maximum Demand Active – Export (0-24 Hrs

*** Other parameters (Abstract Parameters) shall be in line with DLMS table, Name plate details, Programmable Parameters, Events (Voltage, Current, Power, Transaction, Control & others related)

16.0 PACKING AND FORWARDING:

The meters shall be packed in cartoons / crates suitable for vertical/horizontal transport as the case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Proper arrangement for lifting, such as lifting hooks or handles etc., shall be provided. Any material found short or broken inside the packing cases shall be replaced immediately by supplier without any extra cost.

The packing shall be done as per the manufacturer's standard practice. However, packing shall be safe and water-proof and manufacturer should ensure the packing such that, the material shall not get damaged during transit by Rail/Road.

17.0 DOCUMENTATION:

1. The bidder shall furnish followings along with bid:

- One set of drawings, clearly indicating the general arrangements, fitting details, electrical connections etc.;
- Technical leaflets (user manual) giving operating instructions;
- One copy of dimensional drawing of the box for each quoted category of the meter;
- A list of all components used in the meter;
- All information and documents as asked at in clause-13 (QAP) above;

2. One set of operating manual shall be supplied to each consignee for every 6 Nos. of meters;
3. The routine test certificates of the meters shall accompany each dispatch consignment.

18.0 The successful Bidder, within 15(fifteen) days from the date of purchase order, shall submit the relevant drawings, Technical details, Quality Assurance Plan and depute their

concerned Engineer(s) to the office of the purchaser for finalization of the drawings, Technical Requirements, Quality Assurance Plan etc. so as to go for manufacturing of the meters.

19.0 SUPPORT SERVICES:

In addition to the supply of meters, the supplier would be required to extend Technical Support and services, as and when required on any ambiguity in regard to automated meter reading/ , data analysis and energy audit, pertaining to;

i. Load profiles/Load Survey;
ii. Tamper data and any other such useful information;
iii. The computer software (Windows based preferably) should have suitable interface to transfer the billing Data to billing software on line through LAN or through pen drive etc. for processing/printing out the energy bills. The computer software should be able to convert the data received from the meter into database so that further processing of the output is possible;
iv. The successful bidder shall be required to impart free of charge practical training to purchaser's staff at the place of installation so as to equip them for use of the meters, HHU, all software including data off loading, report generation and all precautions/measures to be taken to avoid any loss of energy as per this specification to GRIDCO & OPTCL. Also the successful bidder shall be required to co-operate with the AMI (Advanced Metering Infrastructure) vender of OPTCL in all related matters (technical support & service) pertaining to successful implementation of the project without any additional financial liabilities to OPTCL.
v. The bidder shall also submit complete technical write up on construction manufacturing, functioning, event logging & maintenance of meters along with literature of trivector meters.

20.0 CERTIFICATES:

Following Certificates shall be furnished by the bidders in their offer that:

i. Their offered meters are capable of recording minimum of 200 tamper events;
ii. Their offered meters are capable of storing minimum 45 days load survey and all other required data;
iii. RTC Drift shall be within (+/-) 2 minutes per year;
iv. Software takes care of 29th Feb of the leap year;
v. Meter will not be affected by Abnormal Voltage, Frequency, Current, Voltage dip and all other abnormal/influencing conditions as per this specification.

21.0 GUARANTEED TECHNICAL PARTICULARS (GTP)

The bidder shall furnish all the necessary information and data, as required in the schedule of Guaranteed Technical Particulars as per ANNEX-I. If the bidder desires to furnish any other information (s) in addition to the details as asked for, the same may be furnished in a separate ANNEXURE along with the Bid offer.

ANNEXURE-I

GUARANTEED TECHNICAL PARTICULARS FOR 0.2S ACCURACY CLASS A.C STATIC ABT COMPLIANT TRIVECTOR ENERGY METER

Sl.No	Description		Requirement as per Specification	To be filled in by the Bidder
1	Name of the Manufacturer & Origin.			
2	Type of Installation		Indoor	
3	Type of meter/model		3phase,4wire , Model B	
4	Accuracy class:	Active :	0.2S	
		Reactive:	0.2S	
5	Meter case		Polycarbonate	
6	Battery life for clock		Minimum 10 years	
7	Meter's Parameters			
	a) Instantaneous			
	b) Load profile			
	c) Billing parameters			
8	P.F. Range		0 Lag-unity- 0 Lead	
9	Maximum Current of the Meter(I_{max})		$1.2I_n$	
10	Starting Current (% of Rated Current)		0.1(MAX.)	
11	Short-time over-current capability of the meter with tolerance & duration		20 I_{max} (Tol.0% to -10%),0.5 Second	
12	CT secondary rated current (I_n)		1 Amp	
13	VT Secondary rated		Ph-N : 110/√3 V	
	(reference) voltage(V_r)		Phase to Phase 110 V.	
14	Limit Voltage Range of Operation		0.7 to $1.2V_{ref}$	
15	Specified Operating Voltage Range		0.8 to $1.1V_{ref}$	
16	Dynamic Voltage withstand capability		190Volt ,3 sec	
17	AC Test Voltage(kV_{rms})		As per Table-3 of 62053-22@IEC:2003	
18	Impulse Test Voltage (kV_{peak})		10	
19	Earthing System		Solidly Grounded	
20	Reference Frequency and range		50Hz+/- 5%	
21	Temperature Range(As per IS)			
	(i) Specified Operating Range		-10^0C to 55^0C	
	(ii) Limit Range of Operation		-25^0C to 60^0C	
	(iii) Limit Range for Storage & Transport		-10^0C to 70^0C	
22	Power Consumption at reference temperature & reference frequency			
	(i) Voltage Circuits		1.5W & 10VA/Phase (MAX.)	
	(ii) Current Circuits		1.0 VA/Phase (MAX.)	
23	Measuring Range of the Meter		0.01 I_n to 1.2 I_n	
24	Type of Memory		Non-Volatile	
	Non-volatile memory storage capacity		45 days	
25	Data retention by NVM without battery backup and unpowered condition		Life time of the meter	
26	Communication Capability		Both by HHU & Remotely	

27	Communication Protocol Requirements	As per DLMS & IS:15959 (ICS) with its latest amendments	
28	MD reset Provisions	a) Manually b) Through authenticated CMRI/Laptop or remote communication command c) Automatic resetting at present date & time	
29	No. of digits of display and height of character	Liquid Crystal Display (LCD) with backlit	
		Character height and number of characters to mentioned	
30	Principle of operation	To be filled by the Bidder	
31	Demand Integration Period(DIP)	05 & 15 Minutes (**Programmable**)	
32	Weight of meter	To be filled by the Bidder	
33	Dimensions	To be filled by the Bidder	
34	Guarantee	5 years(min)	
35	Outline drawings & Leaflets	Details of enclosed documents	
36	Remote meter-readout facility	RS232/RS485	
	Communication protocol	DLMS & ICS,15959 with its latest amendments	
	Sealing provision	As per this specification	
	Baud rate of data Transfer from meter to CMRI/RMR	Preferable 9600	
	Manufacturer's Seal & Type of Seal	Shall be provided as per CEA metering regulation,2006	
37	Base Computer Software works on which operating system	Windows with backward compatibility for last 5 Years	
38	Provision of TOD Metering	Yes(programmable)	
39	Whether meter measures both fundamental & Harmonic Energy	i)For Billing :-Energy recording(Fundamental only, filtering out harmonics) ii)For Analysis:- Total energy (Fundamental +Harmonics)	
40	Real Time Clock Accuracy	+/- 2min per annum.	
42	Self-Diagnostic Feature	Yes	
43	Provision of Anti-Tamper Features	Yes	
44	Details of tamper and fraud Provisions		
	i)Missing potential	Meter to detect & record	
	(ii)Current Polarity Reversal	Meter to detect & record	
	(iii)Current Circuit Bypass	Meter to detect & record	
	(iv)Current Circuit Open	Meter to detect & record	
	(v)Invalid Voltage	Meter to detect & record	

	(vi) Current Imbalance	Meter to detect & record	
	(vii)Voltage Imbalance	Meter to detect & record	
	(viii) Meter "POWER" Off	Meter to detect & record	
	(ix) Meter Cover Open	Meter to detect & record	
45	(1) Meter shall have provision to read in the absence of power (2) Meter shall work accurately irrespective of phase sequence of the main supply. (3) Meter shall remain powered up and functional in presence of two wires (4) Meter shall record accurately even if neutral is disconnected in both balanced & unbalanced condition as per prevailing electrical conditions. (5) Measurement by meter shall not get influenced by injection of AC voltage/chopped signal/DC signal & harmonics. If metering gets affected, it will log Neutral Disturbance event along with date & time. (6) Meter shall register accurate energy even if load is drawn partially or fully through local earth.	Internal Battery to be provided Yes Yes Yes Yes Yes Yes	
46	Programmable Parameters	As per this specification	
47	Data retention by NVM without battery backup and unpowered condition	Life time of the meter	
48	Sampling Plan for Acceptance Test	As per ANNEX-E of IS:14697:1999	
49	Snap Shot Facility	Voltage, current, power factor, KWH with date & time of occurrence & restoration of tamper event	
50	No of tamper events	Minimum 200	
51	All soft wares, as stipulated in this specification	To be provided	

ANNEXURE-II

WHETHER THE TYPE TESTS REPORTS FOR FOLLOWING TESTS CONDUCTED IN PRESCRIBED LABORATORIES AS PER THIS SPECIFICATION HAVE BEEN FURNISHED WITH THE BID OFFER

SL No.	NAME OF THE TYPE TEST	WHETHER FURNISHED WITH THE BID OFFER	NAME OF THE LABORATORY WHERE THE SAID TEST CONDUCTED	THE DATE OF TESTING
1.	Impulse Voltage Test			
2.	AC Voltage test			
3.	Insulation Resistance Test			
4.	Test on limits of error			
5.	Test of meter constant			
6.	Test of starting condition			
7.	Test of no-load condition			
8.	Repeatability of error test			
9.	Test of ambient temperature influence			
10.	Test of influence quantities			
11.	Test of power consumption			
12.	Test of influence of supply voltage			
13.	Test of influence of short time over-currents			
14.	Test of influence of self-heating			
15.	Test of influence of heating.			
16.	Test of abnormal voltage condition			
17.	Test of immunity to electrostatic discharge			
18.	Fast transient burst test			
19.	Test of immunity to electromagnetic fields			
20.	Radio interference suppression			
21.	Dry heat test			
22.	Cold test			
23.	Damp heat, cyclic test			
24.	Vibration test			
25.	Shock test			
26.	Spring hammer test			
27.	Tests of protection against penetration of dust and water			
28.	Test of resistance to heat and fire			

ANNEXURE-III

ADDITIONAL TECHNICAL PARTICULARS TO BE QUOTED BY THE BIDDER:

SL. No.	Name of the Tamper Event	Voltage Threshold Value	Current Threshold Value	Persistence Time	Restoration Time
1.	Missing Potential				
2.	Invalid Voltage				
3.	Voltage Imbalance				
4.	Current Reversal				
5.	Current Circuit open				
6.	Current circuit Bypass				
7.	Current Imbalance				
8.	METER "POWER OFF"				

(B) TECHNICAL SPECIFIATION OF METERING PANELS SUITABLE FOR ACCOMMODATING 08NOS OF 0.2S CLASS TRIVECTOR ENERGY METERS IN EACH PANEL

1. Scope

The specification covers the design, engineering, manufacturing, assembly, inspection and testing before supply and delivery at sites/ stores/ FOR destination to accommodate maximum eight (8) nos. 0.2 class . A.C Static ABT & DLMS Compliant Trivector Energy Meters modules fitted in the space of 19" standard rack in each panel for use in metering system of OPTCL.

2. Applicable Standard

The meter panel shall confirm to the following Indian / international standards and all related Indian / international standards to be read with up to date and latest amendments/revisions thereof:

Sl No.	Standard No.	Title
1	IEC60297	Dimension of mechanical structure of 482.6mm(19") Series – Panels and Racks
2	IS-9000 with latest amendment	Basic environment testing procedures for electronics and electrical items.

3. Construction

I. Metering panel shall be suitable for indoor installation of vertical construction, free standing type and will have access to the inside from the rear. Panel should have provision to mount Half 19" Rack mounted 8 nos of energy meters. Metering cubical should be of dimension 1800 + 100mm (H) x 750mm (W) x 750mm (D).

II. The panel shall be fabricated from steel sheet not less than 1.6mm (16 SWG) thick. Gland plate and Base frame will be made of 3.0 ± 0.2 mm CRCA sheet. Main frame structure, all load bearing members and frame shall have built up thickness more than 2.0mm with standard profile. All clamps & sealing studs shall be of BS-304. All hardwares & plated items should pass the 96 hours salt spray test as per test procedure IS 9644-1961 without any corrosion.

III. One Hinged door shall be provided at the rear for access to inside of the panel. Two nos hinged door shall be provided on front side of panel, upper one would have glass window to view the meters without opening the door of panel and lower door shall be opaque to access the test terminal block. Each door shall be provided with a handle lock, flexible copper earth bond and and sealing arrangement.

IV. All doors shall have PU foam gasket all round, Gland plate of XLPE 10 x 3 mm gasket, material selection and workmanship shall be such as to result in neat appearance both

inside and outside, with no weld, rivets or bolt heads apparent from outside and with all exterior surfaces true and smooth.

V. No equipment will be mounted less than 300mm above the floor.

VI. All metal surfaces would be painted with powder coating of 60-80 micron with structure finish, the colour of panel will be grey as per IS5-631, Base frame- Black.

VII. Lifting hook (Eye Bolts) should be provided.

Panel Lighting

4. Proper arrangement should be made for panel lighting (230V AC) with LED lamp of 12W or more. A door-operated switch shall be provided with the rear door. A three pin, single phase, 230V AC service receptacle shall be provided in each panel**.** Panel should have provision for suitable space heater with thermostat of reputed make.

Grounding:

5. A ground bus of galvanized iron bar not less than 50 x 6 mm should be provided along the back of panels, maximum length of the bar will be 200mm. The ground buses shall be bolted to the frame of the panel in such a way so as to make good electrical contact with the panel. Hinged doors and all equipment on the metering cubicle shall be connected to the frame with minimum 2.5 Sq.mm copper strip / copper wire**.** All metallic parts will be earthed from panel body, suitable tag shall be provided with terminals & equipment. Panel body should have provision for earthing at two different places.

Test terminal blocks:

6. Each metering panel shall have 8 nos screw type test terminal blocks one for each meter's CT & PT connection. The test block shall be back connected type with removable cover, sealing provision will be available at front side for sealing suitable for 3 phase, 4 wire type connections.

Terminal blocks and terminals:

7. Terminal blocks shall be of adequate current rating requirements, all terminals should be suitable to mount 4.0 Sq. mm control wire (FRLS copper flexible PVC). Terminal blocks of (Disconnected type) of Make: Elemex/ Connectwell/ Reputed shall be arranged with sufficient space for connection of each incoming wire. Each feeder CT/ PT terminals are to be arranged together for easy identification. Blocks will be mounted in vertical columns along the sides of cubicles or on vertical panel specially provided for terminal block.

Component Wiring:

8. All internal wiring shall be made with annealed copper wire. Wires for current transformer and voltage transformer circuits shall not be smaller than 4.0Sq mm with proper phase identification and all other size shall be of 2.5 Sq mm multi strand copper

flexible FRLS PVC wire. Wiring between terminals of various devices shall be point to point & rout through suitable size cable tray. All internal wiring will be neatly truncated in wiring troughs, bound and anchored. Sufficient stack shall be left at component terminals to permit rearrangement of connection between the terminals of any particular component. Wiring will terminate not lower than 200mm above the floor of the panel. All wires will be identified at both ends using ferrules. Colour of wires shall have phase identification as red/ yellow/ blue and black for Neutral of CT & PT wiring and red/ black for auxiliary DC/ AC wirings. CT & PT wires should be provided with round lugs and all lugs shall be insulated/ sleeved to prevent short between the lugs at meter and terminal block end.

Indication Lamps:

9. (R / Y/ B) indication of LED type for phase healthiness for PT circuit of all feeders and panel indication for AC & DC supply with suitable fuse control will be provided at front side of panel.

10. Suitable gland plate of dimension 600 x 600 mm with CG plate fixing bolt along with knockout type holes of Ø 25 mm (8nos) & Ø 20mm (16nos) should be provided at bottom for CT/PT/AC DC aux circuit.

11. Panel shall be installed within the control room adjoining the existing panels as per suitable available place.

12. Drawing of metering panels shall also be attached having proper wiring diagram for evaluation and approval purpose. However manufacturers standard may be accepted, if it fulfils the requirement of the purchaser for which approval of drawings shall have to be obtained before commencement of the manufacturing.'

13. IP Protection Class of Panel: IP 54

14. The cut outs in the panel for installation of energy meters shall be suitably provided covered with blank plate with proper fixing arrangement for aesthetic look.

ANNEXURE-IV

SCHEDULE OF QUANTITY

Serial No	Description of Materials	Unit	Phase	Quantity	Delivery Schedule
1	0.2S ACCURACY CLASS AC STATIC ABT (DLMS) COMPLIANT (CATEGORY-B) TRIVECTOR ENERGY METERS, SUITABLE FOR ENERGY ACCOUNTING & AUDIT AND ALSO INTERFACE METER **(SUPPLY)**	Nos	I	157	Within Four (4) months from the date of issue of Purchase order
2	0.2S ACCURACY CLASS AC STATIC ABT (DLMS) COMPLIANT (CATEGORY-B) TRIVECTOR ENERGY METERS, SUITABLE FOR ENERGY ACCOUNTING & AUDIT AND ALSO INTERFACE METER **(ERECTION, TESTING & COMMISSIONING)**	Nos	I	157	Within Ten (10) months from the date of issue of Purchase order
3	METERING PANEL SUITABLE FOR HOUSING MAXIMUM EIGHT NUMBERS OF 0.2S ACCURACY CLASS AC STATIC ABT COMPLIANT TRIVECTOR ENERGY METERS SUITABLE FOR ENERGY ACCOUNTING & AUDIT AND ALSO INTERFACE METER IN EACH PANEL **(SUPPLY)**	Nos	I	60	Within Four (4) months from the date of issue of Purchase order

SECTION – V

COMPREHENSIVE AMC of 0.2S ACCURACY CLASS ENERGY METERS

Table of contents

SECTION – V

COMPREHENSIVE AMC FOR 0.2S Accuracy Class Energy Meters (DLMS & ICS compliant category "B")

SCOPE OF AMC(Comprehensive) FOR above category Meters:

(I)Annual Maintenance Contract (Comprehensive) for the meters to be provided in different Grid sub-stations for a period of **07(seven) years** beyond the Guarantee period (60 months from the date of commissioning) and shall have following scope**:-**

a) Preventive Maintenance [Half yearly(every six months)]: Contractor to Check Properly to ascertain the performance to the satisfaction of OPTCL in every six months of ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters. These inspections are to be carried out in presence of OPTCL Engineer(s) and contractor's representative(s). A report on inspection & testing along with the status of the ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters to be jointly signed for reference and record. In case any defect(s) is/are noticed during Preventive Maintenance, such defects are to be rectified within 15 days. The materials/equipments required to rectify the defects are to be supplied by the Bidder free of cost to OPTCL. In case contractor fails to perform the Preventive maintenance within the scheduled stipulated time, the purchaser shall recover from the supplier/contractor a Price Reduction Schedule for the delay as per the Price Reduction Schedule clause indicated below **(III-B).**

b) Break down maintenance: In case any defect is noticed, the Contractor shall be intimated by the owner, and Contractor shall attend the spot within 07 days from the date of intimation (Date of issue of Letter) positively and shall ascertain the defects and shall rectify the same within 15 days from the date of intimation (Date of issue of Letter) to the Contractor. In case Contractor fails to rectify the defects within the scheduled time, the purchaser shall recover from the supplier/ Contractor a Price Reduction Schedule for the delay as per the Price Reduction Schedule clause indicated below **(III-A).** The date of intimation to the Contractor regarding the troubles/defects of the ABT Compliant 0.2S Acc Energy Accounting and also Interface meters shall be reckoned as the base date for computing the Penalty amount.

c) Time Synchronisation of meters once in a year.

Relevant Stipulations on 'Site Meter Testing' shall be followed as per this specification and is mentioned as follows:

Testing with Phantom Load:

For such testing, use of Reference Standard with "Total Uncertainty" level as specified in IS 15707 will be used, however accuracy class 0.05 or better for reference standard is recommended:

- Remove MUT connection from the Terminal block (TTB) for testing.
- Connect Reference Standard with MUT & Phantom Load.
- Note down the instantaneous values of Voltage, Current & Power Factor, as displayed by the reference standard.
- It is recommended to start testing 2 minutes after load is ON. Check the stability of the error of the MUT by checking the initial errors at 20 pulses.
- Meter to be tested on various testing points: preferably 3 test points.
- The typical test duration should be 2 minute but should not be more than 5 minutes.

- Start the test and note down the test parameters &results in percentage errors.
- Re-install the meter after completion of testing and restore supply.

Precautions

- Ensure the test equipments are duly calibrated and have uncertainty level within acceptance range.
- Only certified / trained personnel should conduct testing.
- Observe all safety precautions and take all precautions while reinstalling the MUT or switching ON to the load.

Accuracy tests wherever applicable shall be conducted for both the import and export modes.

(II) TERMS OF PAYMENT: (For AMC Contract of ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters)

The terms of payments under this contract shall be governed as per the following:

1. Your unconditional acceptance of this order.

2. A performance Bank Guarantee as per the proforma enclosed for 3% of the total Maintenance Contract price (**for 07 years**) , which will remain valid for more than two months from the expiry of the contract period i.e. 86 months from the last date of the guarantee period. Initially, the BG shall remain valid for 18 months and the same to be revalidated from time to time to cover the entire AMC period plus two months.

3. Payment will be made equally at the end of every six months, period starting from the date of contract agreement as per the details below:

(a) Release of payment for the 1st installment: - The payment of 1st installments of each year are to be paid to you at the end of 6(six) months. All the ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters need to be Checked Properly under Preventive Maintenance (PM) to ascertain the performance to the satisfaction of OPTCL in every six months. This inspection is to be carried out in presence of OPTCL Engineer & contractor's representative. A report on inspection & testing along with the status of ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters should be jointly signed and furnished to the verifying authority (Concerned AGM/DGM of O&M Division) for verification and onward transmission to the designated Nodal Officer. You have to furnish the draft format for the inspection /testing & Status report of the Bus-Bar scheme, which shall be approved by the C.G.M (O&M), OPTCL, Bhubaneswar.

(b) Similarly, the payment of 2nd installments of each year are to be paid to you at the end of 12(Twelve) months, during which the inspection of ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters to keep the schemes in a healthy and functional condition, shall be carried out by the Bidder, on production of documents as indicated above.

* The payment for other years of AMC shall be made as indicated above.

(III) PRICE REDUCTION SCHEDULE:

(A) In the event of failure on your part to comply with the provisions of the contract regarding attending to the **Breakdown** of the ABT Compliant 0.2S Acc Energy Accounting and also Interface Meters at various grid substations as indicated elsewhere, a price reduction schedule @0.5% of the Unit AMC price for each day of delay, or part thereof, for such delay, subject to no upper ceiling, will

be levied, without prejudice to any other remedies to which OPTCL may also be entitled, under the provisions of the contract/bid specifications.

(B) In the event of failure on your part to comply with the provisions of the contract regarding attending to the **Preventive maintenance** (PM) of the ABT Compliant 0.2s Acc Energy Accounting and also Interface Meters at various grid substations as indicated elsewhere, a price reduction schedule @30% of the total AMC value for the period shall be imposed for that six monthly period.

(IV)PERFORMANCE SECURITY:

(a) You are requested to furnish a **Composite Performance Bank Guarantee** of 3% of the contract value in our standard bank guarantee format (as enclosed) towards security payment and performance from any Nationalised /Scheduled Bank having a place of business at Bhubaneswar on non-judicial stamp paper worth of Rs.29.00 (Rupees twenty nine) only or as applicable as per the prevailing laws. The said B.G. shall be accompanied with the confirmation letter from the issuing bank & should be capable of being encashed at Bhubaneswar, in order that the B.G.is accepted. The B.G. shall be furnished in favour of Senior General Manager (CPC), OPTCL Bhubaneswar-751022 within 30 days from the date of issue of AMC order and shall remain valid for two months more than the expiry of the contract period. Initially, the BG shall remain valid for 18 months and the same to be revalidated from time to time to cover the entire AMC period plus two months.
Where the contract is extended, the B.G. should also be suitably extended, to cover the entire contract period.
(b) No interest is payable on the Composite Performance Bank Guarantee.

(c) In case of non-fulfillment of contractual obligation in any manner, performance bank guarantee shall be invoked without intimation to you.

(V) GUARANTEE:

It will be contractor's responsibility to maintain the entire ABT Compliant 0.2s Acc Energy Accounting and also Interface Meters, as described in the scope of the contract in healthy and functional manner. The repair and replacement work will be completed within 15 days from the registration of the complaints by OPTCL Engineer(s) of the concerned Grid substations or AGM/DGM/GM of the concerned Division or Circles respectively, failing which the price reduction schedule clause as at **clause-III** shall be applied. The replacement of equipments will be done by using materials from the stock to be kept under contractor's scope. Any equipment removed from the ABT Compliant 0.2s Acc Energy Accounting and also Interface Meters location and taken for rectification will be rectified and returned back to OPTCL at contractor's own risk and expense, within 15 days from the date of such removal. The date of removal will be reckoned as the date of handing over & taking over report jointly signed by OPTCL Engineer of the concerned Grid substations and contractor's representative.

(a) An indemnity bond shall be furnished before receiving materials from OPTCL.

(b) In case the materials are not returned back to OPTCL within 15 days, a price reduction schedule shall be levied on the contractor as per clause **III-B**. In case the Bidder would not return the materials taken from the ABT Compliant 0.2s Acc Energy Accounting and also Interface Meters, the BG furnished towards the AMC shall be encashed without any intimation to you.

(VI) NODAL OFFICER:

A nodal officer shall be appointed by OPTCL, who will monitor the execution of entire maintenance activities within the scope of this contract. You will furnish all the records, reports, receipts etc., to the Nodal Officer, who will forward the documents, after due verification, for initiation of Half yearly payment activities. The name of the Nodal officer shall be intimated during placement of order to the successful contractor.

(VII) CONTRACT AGREEMENT:

Contractor shall prepare and finalise the Contract Document for signing of the formal Contract Agreement with us, as per the proforma to be provided to you, on non-judicial stamp paper of appropriate value within fifteen days from the date of this order. The contract papers shall be prepared in 2(two) originals and copies shall be 1(one) no for each sub-station, where the Bus- Bar protection is proposed.

(VIII) DURATION OF CONTRACT:

This AMC shall be in force for a period of 07(Seven) Years, beyond the Guarantee period of 60 months as stipulated in the Specification.

**** Important Instruction to Bidders**:

BIDDERS TO FOLLOW THE BELOW DURING FILLING OF BIDDING DOCUMENT:

1. Bidders to quote the rate separately for supply, installation, testing – commissioning & AMC of energy meters and Supply of metering panels separately as per the price format provided.

2. Bidders are requested to fill up the GTP's of all the Packages against each parameter positively.

3. **WORK OFF LOADED FROM FIRMS:** Firms from whom, OPTCL have off loaded works due to non-performance, during last **seven** years, shall not be eligible to participate in any of the OPTCL turnkey tenders.

4. The Bidder shall furnish the un-priced schedule (un-priced Bid) along with the techno-commercial bid (Part-I of the Bid). All the columns shall be filled by quoting "Quoted" only.

5. Evaluation will be done on the basis of total amount taken together for rates quoted against

(1) Supply, (2) Erection, testing & Commissioning (3) Comprehensive AMC (For 7 years) of Energy Meters, and (4) Supply of Metering Panels.

----- END OF TENDER SPECIFICATION-------