RFQ No.: 4100074214

OPEN TENDER NOTIFICATION

FOR

SITC OF FULLY AUTOMATIC SMART METER TEST BENCH FOR SINGLE PHASE & THREE PHASE SMART METERS & CONVENTIONAL METERS

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Tender Enquiry No.: 4100074214

Due Date for Bid Submission: 11.12.2026 [17:00 Hrs.]

The Tata Power Company Limited
Mumbai, Maharashtra

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RFQ No.: 4100074214

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1. Event Information

1.1 Scope of work

Open Tenders are invited in e-tender bidding process from interested Bidders for the following work as defined below:

S. No.	Description	EMD Amount (Rs.)	Tender Fee (Rs.)
1	SITC of Fully Automatic Smart Meter Test Bench for Single Phase & Three Phase Smart Meters & Conventional Meters	INR 2,25,000/-	2000

1.2 Availability of Tender Documents

Non-Transferable Tender documents may be downloaded by interested eligible bidders from TPC website www.tatapower.com with effect from 24.04.2026. The Tender Fee shall be submitted online through NEFT/ RTGS in favor of "The Tata Power Company Limited". Any such bid submitted without this Fee shall be rejected.

Bidders are requested to visit TPC website www.tatapower.com regularly for any modification/ clarification to the bid documents.

1.3 Calendar of Events

(a)	Date of availability of tender documents from TPC Website	From 20.11.2026 to 11.12.2026, 17:00 Hrs
(b)	Date & Time of Pre-Bid Meeting (If any)	24.11.2026, 12:00 Hrs Link to Join the meeting: **Join the meeting now**
(c)	Last Date of receipt of pre-bid queries, if any	24.11.2026, 17:00 Hrs
(d)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	26.11.2026, 17:00 Hrs
(e)	Last date and time of receipt of Bids	11.12.2026, 17:00 Hrs
(f)	Date & Time of opening of Price of qualified bids	Will be notified to the successful bidders through our website / e-mail.

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

1.4 Mandatory documents required along with the Bid.

1.4.1 EMD of requisite value and validity.
1.4.2 Tender Fee in case the tender is downloaded from website.

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1.4.3 Requisite Documents for compliance to Qualification Criteria mentioned in Clause 1.7.
1.4.4 Drawing, Type Test details along with a sample of each item as specified at Annexure I (as applicable)
1.4.5 Duly signed and stamped 'Schedule of Deviations' as per Annexure III on bidder's letter head.
1.4.6 Duly signed and stamped 'Schedule of Commercial Specifications' as per Annexure IV on bidder's letter head.
1.4.7 Proper authorization letter/ Power of Attorney to sign the tender on the behalf of bidder.
1.4.8 Copy of PAN, GST, PF and ESI Registration (In case any of these documents is not available with the bidder, same to be explicitly mentioned in the 'Schedule of Deviations')
1.4.9 Compliance to the technical requirement (Attached in Scope of Work)

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

1.5 Deviation from Tender

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

1.6 Right of Acceptance/Rejection

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

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

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

1.7 Qualification Criteria

Attached as Annexure to this document

1.8 Marketing Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the General Condition of Contracts. Bidders must agree to these rules prior to participating. In addition to other remedies available, TPC reserves the right to exclude a bidder from participating in future markets due to the bidder's violation of any of the rules or obligations contained in the General Condition of Contracts. A bidder who violates the marketplace rules or engages in behavior that disrupts the fair execution of the marketplace, may result in restriction of a bidder from further participation in the

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marketplace for a length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

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

1.9 Supplier Confidentiality

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

1.0 Evaluation Criteria

- The bids will be evaluated technically on the compliance to tender terms and conditions.
- The bids will be evaluated commercially on the overall all-inclusive lowest cost for the complete tender BOQ as calculated in Schedule of Items *[Annexure I].* TPC however, reserves right to split the order line item wise and/or quantity wise among more than one Bidder. Hence all bidders are advised to quote their most competitive rates against each line item.
- Bidder must mandatorily quote against each item of Schedule of Items *[Annexure I].* Failing to do so, TPC may reject the bids.

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

1.1 Price Variation Clause:

The prices shall remain firm during the entire contract period.

2.0 Submission of Bid Documents

3.1 Bid Submission

Bidders are requested to submit their offer in line with this Tender document. TPC shall respond to the clarification raised by various bidders and the replies will be sent to all participating bidders through e-mail.

Bids shall be submitted in 3 (Three) parts:

FIRST PART: "EMD" of Rs. 2,25,000/- (Rupees Two Lakh & Twenty-Five Thousand only) shall be submitted. The EMD shall be valid for 210 days from the due date of bid submission in the form of BG / Bankers Pay Order favoring "The Tata Power Company Limited". The EMD has to be strictly in the format as mentioned in General Condition of Contract, failing which it shall not be accepted, and the bid as submitted shall be liable for rejection. A separate non-refundable tender fee of stipulated

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amount also needs to be transferred online through NEFT/ RTGS in case the tender document is downloaded from our website.

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

Account Name: The Tata Power Co. Ltd.
Bank Name: HDFC Bank, Fort Branch, Mumbai
Bank Account No. : 00600110000763

IFSC Code: HDFC0000060

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

a) Documentary evidence in support of qualifying criteria
b) Technical literature/GTP/Type test report etc. *(if applicable)*
c) Qualified manpower available
d) Testing facilities *(if applicable)*
e) Signed Post Award Contract Administration (Clause 7.0)
f) No Deviation Certificate as per the Annexure III – Schedule of Deviations
g) Acceptance to Commercial Terms and Conditions viz Delivery schedule/period, payment terms etc. as per the Annexure IV – Schedule of Commercial Specifications.
h) Quality Assurance Plan/Inspection Test Plan for supply items *(if applicable)*

The technical bid shall be properly indexed and is to be submitted in Soft Copy through Ariba Portal only. Hard Copy of Technical Bids need not be submitted.

THIRD PART: "PRICE BID" shall contain only the price details and strictly in format as mentioned in Annexure I along with explicit break up of basic prices, Taxes & duties, Freight etc. In case any discrepancy is observed between the item description stated in Schedule of Items mentioned in the tender and the price bid submitted by the bidder, the item description as mentioned in the tender document (to the extent modified through Corrigendum issued if any) shall prevail.

FOR BIDS INVITED THROUGH E-PROCUREMENT PORTAL:

The interested bidders are requested to obtain username and password for purpose of bid submission through Ariba portal of TPC, Mumbai

Bids have to be mandatorily submitted only through Ariba portal of TPC. Bids submitted through any other form/ route shall not be admissible.

The EMD in the form of BG shall be submitted in original hard copy and then placed in sealed envelope which shall be clearly marked as below:

EMD

"SITC of Fully Automatic Smart Meter Test Bench for Single Phase & Three Phase Smart Meters & Conventional Meters"

Please mention our Enquiry Number:- 4100074214 on the Tender and drop the same at The Tata Power Company Limited, Smart Center of Procurement Excellence, 2nd Floor, Sahar Receiving Station, Sahar Airport Road, Andheri East, Mumbai-400059.

The envelope shall be addressed to:

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Chief (Corporate Contracts)
The Tata Power Company Limited
Smart Center of Procurement Excellence, 2nd Floor, Sahar Receiving Station
Sahar Airport Road, Andheri East, Mumbai-400059

The envelope shall also bear the Name and Address of the Bidder along with our Tender No. and subject.

3.0 SIGNING OF BID DOCUMENTS:

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

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

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

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

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

3.2 Contact Information

All the bidders are requested to send their pre-bid queries (if any) against this tender through e-mail within the stipulated timelines. The consolidated reply to all the queries received shall be shared on respective registered mail ID by the stipulated timelines as detailed in calendar of events.

Communication Details:

Lead Engineer Corporate Contracts

Name: Sanjana Ganesh Kamble (She / Her)
Contact No: 9021950281
E-Mail ID: sanjana.kamble@tatapower.com

Group Head Contracts

Name: Prasad N A Deepan (He / Him)
Contact No.: 9971395344
E-Mail ID: deepan.prasad@tatapower.com

3.3 Bid Prices

Bidders shall quote for the entire Scope of Supply/ work with a breakup of prices for individual items and Taxes & duties. The bidder shall complete the appropriate Price Schedules included herein, stating

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the Unit Price for each item & total price with taxes, duties & freight up to destination at various sites of TPC. The all-inclusive prices offered shall be inclusive of all costs as well as Duties, Taxes and Levies paid or payable during the execution of the supply work, breakup of price constituents.

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

3.4 Bid Currencies

Prices shall be quoted in Indian Rupees Only.

3.5 Period of Validity of Bids

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

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

3.6 Alternative Bids

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

3.7 Modifications and Withdrawal of Bids

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

3.8 Earnest Money Deposit (EMD)

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

- Banker's Cheque/ Demand Draft/ Pay order drawn in favor of The Tata Power Company Limited, payable at Mumbai.
- Online transfer of requisite amount through NEFT/ RTGS.
- Bank Guarantee valid for 210 days after due date of submission.

The EMD shall be forfeited in case of:

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

Or

b) The case of a successful bidder, if the Bidder does not
i) accept the purchase order, or
ii) furnish the required performance security BG.

3.9 Type Tests (if applicable)
As per attached Annexures

4.0 Bid Opening & Evaluation process.

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4.1 Process to be confidential.

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

4.2 Technical Bid Opening

Bids will be opened at TPC Office Mumbai as per the schedule mentioned in Calendar of Events. In case of limited tenders, the bids shall be opened internally by TPC. In case of Open Tenders, the bids shall be opened in the presence of accredited representatives of bidders who may choose to be present at the time of tender opening. Technical bid must not contain any cost information whatsoever.

First the envelope marked “EMD” will be opened. Bids without EMD/cost of tender (if applicable) of required amount/ validity in prescribed format, shall be rejected.

Next, the technical bid of the bidders who have furnished the requisite EMD will be opened, one by one. The salient particulars of the techno commercial bid will be read out at the sole discretion of TPC.

4.3 Preliminary Examination of Bids/Responsiveness

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

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

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

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

4.4 Techno Commercial Clarifications

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

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4.5 Price Bid Opening

Price bids will be opened at the stipulated date and time. The EMD of the bidder withdrawing or substantially altering his offer at any stage after the technical bid opening will be forfeited at the sole discretion of TPC without any further correspondence in this regard.

4.7 Reverse Auctions

TPC reserves the right to conduct the reverse auction (instead of public opening of price bids) for the products/ services being asked for in the tender. The terms and conditions for such reverse auction events shall be as per the Acceptance Form attached as Annexure VI of this document. The bidders along with the tender document shall mandatorily submit a duly signed copy of the Acceptance Form attached as Annexure VI as a token of acceptance for the same.

5.0 Award Decision

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

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

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

6.0 Order of Preference/Contradiction:

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

1. Schedule of Items (Annexure I)
2. Post Award Contract Administration (Clause 7.0)
3. Submission of Bid Documents (Clause 3.0)
4. Scope of Work and SLA (Annexure VII)
5. Technical Specifications (Annexure II)
6. Inspection Test Plan (Annexure VIII)
7. Acceptance Form for Participation in Reverse Auction (Annexure VI)
8. General Conditions of Contract (Annexure IX)

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7.0 Post Award Contract Administration

7.1 Special Conditions of Contract

- Rate shall remain FIRM till the validity of Rate Contract.
- TPC appreciates and welcomes the engagement/employment of persons from SC/ ST community or any other deprived section of society by their BAs.
- Any change in statutory taxes, duties and levies during the contract period shall be borne by TPC. However, in case of delay in work execution owing to reasons not attributable to TPC, any increase in total liability shall be passed on the Bidder, whereas any benefits arising owing to such statutory variation in taxes and duties shall be passed on TPC.
- All the terms and conditions of TPC GTC shall be applicable.

7.2 Drawing Submission & Approval

As per annexure - II

7.3 Delivery Terms

- Delivery shall be done within 3 months from the PO
- Commissioning shall be done within 6 months from Supply

7.4 Warranty Period

Warranty shall be for a period of at least 120 months from the date of commissioning or 126 months from the date of last supplies made under the contract whichever is earlier.

7.5 Payment Terms

Payment shall be released within 60 days after submission of error free bills along with relevant supporting documents & as certified by Order Manager

Payment Milestones.

- **Supply Item:**

1. 70% shall be invoiced after the 100% supply completion
2. 30% shall be invoiced after installation, testing commissioning of the supplied test benches.

- **Commissioning:**

100% of service value shall be released after successful commissioning of the meter test bench

7.6 Liquidated Damages

SLA applicable as attached.

7.7 Contract Performance Bank Guarantee (CPBG)

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Vendor shall submit irrevocable and unconditional CPBG for a value equal to 10% of the contract value, within 15 days from the receipt of contract valid till the warranty Period of Job with a further claim period of 6 months.

7.8 LD / SLA / Performance Requirement and penalties

SLA penalties applicable as per scope of work.

7.9 Other Terms & Conditions

Upon work award the successful bidder shall provide support services as listed in the scope of work and SLA.

7.10 Climate Change

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

7.11 Ethics

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

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

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

Bidder is advised to refer GTC attached at Annexure VIII for more information.

Any ethical concerns with respect to this tender can be reported to the following e-mail ID: cecounsellor@tatapower.com or via third party facility tatapower@ethics-line.com

8.0 Specification and standards

As per Annexure II.

9.0 General Condition of Contract

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

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10.0 Safety

Safety related requirements as mentioned in our safety Manual put in the Company's website which can be accessed by:

http://www.tatapower.com

All Associates shall strictly abide by the guidelines provided in the safety manual at all relevant stages during the contract period.

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ANNEXURE I
Schedule for Items

Supply					
Sr No.	**Item Description**	**UoM**	**Qty**	**Unit Price**	**Total**
1	Supply of 40 position Single Phase Smart Meter Test Bench	Each	3		0
2	Supply of 20 position Three Phase Smart Meter Test Bench	Each	2		0
Total					**0**
Incl. Taxes					**0**

Commissioning					
Sr No.	**Item Description**	**UoM**	**Qty**	**Unit Price**	**Total**
1	Installation, Testing and Commissioning of 40 position Single Phase Smart Meter Test Bench	AU	3		0
2	Installation, Testing and Commissioning of 20 position Three Phase Smart Meter Test Bench	AU	2		0
Total					0
Incl. Taxes					**0**

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Bidder to note the following points while submitting Price Offer

Bidders are advised to quote prices strictly in the above format only. Failing to do so, bids are liable for rejection.
The bidder must fill each and every column of the above format. Mentioning “extra/inclusive” in any of the column may lead for rejection of the price bid.
No cutting / overwriting in the prices is permissible.
The unit prices should be exclusive of taxes & duties which are to be indicated in separate columns meant for the purpose.

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ANNEXURE II
Technical Specifications

Attached as Annexure to this document

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ANNEXURE III
Schedule of Deviations

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

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

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

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

Seal of the Bidder:

Signature:

Name:

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ANNEXURE IV

Schedule of Commercial Specifications

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

S. No.	Particulars	Remarks
1.	Prices firm or subject to variation (If variable indicate the price variation clause with the ceiling if applicable)	Firm / Variable
1a.	If variable price variation on clause given	Yes / No
1b.	Ceiling	--------- %
1c.	Inclusive of Excise Duty	Yes / No (If Yes, indicate % rate)
1d.	Sales tax applicable at concessional rate	Yes / No (If Yes, indicate % rate)
1e.	Octroi payable extra	Yes / No (If Yes, indicate % rate)
1f.	Inclusive of transit insurance	Yes / No
2.	Delivery	Weeks / months
3.	Guarantee clause acceptable	Yes / No
4.	Terms of payment acceptable	Yes / No
5.	Performance Bank Guarantee Acceptable	Yes / No
6.	Liquidated damages clause acceptable	Yes / No
7.	Validity (180 days) (From the date of opening of technical bid)	Yes / No
8.	Inspection during stage of manufacture	Yes / No
9.	Rebate for increased quantity	Yes / No (If Yes, indicate value)
10.	Change in price for reduced quantity	Yes / No (If Yes, indicate value)
11.	Covered under Small Scale and Ancillary Industrial Undertaking Act 1992	Yes / No (If Yes, indicate, SSI Reg'n No.)

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ANNEXURE V

Checklist of all the documents to be submitted with the Bid.

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

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

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ANNEXURE VI

Acceptance Form for Participation in Reverse Auction Event

(To be signed and stamped by the bidder)

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

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

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

Signature & Seal of the Bidder

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RFQ No.: 4100074214

ANNEXURE VII

Scope of Work & Service Level Agreement

Attached as Annexure to this document.

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ANNEXURE VIII

Inspection Test Plan

NA

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Annexure IX

General Conditions of Contract

Attached as Annexure to this document.

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RFQ No.: 4100074214

Annexure X

Manufacturers Authorization Form

(To be submitted on OEM's Letter Head)

Date: …….
Tender Enquiry No.: ……..

To,
Chief (Procurement & Stores)
Tata Power Company Limited, Mumbai

Dear Associate,

Whereas M/s. [name of OEM], who are official manufacturers of ..... having factories at [Address of OEM] do hereby authorize M/s [name of bidder] to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods, manufactured by us ..... and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with the Special Conditions of Contract or as mentioned elsewhere in the Tender Document, with respect to the Goods offered by the above firm in reply to this Invitation for Bids.

We hereby confirm that in case, the channel partner fails to provide the necessary services as per the Tender Document referred above, M/s [name of OEM] shall provide standard warranty on the materials supplied against the contract. The warranty period and inclusion / exclusion of parts in the warranty shall remain same as defined in the contract issued to their channel partner against this tender enquiry

Yours Sincerely,
For …….

Authorized Signatory

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TECHNICAL SPECIFICTAION
For
Fully Automatic Forty (40) Position
Smart Meter Test Bench
for
Single Phase Smart and Conventional Meters

Document No.	TPC\MTL\TESTBENCH\2026\01	Issue No.	01
		Issue Date	05.11.2026
Revision No.	00	Revision Date	NIL
Description	**Prepared By**	**Reviewed By**	**Approved By**
	Himali Patel	**Rahul Ranadive**	**B Karunakaran**

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1.0	**INTRODUCTION**	This Specification covers the technical requirements of design, engineering, manufacturing, testing at manufacturer's works, packing, forwarding, transportation, Supply, Installation, Testing and Commissioning of 40 positions, fully automatic smart test bench with reference Meter of Accuracy Class 0.05. Tata Power would like to invite offers from qualified suppliers having a strong development and state-of-the art production facilities and an extensive experience in supply, installation and commissioning and after sales services of energy meter test equipment's. The supplier to be selected for this tender shall have the requisite hands-on experience of supplying similar kind of test equipment in India or comparable emerging countries.
2.0	**PRE QUALIFICATION REQUIREMENT:**	The offer of those tenderers, who fulfill following criteria, shall only be considered: 1) The bidder shall be original equipment manufacturer /Indian Partner having ISO 9001 certification and ISO/IEC 17025:2017 Accreditation facility and has at least 10 years of experience in design / manufacturing and supplying, installation, testing, commissioning and maintenance for similar or better meter test equipment in India. Certificate of ISO 9001 & ISO/IEC 17025:2017 shall be submitted along with bid. Any association with any Laboratory will not be considered. 2) The bidder must have supplied at-least 03 nos. meter test system of similar specifications and the same are in operation successfully in India for more than 2 years at a NABL Accredited Laboratory/ Meter Manufacturer/ DISCOMs as on bidding date. Necessary purchase order copies shall be submitted along with the bid. 3) Bidder shall submit at least 3 performance certificates showing satisfactory operation for more than 02 year from NABL accredited laboratory / Utilities / Govt. Dept. of India / Any reputed organization. The work against these issued certificates should be completed in last five years from the date of bid submission. In case the bidder has a previous association with Tata Power for similar products and services, the performance feedback for that bidder by Tata Power's User Group, shall only be considered irrespective of performance certificates issued by any third organization. (Please note that Performance Certificate should not be older than 5 years form due date of submission of bids). Technical performance, delivery timelines, service and support records of past executed projects in Tata Power will be considered for technical evaluation of bidder. The bidder shall submit a list of important customers served, with documentary evidence along with the offer. Purchaser has right to directly contact concerned laboratory regarding performance of the Meter test benches.

		4) The average annual turnover of bidder of last three (3) financial years should be at least Rs. 10 Crores. Bidder shall submit notarized audited financial reports for the last 3 financial years in support of proving the financial standing of the bidder. 5) The bid shall be submitted by the manufacturer or their sole authorized representative duly supported by certificate of authorization.
3.0	**SCOPE OF SUPPLY**	This specification covers single point responsibility turnkey contract including design, engineering, manufacturing, testing, packing, transportation, delivery, installation and successful commissioning of fully automatic high precision computer controlled 40 position single phase stationary meter test system (referred hereafter as "MTS") for testing single phase two wire energy meters, putting into operation and establishing the successful performance during the performance guarantee including all other incidental services required for the satisfactory performance of the system as per international codes and standards. **The meter test system shall be suitable for simultaneous testing of single-phase energy meters in both phase and neutral circuit as well as to provide facility for doing routine, acceptance and special tamper tests on link-less (closed Link) single-phase meters on main element, Neutral element and main & neutral element together, automatically without any manual connection/ disconnection.** The supply shall consist of a) Power source Unit b) Reference Standard Meter c) Scanning Heads d) ICT (Isolation Current Transformer) and MSVT (multi secondary voltage Transformer) e) Meter Test bench suspension Rack with quick connecting system f) Meter communication system g) Software h) Individual Error Indication & Evaluation System In addition to above, the scope of supply shall also include the following:

a) Copy of software in Secured cloud-based download in English Language for operation of the equipment

b) All accessories including voltage cables, current cables, scanner head etc.

c) Operational and maintenance manuals including drawings

d) Training to at least five people on all aspects of operation and maintenance of the equipment at Laboratory

e) List of spares and consumables

f) Continued technical support

The scope does not include the computer hardware and printer; however, the bidder shall suggest the specifications of the same along with the technical offers.

Tolerances on all the dimensions shall be in accordance with provisions made in the relevant IEC/Indian standards and these technical specifications. Otherwise, the same will be governed by good engineering practices in existence.

It is not the intent to specify completely herein all the details of the design and construction of material. However, the product shall conform in all respects to high standards of engineering, design and workmanship and shall be performing in continuous commercial operation in a manner acceptable to the purchaser.

The offered material shall be complete with all components necessary for their intended purpose. The design, manufacture and performance of equipment shall comply with all currently applicable standards, regulations, and safety codes in the locality where the equipment will be installed. Nothing in this specification shall be construed to relieve vendor of this responsibility.

- **Suitable Online UPS with minimum one-hour battery backup,** adequately rated to meet the test bench load requirements, shall be supplied by bidder along with each Meter Test System (MTS).
- **The selected bidder shall buyback Tata Power's existing old meter test benches against the new supply.** (2 nos. 48 position meter test benches, Songyang make, 0.05 class). Benches to be picked up from Matunga Lab, Mumbai at bidder's cost.
- **Yearly on-site calibration** covering complete electrical measurement range shall be carried out by bidder through NABL-accredited laboratory for another 9 years, i.e., from the 2nd year to the 10th year after commissioning of test benches. (Load points will be covered as per entire range of all electrical parameters)

  If any drift or deviation is observed during calibration, bidder shall rectify the same and perform necessary re-calibration at no additional cost to the purchaser.
- Tata Power is in the process of developing new laboratory infrastructure where these test benches will be installed. In the event that infrastructure is not ready at the time of equipment supply, **the bidder shall still remain responsible for ensuring successful**

installation, commissioning and performance testing of entire Meter Test System. Any delay or extended gap between the supply and installation of equipment shall not relieve the bidder of these obligations, and the bidder shall provide all necessary support to ensure successful completion of the project.

- Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser **up to a period of at least 120 months from the date of commissioning or 126 months from the date of last supplies made under the contract whichever is earlier.**

Mandatory Technical Requirement:

1) All components like Source, Reference Standard Meter, Error evaluation & digital system, Isolation Current Transformer, MSVT, Scanning Head, Aluminum Test Rack of Meter Test System should be **only from one manufacturer** to provide better integrity and after sales of offered product
2) The Bidder should declare that he is not been ever black listed /defaulter by any utility/ DISCOMs/Distribution Company/ Laboratories/ Any department of State Government or Centre Government on record of poor performance such as not properly completing the contract, inordinate delays in supply completion, not supplying the items as per commitment of contract etc.
3) The Bidder should have its own fully equipped service center and trained engineers dedicated for trouble shooting and technical support permanently posted in India. The bidder shall enclosed necessary proof that he has necessary facility to adjust and calibrate the offered measuring unit within the country. **List of Plant and Machinery, tools and tackles** to carry out service shall be submitted along with offer. Bidder shall have to submit **purchase order copies of Annual Maintenance Contract (AMC)** of at least five no. of fully automatic meter test benches.
4) Major components used in the test bench like voltage and current amplifier, reference standard meter, all other accessories shall confirm to safety requirement i.e. having CE mark.

LOCATION:

The meter test system shall be installed and commissioned at the locations specified as below-

The Tata Power Company Limited, Dharavi Receiving Station, Near Shalimar Industrial Estate, Matunga, Mumbai 400 019, Maharashtra

Tata Power reserves the right to change installation location of the equipment based on business requirements. The same shall be initiated to vendor in advance and vendor shall provide necessary support for successful installation and commissioning at revised location.

4.0 APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions of relevant Indian/ IEC Standards and shall conform to the regulations of local statutory authorities.

Purpose	Applicable
Meter Testing	IS12346:1999
Smart Energy meters and Static Energy Meters	IS14697, IS13779, IEC 62052-11, 62053-11, 21, 22, 23, IS16444 (Part 1 & 2). IS15959 (Part 1, 2, & 3)
Safety	IEC 61010
Meter Testing Equipment	IEC 62057-1, IS 12346, IS15707

All standards latest amendments also shall be applicable.

5.0	**GENERAL TECHNICAL REQUIREMENTS**	
5.1	**APPLICATION**	To provide facilities for carrying out routine, acceptance and certification test on all types of electronic single phase meter & Portable Reference meters in Active, Reactive & Apparent Mode.
5.2	**OPERATING CONDITIONS**	The meter test equipment shall be suitable for giving an uninterrupted service in following conditions: a. Ambient temperature (-) 10°C to (+) 45°C for operation and from (-) 10°C to (+) 60°C for storage. b. Relative humidity up to 95%. c. Mains voltage shall be 3x240V ± 10% d. Frequency 50Hz ± 5 %. e. Cabinet for source must be dust proof. The bidder shall furnish the details of environmental parameters which are to be maintained with the list of equipment to control the same.
5.3	**TEST TO BE PERFORMED**	The offered meter test system shall be capable to perform the following tests on the meters as per IEC 62052-11, 62053-11, 21, 22, 23, IS16444 (Part 1 & 2), IS15959 (Part 1, 2, & 3) IS14697 and IS13779 using frequency output /LED pulse output method. a) Simultaneous calibration/ testing of ERS Meter b) Pre-warming c) Accuracy test as per IS/IEC d) Starting current test e) Creep test (No load Test) f) Dial test g) Connect/Disconnect testing of Load switch during ON & OFF Load condition for all meters simultaneously and its auto reporting h) Influence quantity test related to accuracy test • Voltage Variation, Frequency Variation • Neutral disconnection • Influence of Harmonic component in voltage and current circuit, odd and sub harmonic, DC and Even Harmonics and Voltage dip (50% of Vref) and interruption test (20ms). • Facility to simulate all influence qty test in phase and neutral channel both. i) Testing of communicable Smart meters • **Communicate with Smart meter on its Optical Port.** • **Communicate with Smart meter on its GPRS/RF communication port** • Verification of Smart meter functionality for Routine test. • Automatic Burden measurement(Power measurement of voltage and current circuit) of the smart meter for minimum 5 meter position • Verification of electrical tamper conditions. • Stress test. • Automated testing of End to End (API/HES) Communication Test. • Any other tests as per relevant IS/IEC Standards • **Programming verification** as per IS requirement In addition, the offered meter-testing system shall be capable to perform the

		following tests on RSS and ERSS under testing using frequency output of built-in ERSS. j) Accuracy testing of reference standard used into test system against high precision reference standard k) Accuracy testing of reference standard (low accuracy) against the built-in reference standard. Note- Phase and Neutral circuit should be tested independently without changing connection physically. It should also be possible to test meters like Real time installation (Phase and Neutral elements, together automatically without any manual interventions)

6.0	**GENERAL CONSTRUCTIONS**	
6.1	**CONSTRUCTION AND COMPONENT OF SYSTEM**	The complete system shall consist of at least the following essential components, specifications of which are defined hereinafter in this document. 1. Cabinet to house power source and RSS 2. Static Power Supply Unit 3. High Precision Reference standard meter 4. Meter mounting Rack with Quick Connecting system 5. Scanning heads 6. Individual Error calculators and indication system 7. Optical/ RS232 Communication system with each MUT (meter under test) 8. Isolating current transformers 9. Windows based Software to operate the system The source shall be easily programmable so as to give: a) Reference output frequency independent of mains, with quartz-controlled operation range from 40 Hz. to 70 Hz. in steps of 0.01 Hz. with high efficiency, power-factor compensation according to IEC 60555. b) Stability at inductive, capacitive and non-linear loads for the power factor. c) Protection against overload and short circuit and provision for superimposition of harmonics in the range of 2nd to 40th harmonics. Power Factor compensation shall be provided as per IEC 60555 so that the meter-testing system shall draw purely sinusoidal current from the mains A.C. supply without polluting it. All the material and electronic Energy components used in the manufacture of the meter test system shall be of highest quality and reputed make to ensure higher reliability and longer life and trouble-free operation. The equipment should be compact and reliable in design, rugged for rough handling during commercial use. It shall be able to sustain its metrological properties under the operation in tropical environment. All insulating material used in the construction of the equipment shall be non-hygroscopic, non-aging and of tested quality. All parts, which are subject to corrosion under normal working conditions, shall be protected effectively. Any protective coating shall not be liable to damage by ordinary handling or damage due to exposure to air, under normal working conditions. In the event that any corrosion, deterioration or failure of protective coating is observed during guarantee period, the bidder/OEM shall replace affected parts at no additional cost to purchaser. The meter test system shall be designed and constructed in such a way as to avoid

		introducing any danger in use and under normal conditions so as to ensure specially: • Personnel safety against electric shock - Suitable measures like **safety covers** (i.e. transparent acrylic sheet) on each quick connector and auto cut **air curtain** (With Enable/Disable facility) system shall be provided to ensure safety of testing personnel during the operation. • Personnel safety against effects of excessive temperature. • Protection against spread of fire • Protection against penetration of solid objects, dust and water. All major components used in the test bench like voltage and current amplifiers, reference standard meter, all control switch gears & scanning head device etc shall have compliance to applicable IEC/IS standard.
6.2	**CABINET**	The cabinet housing the power source and Reference Standard Meter (RSM), including all associated components and accessories, shall preferably be of 19" standard rack-mounted type or an equivalent suitable design. 1. The cabinet shall be designed to accommodate the power source, Reference Standard Meter and all associated components in an organized and accessible manner. 2. The cabinet shall be provided with suitable doors to facilitate easy opening and closing for inspection, maintenance and servicing. The doors shall be lockable to restrict access to authorized personnel only. 3. In case of a closed-type cabinet, suitable cooling fans or an equivalent cooling arrangement of adequate capacity shall be provided to maintain the internal temperature within the specified operating limits of the installed equipment during normal operation. 4. With the doors closed, the cabinet shall provide a minimum degree of protection of IP31 or better. 5. The cabinet shall be provided with suitable protective earth terminals. Proper earthing of the cabinet shall be ensured during site installation and commissioning. 6. The cabinet shall have one mains-switch to switch off the incoming power supply. **7. The cabinet shall be installed below the meter test rack to optimize floor space utilization and ensure an ergonomic and compact arrangement of the complete test bench system. RSM(Reference Standard Meter) shall be kept on top side within cabinet for ease in reading the parameters.** 8. The cabinet shall have a dust-resistant and neatly organized internal wiring arrangement. All cables and wires shall be properly routed, secured and concealed within the cabinet or through suitable cable ducts/trunking.

		The design shall ensure adequate protection against mechanical damage and prevent rodent ingress. **No loose or exposed wiring shall be visible outside the cabinet when its doors are closed.** 9. The cabinet design shall facilitate easy access for maintenance while ensuring adequate ventilation, cable management, electrical safety and protection against dust ingress. **The manufacturer shall ensure that heat generated by the power source and other installed components does not adversely affect the accuracy, stability or operating performance of the Reference Standard Meter.**
6.3	**SPECIFICATION OF STATIC POWER SOURCE**	The static Power Source Unit, shall fully be computer controlled, designed as a standard cabinet of modular structure including voltage and current amplifier units, signal generator unit for generation of phase angle & frequency and super imposition of harmonics with all the necessary controlling, indicating & display features. The output power of the power source shall be suitable for direct connection to the meters without removing the potential link in the voltage coil circuit of the meters. The accuracy of the system should remain unaffected even when the power source is directly connected to unregulated mains. The static power source unit shall have a high Precision, wide range Single phase electronic reference Standard meter with auto ranging facility, directly connected (without any use of CT /PT) to the test circuit. The static power source unit should have auto-range selection facility and serial communication port (s) for communicating with PC and the meter under test. The power source shall have adequate over-current and short circuit protection. The source shall be able to generate voltage interruption and voltage dips as specified in IS 13779, IS 14697 and CBIP 325. The source shall be easily programmable so as to give: • Reference output frequency independent of mains, with quartz-controlled operation range from 45 Hz to 65 Hz or better range in steps of 0.01 Hz with high efficiency, power-factor compensation according to IEC 60555. • Stability at inductive, capacitive and non-linear loads for the power factor. • Protection against overload and short circuit and provision for superimposition of single and multiple harmonics up to 40% of fundamental waveform over the range of 2nd to 40th harmonics in steps of 1% or better. Facility to control phase angle of harmonics shall be provided. • Star system (phase angle 120°) • Any asymmetrical system • Computer controlled adjustment of star system (120°) or asymmetrical system in steps of 0.01°

<table>
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- Any non-balanced system

Power Factor compensation shall be provided as per IEC 60555 so that the meter testing system shall draw purely sinusoidal current from the mains A.C. supply without polluting it.

</td></tr>
<tr><td>6.4</td><td>SPECIFICATION OF VOLTAGE AMPLIFIER</td><td>
The voltage amplifier used in the Source shall be a digital resonant switch mode voltage amplifier. It should have closed control conception of the frequency generator for high stability and high precision of test voltage. It should have output VA burden rating not less than 1000 VA. The electronic voltage amplifier shall be computer controlled and should allow step less & continuous adjustment of output voltage for testing of meters.
The voltage amplifier should have following capabilities and features:
<table>
<tr><th>S. No.</th><th>DESCPRITION</th><th>MEASURMENT</th></tr>
<tr><td>1.</td><td colspan="2">Electronic protection against Overload and Short Circuit.</td></tr>
<tr><td>2.</td><td colspan="2">LED indication for faults like overload, short circuit and power supply failure shall be provided.</td></tr>
<tr><td>3.</td><td>Output voltage range</td><td>30 -480 V (Phase-Neutral)</td></tr>
<tr><td>4.</td><td>Output VA burden rating</td><td>Not less than 1000VA/phase</td></tr>
<tr><td>5.</td><td>Efficiency</td><td>Better than 85%.</td></tr>
<tr><td>6.</td><td>Stability</td><td>100 ppm / h, or better with integration time of 60 seconds</td></tr>
<tr><td>7.</td><td>Distortion factor</td><td>< 0.5 %.</td></tr>
<tr><td>8.</td><td>Provision for super-imposing of harmonics</td><td>2nd to 40th harmonics</td></tr>
<tr><td>9.</td><td>Maximum possible DC content</td><td>< 0.05 %</td></tr>
<tr><td>10.</td><td>Accuracy of the test setting amplitude</td><td>0.05 % or better</td></tr>
<tr><td>11.</td><td>Accuracy of the test setting phase adjustment</td><td>0.01° or better.</td></tr>
</table>
</td></tr>
<tr><td>6.5</td><td>SPECIFICATION OF CURRENT AMPLIFIER</td><td>
The current amplifiers used in the Source shall be digital resonant switch mode type amplifiers. It should be closed control conception of the frequency generator for high stability and high precision of test current. It should have output VA burden rating not less than 2400 VA per phase. The electronic current amplifier shall be computer controlled and should allow step less & continuous adjustment of output current for testing of meters.
The current amplifiers should have following capabilities and features:
<table>
<tr><th>S. No.</th><th>DESCPRITION</th><th>MEASURMENT</th></tr>
<tr><td>1.</td><td colspan="2">Electronic protection against open circuit and over load.</td></tr>
<tr><td>2.</td><td colspan="2">LED indication for faults like overload, open circuit and power</td></tr>
</table>
</td></tr>
</table>

			supply failure shall be provided.	
		3.	Output Current range	1 mA to 120 A
		4.	Output VA burden rating	Not less than 2400VA/phase
		5.	Efficiency	Better than 85%.
		6.	Stability	100 ppm / h with integration time of 60 sec
		7.	Distortion factor	0.5 %
		8.	Provision for super-imposing of harmonics	2nd to 40th harmonics
		9.	Maximum possible DC content	< 0.05 %
		10.	Accuracy of the test setting amplitude	0.05 % or better
		11.	Accuracy of the test setting phase adjustment	0.01°
6.6	**SIGNAL GENERATOR (FREQUENCY / PHASE ANGLE)**	The signal generator shall be digitally controlled to give output frequency independent of mains supply with provision to vary the output frequencies from 45 Hz to 65 Hz or better range in steps of 0.01 Hz. The output power factor adjustment shall be computer controlled and shall allow step less & continuous adjustment of power factor from 0.0 to 1.0 in all four quadrants in the steps of 0.01 or better, without affecting the test voltage or test current. Quick selection of any power factor shall be available / possible through meter testing software.		
6.7	**SPECIFICATION OF ELECTRONIC REFERENCE STANDARD METER (RSM)**	The class of accuracy of reference standard shall be 0.05% or better for active and reactive ranges, over the entire measurement load range & independent of the measuring mode. Current range of reference standard shall be 1 mA... 120 A direct connected and voltage range from 10-480 V (phase - neutral), selectable through PC. The offered reference meter can be interchangeable with same make of tests system. Reference standard shall have auto-range selection facility and facility of dial test (power dosing) and RS 232 serial communication port for communicating with PC. It must frequency output proportional to the power to calibrate against better standard		

S. No.	DESCPRITION	MEASURMENT
1.	The class of accuracy of reference standard should be 0.05 or better	0.05 or better
2.	Measuring modes	2 wire active, reactive & apparent mode
3.	Frequency Range	Basic frequency 40-70 Hz and total detectable frequency range 0…3000 Hz
4.	Voltage Range	10-480V (phase - neutral)
5.	Current Ranges	▪ 1 mA to 120 Amps. (working range) ▪ 10 mA to 120 Amps. (measurement range)
6.	Accuracy – Power / Energy (For active and reactive measurement)	0.05 % for Active/Reactive/Apparent measurement: E ≤ ± 0.05% at Cos =Sin ϕ >= 0.5 For measurement range (I >10mA-120A) ; 10-480V ; 0.05%/PF at Cos ϕ =Sin ϕ <0.5 E ≤ ± 0.1% at Cos ϕ = Sin ϕ >= 0.5 For measurement ranges (I>1mA-10mA) ;10-480V 0.1%/PF at Cos ϕ =Sin <0.50
7.	Voltage Accuracy	0.02 % for the range of 10 V to 480 V (P-N)
8.	Current Accuracy	0.02 % (10 mA to 120 A) 0.05 % (1 mA to <10 mA)
9.	Phase Angle Accuracy	< 0.01°
10.	Voltage, Current & Power measurement drift	equal to or better than 100PPM / year (Drift for individual parameters shall be defined clearly in the offer.)
11.	Temperature coefficient	10PPM/ K or better (Bidder Should submit certificate of Reference standard along with Bid to specify the temperature coefficient of Reference standard)
12.	**Display -**The RSM shall have inbuild display for display following parameters.	– Phase wise and total three phase active, reactive and apparent Power/energies – RMS value of Phase to Phase and Phase to neutral voltages – RMS value of Phase wise currents – Phase wise power factor and total three-phase power factor for active as well as reactive component. – Phase angle between voltage and current vectors phase wise

				– Phase angle between the phase voltages – Mains Frequency – Voltage & Current display in waveform shape (Graphics Display in software) – Content of harmonics analysis & display for voltage, current, power (Active, Reactive & Apparent) in tabular form (total and phase wise) – Voltage & Current Phase sequence – Calculated error between the reference standard meters and the meter under test – Elapsed time from the beginning of the test – Number of disc revolutions or pulses from beginning of the test The selection facility shall be provided to select **minimum 8 parameters** out of these parameters. The RSM shall have facility to maintain last setting when it is switched off.
		13.	**Integration time**	Facility to select integration time between 1 to 99 second shall be provided in the RSM.
		14.	**Operation**	Membrane key board with membranes push button to operate the RSM shall be provided in the front of the RSM. Human touch based display is also acceptable.
		15.	**Reference Channel**	The RSM shall have facility to select reference for phase angle measurement. Selection of reference shall be provided manually and automatically.
		16.	**Frequency output**	This shall provide frequency output proportional to power to calibrate the reference standard against high precision reference standard. This output shall be in commonly used BNC type socket.
		17.	**Calibration**	The reference meter shall be provided along with calibration certificate from **national/international accredited laboratory**.

6.8	**SPECIFICATION OF HARMONIC INJECTION UNIT**	Over the range 0 to the 40th harmonics to the test voltage and test current, the magnitude of each harmonic shall be adjustable from 0-40% of the fundamental wave and the maximum peak value of the wave form shall be 130% of the magnitude of the fundamental wave. Facility of controlling the phase angle of harmonics shall also be provided. Necessary proof for generation of wave form and desired harmonics shall be submitted along with offer. Voltage output THD ≤0.3% Current output THD ≤0.5% The super-imposition of harmonics shall be possible to carry out all the tests prescribed at **Clause 5.3.**
6.9	**SPECIFICATION OF METER MOUNTING RACK**	a. Two nos. of separate single sided Meter Mounting Racks(with Top Bottom arrangement) shall consist of a lightweight aluminum frame for mounting of sensor heads, display devices and meters-under-test. (20 position in each rack). Both racks are independently and shall have possibility to keep in series or in L-Shape. b. There shall be suitable provision for both vertical and horizontal adjustment of scanners so that each meter position shall be accessible by the scanning head. c. Design of the frame should be such that 40 Nos of energy meters of any type Single phase can be safely and easily accommodated on it. d. The meters shall get connected to the voltage and current circuits by means of color coded cables & quick connection device suitable for phase and neutral channel testing without manual intervention. e. The meter test rack shall have the facility /suitable ports to download data from internal memory of the meter under test from every test position. f. The meter test rack should have the facility to accept high frequency input to test RSM (reference standard meter) equal to the number of test meter positions. g. Necessary BNC type socket or any other suitable arrangement shall be provided on the Meter Mounting Rack to test the inbuilt RSS against a precision standard of higher accuracy without removing the inbuilt ERSS from the source cabinet. h. The offered software shall have facility to test the RSS in automatic mode by using these BNC type sockets i. Necessary cables shall be provided along with equipment to test RSS having frequency output on BNC type socket j. Facility to perform warm-up of Meter under Test before the testing shall also be provided. k. The internal wiring (current, voltage, etc,) are fully accessible by removal of covers. Current terminals provided on rack shall be so arranged to test any number of meters within above specified limits.

		l. The mounting rack shall have following features: i. Scanning head at each meter test position with mounting arrangement. It can be adjustable both in depth and height. ii. Error indication at each test position. iii. Meter mounting frame with suitable cable leads iv. Two Emergency switches on each meter suspension rack to switch off the complete supply from either of the switches in case of any emergency. v. **Separate Warning lamp to indicate** – 1) Test bench ON, V&I OFF, 2) Test Bench ON & V ON only, 3) Test bench ON & V&I both ON (test in progress condition). vi. Test rack should be easily moveable equipped with 360-degree rotating wheels and lock with adjustable height. vii. It shall have a visual and audible signal to indicate over-voltage and over-current conditions. viii. The MTS should be capable to withstand surges and voltage spikes by providing necessary isolation and/or suppression system built-in the meter. m. All the component including Source, reference meter, PC System along with quick connector cable shall be concealed in the meter test rack itself, any separate cabinet is not be provided. n. The rack which accommodates the source component in 19" rack mounted type arrangement shall be designed in such a way that temperature shall not increase abnormally during normal operation. Necessary display/indicator on rack shall be provided to continuously display the temperature inside 19" rack mounted type arrangement. o. Suitable measures like **safety covers** (i.e. transparent acrylic sheet) on each quick connector and auto cut **air curtain** (With Enable/Disable facility) system shall be provided to ensure safety of testing personnel during the operation. p. The offered meter test system should be capable to carry out following tamper tests simultaneously – • Accuracy test for single phase meter for Phase element, Neutral element, Phase & neutral element combined together automatically without any manual connection/disconnection. • Accuracy test for single phase meter in case of reverse power for Phase & Neutral channel for same magnitude of current. • Facility to disconnection neutral simultaneously for all meters. **Compact and reliable meter mounting rack design shall be preferred** to optimize space utilization.

6.10	SPECIFICATION FOR SCANNING HEAD AND ERROR INDICATION UNITS	**SCANNING HEAD:** a. Adequate number of scanning heads capable to detect the rotor mark of electromechanical (Ferraris) meters and infrared LED pulse detection of hybrid or static meters shall be provided. b. During testing, these photoelectric scanners shall give optical indication of pulses by LED to indicate the status of scanning/ sensing. Each scanning head shall also have a provision of selector switch to select either to scan the marking on the disk or the pulse LED or LCD pulse. c. Each scanning head should be designed in such a way that the scanning head can be fixed easily in a position which would facilitate accurate and proper testing of the meter-under-test. The scanners shall be suitable for fine adjustment in all three directions (vertical, horizontal and z-axis i.e. nearer and farther to the meter). d. The scanning head should be insensitive to ambient light. It should give optical indication of pulses by LED. The scanning head must be CE compliant to shut out the external ambient influence. e. The scanning head must be able to measure LED pulse output (as per IEC 62052-11, clause 5.11) of frequency up to 1 kHz. f. Mounting arrangement for scanning head should have facility to move vertical, horizontal, forward and backward directions. **ERROR INDICATION UNITS:** a. For simultaneous error measurement of meters under test, each meter position in the test rack shall be equipped with individual error calculator (LED) display unit. Display resolution for error shall be ±00.000% (5 digits) or better with dynamic decimal point and configurable by software. b. An Error Indication Device shall be mounted on each test position. There shall be provision on the error indication unit to reset the error or to repeat it if something is found wrong. The same should have acknowledgement function while doing testing of starting current and creep tests manually. c. The error calculator unit shall have reset button to reset the error and repeat if required. d. Error indication unit shall indicate the % error along with ± sign during accuracy test and also count the number of edge or pulse during the starting and creep test. e. The system shall have the facility to download data from internal memory of the meter under test from every test position. For the purpose of the communication. The bidder shall provide RS 232 / RS 485 / ethernet communication interface at every measuring position for downloading of data from MUT based on IEC 62056 Mode C communication / DLMS communication protocol. f. The Error evaluation system at every measuring position shall display the following parameters during test.

		i. Remaining pulses / timing of MUT during error test ii. Pulse counter during constant test iii. Text Display during Attributive test iv. Position Malfunction indication g. Display unit digit should be properly readable.
6.11	**SPECIFICATION FOR DIGITAL PROCESS UNIT**	For the simultaneous error measurement of 40 meters under test, the basic unit shall be equipped with: The system should be Communication Interface free. i. 40 inputs for scanning head pulses. ii. 1 input for reference output iii. 1 interface for connection with PC. iv. Controlled output for Dosage Operation (Dial Test).
6.12	**MULTI SECONDARY VOLTAGE TRANSFORMER (MSVT) & ISOLATING CURRENT TRANSFORMER (ICT)**	The automatic test bench shall be supplied with Multi Secondary Voltage Transformer (MSVT) connected to the voltage circuit on the test rack, suitable for simultaneous testing of forty meters in close link condition. **The MSVT shall have following attributes**: No of windings : 42 Nos Primary voltage : 10-300 Volts Secondary voltage : 10-300 Volts Range of secondary burden : Min. 25 VA / winding Error prim / Sec (Ratio Error) : ≤ ±0.05% Error prim / Sec (phase Error) : ≤ ± 1 min Error between sec winding : ≤ ±0.02%≤ ±1 min **A certificate of offered MSVT from NABL Accredited lab shall be provided along with bid, to verify the asked accuracies.** The meter test system shall be equipped with MSVT and ICTs to test each position i.e. 40 Nos. energy meters for both Main and Neutral elements with accuracies as follows: **Technical details of ICTs are.** The test bench shall have lightweight electronically compensated independent Isolation current transformers (ICT) suitable to test 40 nos. energy meters in closed link condition simultaneously. The bidder shall provide details of proposed system, indicating nos. of ICTs & MSVTs to meet the requirements. The provision shall be such that it allows to test • The main element of Single-phase Meter • Neutral element of Single-Phase Meter

- MAIN & NEUTRAL element of Single-Phase Meter at the same time such as filed conditions .

The ICT shall have protection facility & auto connection and disconnection of secondary circuit in case no MUT connection is made on the secondary side. This should be visually displayed on every ICT.

The rated current ratio of ICT shall be 1:1.
The ICT shall have following attributes.

Nominal Primary Current	100A
Maximum Primary Current	120A
Nominal Secondary Current	100A
Maximum Secondary Current	120A
VA rating	50VA @ 120A
Operating Burden (Maximum)	5 m Ω
Ratio error	0.02 % (100 mA … 120 A) or better
Angle error	1 min (100 mA … 120 A) or better
Additional error in MTS	0.01 % (typical)

The bidder shall also provide the performance details (Ratio Error, Phase Error and Additional error in Meter Test System for the current range from 10 mA to 100mA.

A certificate of offered ICT from NABL lab shall be provided along with bid to verify the asked accuracies.

- There shall be provision to bypass the individual or all ICT automatically when secondary of ICT is kept open. Sufficient protection shall be provided to protect the ICT in case if secondary of ICT remain open while full load is running in primary. Suitable cables along with male and female plug-in type connectors shall be supplied along with the system to short all the ICTs without using any tool. This arrangement shall be provided by providing the necessary connectors on the Meter Mounting Rack.
- Manufacturer should take care of ICT response to load switching of Smart meter.
- LED indication shall be provided on ICT to indicate healthiness of ICT.
- Secondary of ICT shall be designed in such a way that its secondary leads can be connected directly to Meter under Test. Ring type of design with loose primary/secondary type of connection shall not be provided. ICT's secondary & primary windings shall be permanently wounded on core with multiple turns.
- Primary connection of ICT shall be fixed type and all primary connection on each ICT terminal shall be connected permanently. Primary & Secondary leads of ICT shall be designed in such a way that it can carry its maximum Current i.e. 120A for 2 hours continuously without any malfunction in ICT.
- LED indication shall be provided on ICT to indicate healthiness of ICT.

		• Associate Software shall have facility to indicate fault in ICT like open circuit and over load on PC. It shall have facility to display message on computer screen about any fault in ICT during testing of meters. • All ICTs shall be fixed in the test rack. ICTs placement on top of the test rack shall not be provided.
7.	**CONNECTION CABLES AND QUICK CONNECTING SYSTEM**	• Apart from connection cables required to install and commission the meter test system itself, supplier shall provide complete set of connection cables for meters under test. The cables shall have to be colour coded (Red for Phase circuit & Black for Neutral circuit current cables). In addition to above, the supplier shall provide following additional cables as spares as a part of the supplies. a. 2 set of colour coded voltage cables – (1 set shall have 2 nos. voltage cables for Red-Black) b. 2 set of colour coded Current cables – (1 Set shall have 1 nos. current cables for R-phase having capacity upto 120A) c. Current shorting cable for each bench d. Any other connection cable required for testing of MUT (Meter Under Test) and calibration of DUC (Device Under Calibration) • Every measuring position on the meter test rack shall have quick connection system. This feature is highly desirable for fast connection and disconnection of MUTs. The construction of quick connection system shall be modular to enable mounting of Single-Phase meters of different make. The quick connection for current shall be rated for 120A current maximum for at least 2 hours. **The bidder shall supply additional 2 nos. of quick connector devices with as spares for continuous operation**. • All voltage connection cables shall be adequately insulated and shall comply with the applicable minimum CAT III safety requirements as per IEC 61010. • **The QCD (Quick Connector Device) shall be provided with a transparent, insulating safety glass cover** to prevent direct contact to live parts during testing. • QCD (Quick Connector Device) arrangement shall be designed to securely hold Meter Under Test (MUT) at all times. The meter shall remain firmly fixed during testing through a robust spring-loaded clamping mechanism, ensuring reliable electrical contact and preventing any movement of the meter during testing.
8.	**SPECIFICATION OF COMPUTER SYSTEM**	The operating of the test equipment, the display of the actual values, the processing and display of the test results and the printout of the test results, reports etc should be effected by the associated Desktop Personal Computer system. The bidder shall specify the minimum specification of the computer system required for operating the MTS. The Desktop PC shall be connected to the measuring device and Energy source and necessary leads and cables for making these connections shall be provided by the vendor as a part of the system.

		Necessary requirement of any special ports in PC shall be intimated in advance. Computer system and printer will be in scope of Tata Power and will be in domain network of Tata Power where access to USB port is prohibited and under restricted network. Vendor to supply test bench and software which can be communicated and integrated to Tata Power domain network PC.
9.	**SPECIFICATION OF TEST SOFTWARES**	The meter test system shall be supplied with user friendly testing software having following features / attributes: 1. The MTS software system shall provide automatic testing of Ferraris and static meters against reference standard meter and enable computer-controlled error testing of meters. The software shall allow simultaneous testing of all meters under test having different meter constant but same voltage and current ratings. 2. The MTS software shall run on a personal computer under 64-bit with Microsoft® Windows™ Operating System of Windows 11 and above. The bidder shall ensure to provide periodic free of cost updates within the guarantee period with advancement/ upgradation in Operating systems. 3. The application software in English language shall be windows based and user friendly to facilitate sequential (fully automatic) and continuous mode (manual) of testing on meters. 4. The system must store all data in a relational-type database which also has the capacity to manage the objects. The preferred database for this application would be Microsoft SQL Server or Oracle. 5. The manual mode of operation of the licensed proprietary software of the meter-testing equipment shall allow, at least, performance of the following tasks: • Controlling of the source • displaying of test parameters (actual values) on PC screen • displaying the waveform of output voltage and current and harmonics analysis • Performance of the accuracy tests 6. The automatic mode of operation of the licensed proprietary software of the meter-testing equipment should have different modules to prepare meter test- sequence so as to carry out the testing in fully automatic mode. These modules shall be designed in such a way that user can prepare the test sequence very easily. The licensed proprietary software of the meter-testing equipment shall allow, at least, performance of the following tasks: • User interface to operate the system: • Easy to prepare test-tables by using “drag & drop“ or selection concept (it shall be user friendly)

		• Supervision and control of test procedure • Supervision and display of the test current and voltage • Indication of the errors of the meters-under-test • Evaluation of the test results and generation of test-reports in user defined format • Manual testing and automatic testing facility • **Also manual testing facility with panel keys to be possible without operating software and PC**. • Facility to define test parameters in terms of percentage and absolute terms • Facility to define error limit in two levels • Facility to change resolution of error • Facility to protect the system from over voltage in manual mode and automatic mode • Facility to check meters for short circuit and open circuit conditions prior to starting of the testing in fully automatic mode for each sequence • Facility to interrupt the testing and restarting it again • Password facility for administrator and operator with different levels of authorization • Print out facility of test-reports with desired headers. • Facility to take back-up of data for selective dates. • Absolute measurement with higher precision / more accurate standard in fully automatic mode using BNC type socket provided on Meter Mounting Rack • Testing facility of meters with different constants • Facility to display of different output voltages and currents • Displaying the curve of test voltage and current in presence of Harmonics • Protection of meters under test from high voltage and current 7. The software shall be capable to generate special waveforms according to the IEC 62052-11 and IEC 62053-11 defined under the chapters 11, 21, 22, 23 for the different meter classes. This includes voltage dip, voltage interruptions, voltage interruption one cycle, phase fired waveform, burst control waveform, etc. 8. The software shall support display of following quantities: • Single phase active, reactive and apparent energies • Phase to Phase and Phase to neutral voltages • Phase wise currents • Phase wise Power factor and total phase Power factor • Active, reactive and apparent power phase wise and total • Phase angle between voltage and current vectors phase wise • Phase angle between the phase voltages • Mains Frequency • Content of harmonics (total and phase wise) • Phase sequence

		• Calculated error between the reference standard meters and the meter under test • Elapsed time from the beginning of the test • Number of disk revolutions or pulses from beginning of the test • Min 10-Digit Alphanumeric meter serial number (to be entered by the operator through keypad or through barcode scanner input) 9. The MTS software shall also allow operator to enter the details (rated voltage, basic current, maximum current, meter constant and the accuracy Class) of meter under test. Based on these data it shall carry out the testing operations on the meters under test on the test bench. 10. The software shall allow operator to • Create type table (data of meter type) • Test sequence (as per IS and IEC standards) • Conduct automatic testing which means generate, control, monitor the test parameter and test sequence, conduct the testing, indicate the result on PC monitor, store the result and printout the results. • **The extracted format shall be strictly in TPC defined format as defined. The defined format may be changed later depending upon business requirement.** 11. Conduct the influence quantity testing as per IS and IEC standard 12. The various test points for these tests shall be kept as database tables either based on standards or user specific. The software shall support user defined test plan and performing the testing sequentially on the selected test points according to the plan. 13. The MTS software shall be menu driven and shall include clearly understood screen windows referring to the test sequence and selection. This shall allow the user to efficiently use the capabilities and reduce data entry from the keyboard. 14. The software shall be designed for ease of learning, ease of use and high productivity. The operation of the software shall be simple and online help shall be provided at screen windows. The modular software shall facilitate the testing procedures by guiding the user to set the test bench system according to test points control of testing sequence and the testing parameters evaluation and display of meter error and their status to provide recording of testing results. 15. All components in system software shall have uniform appearance and interact instantly and seamlessly with each other in a multi-tasking software environment. 16. The desktop software shall be graphics oriented and provide for rapid and automatic processing of data in order to maximize productivity. 17. The software should be flexible in its naming conventions. **18.** The software shall offer sequential reporting, statistics analysis and printing of test results in user defined formats. **All the acceptance testing including accuracy, smart meter load switch, dial test, MD reset, etc after completion of testing will be carried out automatically without any manual intervention.** 19. The system shall also integrate with commercially available office

suites to allow producing user defined custom reports.

20. When running a report by date span, the system shall provide users with the option to enter specific start and stop dates, or to run reports using standard time scales such as today, yesterday, month to date, specific date etc.
21. All the communications shall have to be done through open protocol. The bidder shall provide all the details of protocol used for the communication as well as DLMS meter data communication at each position through the offered software.
22. The bidder shall furnish the **demonstration version** of the software along with the offer.
23. Password facility for administrator and operator with different levels
24. If bidder develops any software upgrade, or if any changes/upgrades are required in the Tata Power PC system, the bidder shall update, install and ensure compatibility of test software free of cost. Failure to provide the necessary updates and support may result in invocation of Performance Bank Guarantee (PBG) as per the contract terms.
25. The bidder shall also provide the **Software validation certification** along with the software.
26. The licensed proprietary software of the meter-testing equipment shall be supplied **through Secured cloud based download/ SharePoint.**

Testing facilities for communication command for Smart Meters:

a) Communicate with all connected Smart meters on its optical port mounted on the test Bench.

The test system shall be capable of communicating with the IS15959 /IS16444 compliant meters mounted on each position over the meter's optical port simultaneously. The system shall support communication with multiple meters of the same make as well as different makes and models, subject to compliance with same communication protocols. The necessary optical head shall be provided for each position on the test. Purchaser shall provide necessary requisite for establish communication with meter on optical port such as password, encryption details etc.

Response from each connected meter shall be received by associated test system software and reporting of each sent command along with response received from communicable meter shall be done by associated test system software.

b) Communicate with Smart meter over its GPRS/RF communication port.

The Test bench shall be integrated with GPRS/RF (Network Interface Card/gateway/DCU) for communication with all connected Smart Meters. Bidder shall provide necessary provision with test bench to integrate available RF device. The requisite shall be provided by Purchaser with necessary Protocol and API command details for RF receiver/gateway/cloud

server), hardware description such as port details and pin diagrams, logging credential for cloud/ server interface etc. or any other necessary requisite to integrate the same with test system.
Test software shall have provision for received response from each connected meter using RF communication medium. There shall be provision for compare the received output with the response received from the optical ports for each connected meter.
The facility shall be provided in the associate test software to report the sent command and response received from each energy meters.

Purchaser will provide the necessary security information for readout and writing of parameters from SMART meters.

c) Functional test

The Test system shall perform all the routine functional test as mentioned below simultaneously on all connected meters on the test bench over the communication port.

d) As per Table A30 of IS15959 Part2 and Table 29 of IS15959 Part3

Associations

The associated test system software shall have facility to check object list of the current association of all connected smart meters on meter test bench.
The test shall be conducted using each association at a time such as Public Client, MR and US (HLS) via communication port by sending OBIS code to read the object list.
The report for each association shall be generated for its accessible attributes i.e. object list using associated test system software.

Data read

The associated test system software shall have facility for selecting any five or more readouts from instantaneous parameter list table of IS15959 Part2 (Table A1 and Table A14) and IS15959 Part3 (Table 1 and Table 14). The user can select/ deselect the random parameters from the instantaneous parameters list table as per requirement of the specification using associated test system software.
The test shall be conducted using any suitable association such as MR and US (HLS) via communication port and sending OBIS code command for individual parameter read (instantaneous Voltage, PF, frequency, energy etc.).
The report for each readout shall be generated for its response from the smart meter using associated test system software.

Profile read as per Table A4 of IS15959 part 2 and as per table 4 of IS15959 part 3

The associated test system software shall have facility to readout the Billing profile parameter of all connected DLMS compliant smart meters simultaneously with the test bench.
The report for Profile read shall be generated using associated test system

		software. **Selective programmability as per Table A13 of IS15959 part 2 and as per table 13 of IS15959 part 3** The associated test system software shall have facility perform execution of any two or more parameter (except the image transfer) from list table of IS15959 Part 2 (Table A13) and IS15959 Part 3 (Table 13). The user can select/ deselect the random parameters from the list table as per requirement of the specification using associated test system software. **Connect/disconnect** The associated test system software shall have facility to readout the status of connect /disconnect state of all connected meters simultaneously with the test bench with ON & OFF load condition. The test shall be conducted using any suitable association such as MR and US (HLS) via communication port and sending OBIS code command for reading the status of load switch. The report for readout status of load switch shall be generated using associated test system software. **e) Name plate details** The associated test bench software shall communicate with the smart meter to read its name plate details as per corresponding table of IS 15959 Part2 (Table A12 and A26), IS15959 Part3 (Table 12 and Table 25). The test shall be conducted once the HDLC connection is established between client and server using any association at a time such Public Client, MR and US(HLS) via communication and sending OBIS code command for name plate details (Serial No. manufacturer year etc.). The report for response i.e. readout of nameplate details from the smart meter for each OBIS code shall be generated using associated test system software. **f) Provision for Burden measurement of the smart meter:** The test bench shall have facility to measure burden (power consumption) for **atleast 5 meter position** automatically as per clause no 6.10.1 of IS16444 (part 1and 2) using suitable methods: The power consumption in voltage circuit has to be measured in following conditions: • During idle mode of communication module • If a separate module to service a IHD is present • During data transmission per communication module. Under each of above-mentioned condition, the burden measurement in the voltage circuit shall be performed using suitable Burden measurement unit sequentially for atleast 5 meter position of test bench one by one. The Burden

		Measurement unit shall have communication with test bench software for fetching the measured results automatically. The measured results reported using associated test system software. **Bidder to provide technical details of Burden Measurement unit alongwith bid.** The Specification and feature of Burden Measurement Unit shall be as follows: • Integration of measured power and reporting & Measurement of peak power during the test. • Automatically reading through test bench associate software. • Measurement of current in voltage circuit using clamp on CT and without breaking the voltage connection. The burden measurement unit shall also be **capable to measure power consumption of current circuit of Smart Energy Meter.** **g) Verification of electrical tamper conditions.** Following Electrical Tamper conditions shall be created for its occurrence and restoration by the test bench. The created event shall be verified over the optical port and RF port for connected meters against the test conditions simulated by operator. These tests shall run in automatic mode simultaneously for all connected meters on test bench. Test shall be performed for both occurrence and restoration of corresponding tamper condition. • Current reversal • Power failure • Low power factor • And any other tamper conditions defined in IS and TPC specs The associated test bench software shall have the possibility to show the response received over different communication port such as optical and GPRS/RF on the same connected Smart meter on the test bench. **h) Stress test** Test bench shall be able to create the metrological stress conditions to all connected meters on the test bench as mentioned below: - a. 10% of 3rd harmonics in phase in current, as per IS13779/14697 b. 10% 5th harmonics in voltage and 40% of 5th harmonics in current, c. 120% of Vref, as per IS13779/14697 d. Imax applied to the meter, as per IS13779 e. 60% of Vref, f. frequency variation +10% g. frequency variation -10% h. low PF such as 0.1PF All above conditions shall be simulated by test system and the communication of the smart meter shall be verified in the influenced conditions through performing any one functional test as per above clause no. C. The associate test system software shall be having facility to report any discrepancy in the

response from meter in normal condition and stressed condition.

a. SNRM/UA as per clause 4.1 and 4.2 of IS 15959 part1
b. Security as per clause 7.5 of IS 15959 part-1
c. Block load profile parameters table A2 of IS 15959 part 2 and table 2 of IS15959 part -3
d. Selective access by range of Block load profile parameters as per clause 11.3 of IS 15959 part-1
e. Daily load profile parameters s per table A3 of IS 15959 part 2 and table 3 of IS15959 part -3
f. Selective access by range of Daily load profile parameters as per clause 11.3 of IS 15959 part-1
g. ToU setting as per clause 9 of IS 15959 part-1
h. Billing period and billing period counter as per clause 10.1 and 10.2 of IS 15959 part-1
i. Selective access by Entry for billing load profile as per clause 11.3 of IS 15959 part-1
j. Events and event log profile other than mentioned in functional test as per clause 8.1, 8.2 of IS 15959 part-1, table A-11 of IS15959 part -2 and table 11 of IS 15959 part-3
k. Selective access by entry for event log profile as per clause 11.3 of IS 15959 part 1

i) Automatic testing of Communication:

The associated test bench system software shall communicate with all connected meters mounted on the test bench either as a single communication command OR combination of several communication commands included in one test sequence i.e. for meter read out and generation/simulation of the tamper conditions/ stress conditions by the test bench. The testing can be carried out in automatic mode to test the communication correctness on communication ports between all connected smart meters and the test bench.

j) Integration of Available meters:

Bidder shall demonstrate the above-mentioned testing for minimum 3 different make of meters together available with Purchaser. Along with sample meters, the requisite shall be provided by Purchaser with necessary password, encryption details, Protocol and API command details for GPRS/RF receiver/gateway/cloud server), hardware description such as port details and pin diagrams, logging credential for cloud/ server interface etc. or any other necessary requisite to integrate the same with test system.

Bidder noted that, in case Bidder shall not able to demonstrate the desired functionality during evaluation the bid of aforesaid bidder shall not be considered.

		Testing functions for Smart Meters as per Amendment **Communicate with Smart meter through API of HES (test server)** The Test bench shall be integrated with API to communicate test server for end-to-end testing of all connected smart meters simultaneously. Test software shall have provision for receive response from each connected smart meter using API of HES test server. All alerts generation and OTA operation shall also be performed using test bench software after API integration. The facility shall be provided in the associate test software to report the sent command and response received from each energy meters without any extra cost. **Checking and comparing RTC of smart meters.** The test bench software shall be capable to read RTC of all connected meters and able to find out the drift. If the drift shall be more than permissible limits of the Standards / Utility specifications, the software shall do evaluation of results and declare Fail or Pass. **The reporting of RTC drift shall be done using test bench associate software.** The test bench software also shall be capable to set the RTC of connected smart energy meters. **Verification of display by comparing RTC of smart meters.** The test bench software shall be capable read out with Display of connected smart energy meters. The software shall have facility to enter the visible display readings. The reporting of comparison of display values shall be done using test bench associate software. **Verification of Security.** The test bench software shall be capable change LLS password and again meter can be accessible with the new set password. Necessary selective readouts as mentioned in technical specification shall be read after changing of password (i.e. with new password). The reporting of this functionality shall be done using test bench associate software. **Load limit verification.** The test bench software shall be capable to verify the load Limit of smart meters. The test bench software shall read the load limit defined at energy meter. After that Test bench shall set to the necessary load so that meter shall detect load limit condition and cutoff stage shall be occurred. The reporting of this functionality shall be done using test bench associate software. **First Breath and Last Gasp verification.** The test bench software shall be capable to verify First Breath and last gasp functionality of smart meters. The test bench software shall create the necessary condition on connected energy meters and verify the First breath

		and last gasp functionality. The reporting of this functionality shall be done using test bench associate software.
10.	**CALIBRATION AND TESTING**	The equipment shall be supplied along with the manufacturer's test certificate/s of the individual components of the meter-testing system such as Source, Voltage and Current Amplifiers, ERSS, Meter-Mounting Rack, Scanning-heads, Digital Process Unit, and the complete meter- testing system. Additionally, calibration certificate of the ERSS, ICTs & MSVT for the entire range of power/energy/voltage/current/PF/frequency/THD-Active/Reactive measurement valid for at least 12 months from the date of calibration. The calibration certificate of the ERSS, ICTs & MSVT shall be issued by nationally accredited laboratory. The test bench shall be supplied with calibration of source from nationally ISO 17025 accredited laboratory. Sample load points of ERSS, MSVT,ICT & Source will be mutually decided during order placement. **Yearly on-site calibration covering complete electrical measurement range shall be carried out by bidder through NABL-accredited laboratory for another 9 years, i.e., from the 2nd year to the 10th year after commissioning of test benches.** **If any drift or deviation is observed during calibration, bidder shall rectify the same and perform necessary re-calibration at no additional cost to the purchaser**.
11.	**NAME PLATE AND MARKING**	All the components and Operating Devices of the test bench shall be provided with durable MARKING and legible nameplates containing all technical parameters. Name shall be embossed with **"PO No. with date, "Property of TATA POWER, MUMBAI DISTRIBUTION", along with Manufacturer's Name and Manufacturing year**
12.	**TESTS**	All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine & type tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Calibration certificate of the Reference Standard which will be supplied should have calibration certificate valid for a period of one year. This calibration should be done from laboratory accredited as per ISO/I EC 17025.

		Name of the laboratory shall be given in the bid.
13.	**TYPE TEST CERTIFICATE**	Bidder must submit type test certificate of similar model fully automatic test system as per IS 12346. Type test should have been conducted in certified Test Laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to Tata Power or else the bid will not be accepted.
14.	**ROUTINE/ACCEPTANCE TEST**	The following checks are to be carried out for Fully- automatic Meter Testing Bench as per Appendix B {Clause 8) of IS 12346 detailed as under as applicable for fully -automatic test benches: 1. Mechanical construction. 2. Wiring and connections specially those of parts which can be moved. 3. Stated accuracy of all measuring instruments. 4. Di-electric properties. 5. Phase Sequence. 6. Voltage Circuit Control. 7. Measuring range verification. 8. Voltage adjusting facility, regulating capacity at various loads. 9. Voltage balance adjustment facility. 10. Verification of VA burden of voltage circuit. 11. Verification of VA burden of current circuit. 12. Current Circuit control. 13. Measuring range verification. 14. Current circuit regulating facility and verification of capacity on various loads. 15. Measuring circuits. 16. Accuracy of display of various parameters like, current, voltage, P.F., phase angle etc. of measuring range, measuring methods, checking of phase displacement (lagging-leading). 17. Accuracy of measurement of energy by connecting High precision reference meter with it. 18. Distortion factor Control 19. Input terminals of meter testing bench.

		20. Output terminals of Meter Testing Bench. 21. Software operated controls for measurements of voltage & current circuits & other parameters. 22. Verification of various output reports.
15.	**DEMONSTRATION**	The Bidder shall arrange physical demonstration of exactly the same tendered functionality of test bench within 15 days from the date of closing of tender during technical evaluation at Bidder's cost. If bidder fail to arrange the same, bid shall not be consider for further evaluation.
16.	**PRE-DISPATCH INSPECTION (FAT)**	Equipment shall be subject to inspection by a duly authorized representative of the TATA POWER. Bidder shall grant free access to the places of manufacture to Tata Power's representatives at all times when the work is in progress. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by Tata Power. Following documents shall be sent along with material a) Test reports b) MDCC issued by Tata Power c) lnvoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee Warrantee card g) Delivery Challan h) Other Documents (as applicable) The bidder shall be responsible for arranging and bearing all costs associated with the visit, including travel from the Tata Power office location to bidder's factory, local conveyance, lodging, boarding and any other required arrangements for minimum 2 personnel.

17.	**INSPECTION AFTER RECEIPT AT STORE**	The material received at TATA POWER store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Corporate Contracts team.
18.	**PACKING**	Bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport (local equipment) and be packed in such a manner as to protect it from damage in transit. The material used for packing shall be environmentally friendly. The bidder shall bear full responsibility for safety and integrity of equipment until its successful installation and commissioning at designated location. Any damage, loss or shortage occurring till successful installation and commissioning shall be rectified or replaced by the bidder at no additional cost to purchaser.
19.	**DRAWING AND DOCUMENTATION**	One set of following documents shall be supplied along with each test system based on Tata Power specification. • Completely filled in Technical Parameters • Operating manual of each component of test equipment like reference standard, amplifier, etc. • Wiring diagram Power Source Cabinet with power source installation, Meter mounting rack, Fixing arrangement of MSVT & ICT, Voltage and current circuit connection diagrams, Fixing arrangement for scanner head and error calculation unit. • An outline general arrangement drawing showing plan, front and rear view of the Test system plan of the Meter Test Equipment with principal dimensions. • Details of cables accessories. • Drawing showing constructional details and dimensions. • Service manuals. It should include troubleshooting & remedies for minor problems of Meter Test Equipment. • Separate testing software manual describing step by step testing procedures with help of screen snap shots shall be given at the time of delivery. • Calibration certificate of reference standard, ICT, MSVT from National/International ISO 17025:2017 laboratory. • Test certificate of complete test system including individual components • Type test certificate • Experience list • Manufacturing schedule and test schedule • All manuals in hard copy as well in soft copy through %Secured clouse based download/Sharepoint. • All the documents & drawings shall be in English language only.

20.	**INSTALLATION AND COMMISSIOING**	The Bidder shall be responsible to install & commission the meter test equipment at the purchaser location(It may be above ground level). The supplier shall submit the layout plan, installation proposal and electric supply requirements within 2 weeks after receiving the purchase order. The Purchaser shall arrange the appropriate room, location, electric supply etc. as defined in IEC 62052-11 before the supply of the system so as to permit the smooth and proper installation of the system immediately upon its delivery to the designated location/s. Do's and Don'ts shall be provided by bidder regarding operation and testing. **A refresher course shall also be arranged by the supplier during the Guarantee period once in a year at laboratory**.
21.	**TRAINING**	The Bidder shall provide training on operation, maintenance and trouble shooting of the meter test equipment and testing software to atleast 5 engineers of Tata Power for minimum 6 days. (Excluding the period of Installation and commissioning) . All expenses for providing such training support shall be borne by the vendor and shall ensure to provide full support whenever required in future.
22.	**TECHNICAL SUPPORT**	Bidder shall have trained engineers based in India who can attend to trouble shooting at the shortest notice period within 2 days, during guarantee period and further also. In support of this, bidder have to submit List of Employees, List of Plant and Machinery, tools and tackles to carry out service and purchase order copy of Running Annual Maintenance Contract (AMC) of 5 Nos. of similar or better Energy Meter test benches from govt. power utilities/govt. NABL laboratories under qualifying requirement.
23.	**Warranty**	Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a **period of at least 120 months from the date of commissioning or 126 months from the date of last supplies** made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the bidder or from the " Security cum Performance Deposit" as the case may be. **A comprehensive warranty is expected to cover all components of the meter test system, including the Reference Standard Meter (RSM), Source, Voltage Amplifier, Current Amplifier, ICT, MSVT, Scanning Heads, Digital System, Error Calculation Units, Meter Mounting Rack and all associated mechanical parts. The warranty shall also cover any damage caused due to rodent infestation, including damage to cables, wiring, connectors, insulation and other system components, the bidder shall be responsible for repairing or replacing such affected parts during the warranty period at no additional cost to Tata Power.** **The bidder shall send their representative twice in a year for preventive maintenance of the test benches.**

		Bidder shall further be responsible for 'free replacement at site' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the purchaser. During guarantee period if any part/ component need to be sent out of India for repairs or for any other reason then all freight, clearances & allied expenses for sending this part/ component shall be borne by supplier. The manufacturer shall give assurance to supply spares of Fully Automatic Test Bench for 20 years from supply. **Undertaking to be submitted along with Bid.**
24.	**3D BLUETOOTH QR/BARCODE SCANNER**	Good brand **3D BLUETOOTH QR/BARCODE SCANNER** with rechargeable battery to be provided with each test system free of cost with alteast 5 years of warranty.
25.	**MINIMUM TESTING FACILTY**	Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards/TPC specification. The bidder shall have duly calibrated Reference Standard meter of Class 0.01 accuracy or better.
26.	**MANUFACTURING ACTIVITIES**	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
27.	**QUALITY CONTROL**	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. • The bidder shall invariably furnish following information along with his bid, failing which his bid shall be liable for rejection. Information shall be separately given for individual type of equipment offered. a) Statement giving list of important raw materials, names of sub-suppliers for the b) raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in the presence of bidder's representative, copies of test certificates. c) Information and copies of test certificates as in (I) above in respect of bought out accessories. d) List of manufacturing facilities available. e) Level of automation achieved and list of areas where manual processing exists. f) List of areas in manufacturing process, where stage inspections are

		normally carried out for quality control and details of such test and inspection. g) List of testing equipment available with the bidder for final testing of equipment along with valid calibration reports shall be furnished with the bid. Manufacturer shall posses 0.1 class instruments for measurement of losses. h) Quality Assurance Plan (QAP) with hold points for Purchaser's inspection as per annexure. • The successful bidder shall within 30 days of placement of order, submit following information to the Purchaser. a. List of raw materials as well as bought out accessories and the names of sub-suppliers selected from those furnished along with offer. b. Type test certificates of the raw materials and bought out accessories. • The successful bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing.
28.	**SERVICE SUPPORT AND SERVICE LEVEL AGREEMENT**	• During guarantee period, the bidder shall arrange minimum 2 nos. regular service visits in a year. The visits shall be planned on mutually convenient dates with TATA Power officers, without any extra charges. • Beside the 2 nos. scheduled service visits, as and when required, the bidder shall arrange unforeseen/unscheduled visit without any extra charges during breakdown of test bench in a year for resolution of the breakdown. • Additionally, the bidder shall provide the tele and video call support as and when required for any software and hardware related minor issues or upgradation which can be handled by Tata Power officers. • Any breakdown of test bench shall be attended by bidder representative within 48 hours for resolution of the problem. • During troubleshooting of test bench by your representative while his visit, if any component / equipment is found defective and required to be replaced / repaired (component / equipment which cannot be repaired at site) within the above guaranteed period shall be replaced / repaired by the supplier free of cost within 15 working days of receipt of intimation. • Failure to adhere to this timeline attracts a penalty of Rs. 2000/- per day per instance which will be recovered from the outstanding bills payable/ Performance bank guarantee/ retention money. • If the defective equipment / components are not replaced / repaired within 3 months from the date of intimation, Tata Power shall have the rights to forfeit the retention money / Performance Bank Guarantee provided / applicable for this PO. • The replaced/repaired equipment / components shall have a guarantee period of six months from the date of replacement / repair or the remaining period of guarantee, whichever is later. • The bidder shall ensure availability of spare parts and Service support for the offered test bench set up / equipment and its accessories for a minimum period of 5 years after completion of Guarantee period. • The bidder shall give at-least 12 months advance notice to Tata Power before

<table>
<tr><td></td><td></td><td>phasing out the model of supplied test bench set-up / individual equipment and/or accessories from its manufacturing range. This will enable Tata Power to plan for placement of order for any spares etc. In the event of bidder phasing out or discontinuing the set up and its accessories without intimation, the bidder would be liable to bear the consequential cost of replacement of that equipment which could not be re-used due to unavailability of spares/service from the bidder.
• The Supplier shall extend necessary support to Tata Power in the event of shifting of the equipment to any other premises/ location of Tata Power business units. This can be treated as additional services on chargeable basis.
• The bidder shall recommend the list of spares and quantity of spares to be kept by the purchaser for uninterrupted services of the Test bench System.</td></tr>
<tr><td>29.</td><td>GTP (GARANTEED TECHNICAL PARTICULARS)</td><td>Completely clause wise compliance to be submitted for Manufacturing clearance.</td></tr>
<tr><td>30.</td><td>SCHEDULE OF DEVIATIONS</td><td><u>(TO BE ENCLOSED WITH THE BID)</u>

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

<table>
<tr><th>S.No.</th><th>Clause No.</th><th>Details of deviation with justifications</th></tr>
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We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation</td></tr>
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TECHNICAL SPECIFICTAION
For
Fully Automatic Twenty (20) Position Smart Meter Test Bench
for
Three Phase Smart and Conventional Meters

Document No.	TPC\MTL\TESTBENCH\2026\02	Issue No.	01
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	Himali Patel	**Rahul Ranadive**	**B Karunakaran**

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30.0 SCHEDULE OF DEVIATIONS

1.0	**INTRODUCTION**	This Specification covers the technical requirements of design, engineering, manufacturing, testing at manufacturer's works, packing, forwarding, Supply, installation and commissioning of the system of 20 position Three Phase fully Automatic Electronic, Computer Controlled Smart Meter test bench with 20 optical heads, with 0.02 Class suitable for simultaneous testing of either electromechanical & electronic, whole current or CT operated type smart energy meters in the laboratory of utility. Tata Power would like to invite offers from qualified suppliers having a strong development and state-of-the art production facilities and an extensive experience in supply, installation and commissioning and after sales services of energy meter test equipment's. The supplier to be selected for this tender shall have the requisite hands-on experience of supplying similar kind of test equipment in India or comparable emerging countries.
2.0	**PRE QUALIFICATION REQUIREMENT:**	The offer of those tenderers, who fulfill following criteria, shall only be considered: 1) The bidder shall be original equipment manufacturer /Indian Partner having ISO 9001 certification and ISO/IEC 17025:2017 Accreditation facility and has at least 10 years of experience in design / manufacturing and supplying, installation, testing, commissioning and maintenance for similar or better meter test equipment in India. Certificate of ISO 9001 & ISO/IEC 17025:2017 shall be submitted along with bid. Any association with any Laboratory will not be considered. 2) The bidder must have supplied at-least 03 nos. meter test system of similar specifications and the same are in operation successfully in India for more than 2 years at a NABL Accredited Laboratory/ Meter Manufacturer/ DISCOMs as on bidding date. Necessary purchase order copies shall be submitted along with the bid. 3) Bidder shall submit at least 3 performance certificates showing satisfactory operation for more than 02 year from NABL accredited laboratory / Utilities / Govt. Dept. of India / Any reputed organization. The work against these issued certificates should be completed in last five years from the date of bid submission. In case the bidder has a previous association with Tata Power for similar products and services, the performance feedback for that bidder by Tata Power's User Group, shall only be considered irrespective of performance certificates issued by any third organization. (Please note that Performance Certificate should not be older than 5 years form due date of submission of bids). Technical performance, delivery timelines, service and support records of past executed projects in Tata Power will be considered for technical evaluation of bidder. The bidder shall submit a list of important customers served, with documentary evidence along with the offer. Purchaser has right to directly contact concerned laboratory regarding performance of the Meter test benches. 4) The average annual turnover of bidder of last three (3) financial years should be at least Rs. 10 Crores. Bidder shall submit notarized audited

		financial reports for the last 3 financial years in support of proving the financial standing of the bidder. 5) The bid shall be submitted by the manufacturer or their sole authorized representative duly supported by certificate of authorization.
3.0	**SCOPE OF SUPPLY**	This specification covers single point responsibility turnkey contract including design, engineering, manufacturing, testing, packing, transportation, delivery, installation and successful commissioning of fully automatic high precision computer controlled 20 position three phase stationary meter test system (referred hereafter as "MTS") for testing 1P2W, 3P3W, 3P4W Whole Current, CT-PT Operated energy meters, putting into operation and establishing the successful performance during the performance guarantee including all other incidental services required for the satisfactory performance of the system as per international codes and standards. The supply shall consist of a) Power source Unit b) Reference Standard Meter c) Scanning Heads d) ICT (Isolation Current Transformer) e) Meter Test bench suspension Rack with quick connecting system f) Meter communication system g) Software h) Individual Error Indication & Evaluation System In addition to above, the scope of supply shall also include the following: a) Copy of software in Secured cloud-based download in English Language for operation of the equipment b) All accessories including voltage cables, current cables, scanner head etc. c) Operational and maintenance manuals including drawings d) Training to at least five people on all aspects of operation and maintenance of the equipment at Laboratory

e) List of spares and consumables

f) Continued technical support

The scope does not include the computer hardware and printer; however, the bidder shall suggest the specifications of the same along with the technical offers.

Tolerances on all the dimensions shall be in accordance with provisions made in the relevant IEC/Indian standards and these technical specifications. Otherwise, the same will be governed by good engineering practices in existence.

It is not the intent to specify completely herein all the details of the design and construction of material. However, the product shall conform in all respects to high standards of engineering, design and workmanship and shall be performing in continuous commercial operation in a manner acceptable to the purchaser.

The offered material shall be complete with all components necessary for their intended purpose. The design, manufacture and performance of equipment shall comply with all currently applicable standards, regulations, and safety codes in the locality where the equipment will be installed. Nothing in this specification shall be construed to relieve vendor of this responsibility.

- **Suitable Online UPS with minimum one-hour battery backup,** adequately rated to meet the test bench load requirements, shall be supplied by bidder along with each Meter Test System (MTS).
- **The selected bidder shall buyback Tata Power's existing old meter test benches against the new supply.** (2 nos. 16 position meter test benches, Songyang make, 0.02 class). Benches to be picked up from Matunga Lab, Mumbai at bidder's cost.
- **Yearly on-site calibration** covering complete electrical measurement range shall be carried out by bidder through NABL-accredited laboratory for another 9 years, i.e., from the 2nd year to the 10th year after commissioning of test benches. (Load points will be covered as per entire range of all electrical parameters)

  If any drift or deviation is observed during calibration, bidder shall rectify the same and perform necessary re-calibration at no additional cost to the purchaser.
- Tata Power is in the process of developing new laboratory infrastructure where these test benches will be installed. In the event that infrastructure is not ready at the time of equipment supply, **the bidder shall still remain responsible for ensuring successful installation, commissioning and performance testing of entire Meter Test System.** Any delay or extended gap between the supply and installation of equipment shall not relieve the bidder of these obligations, and the bidder shall provide all necessary support to ensure successful completion of the project.
- Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for

		due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser **up to a period of at least 120 months from the date of commissioning or 126 months from the date of last supplies made under the contract whichever is earlier.** **Mandatory Technical Requirement:** 1) All components like Source, Reference Standard Meter, Error evaluation & digital system, Isolation Current Transformer, MSVT, Scanning Head, Aluminum Test Rack of Meter Test System should be **only from one manufacturer** to provide better integrity and after sales of offered product 2) The Bidder should declare that he is not been ever black listed /defaulter by any utility/ DISCOMs/Distribution Company/ Laboratories/ Any department of State Government or Centre Government on record of poor performance such as not properly completing the contract, inordinate delays in supply completion, not supplying the items as per commitment of contract etc. 3) The Bidder should have its own fully equipped service center and trained engineers dedicated for trouble shooting and technical support permanently posted in India. The bidder shall enclosed necessary proof that he has necessary facility to adjust and calibrate the offered measuring unit within the country. **List of Plant and Machinery, tools and tackles** to carry out service shall be submitted along with offer. Bidder shall have to submit **purchase order copies of Annual Maintenance Contract (AMC)** of at least five no. of fully automatic meter test benches. 4) Major components used in the test bench like voltage and current amplifier, reference standard meter, all other accessories shall confirm to safety requirement i.e. having CE mark. **LOCATION:** The meter test system shall be installed and commissioned at the locations specified as below- The Tata Power Company Limited, Dharavi Receiving Station, Near Shalimar Industrial Estate, Matunga, Mumbai 400 019, Maharashtra Tata Power reserves the right to change installation location of the equipment based on business requirements. The same shall be initiated to vendor in advance and vendor shall provide necessary support for successful installation and commissioning at revised location.

4.0 APPLICABLE STANDARDS

The equipment covered by this specification shall conform to the requirements stated in latest editions of relevant Indian/ IEC Standards and shall conform to the regulations of local statutory authorities.

Purpose	Applicable
Meter Testing	IS12346:1999
Smart Energy meters and Static Energy Meters	IS14697, IS13779, IEC 62052-11, 62053-11, 21, 22, 23, IS16444 (Part 1 & 2). IS15959 (Part 1, 2, & 3)
Safety	IEC 61010
Meter Testing Equipment	IEC 62057-1, IS 12346, IS15707

All standards latest amendments also shall be applicable.

5.0	**GENERAL TECHNICAL REQUIREMENTS**	
5.1	**APPLICATION**	To provide facilities for carrying out routine, acceptance and certification test on all types of electronic single phase meter & Portable Reference meters in Active, Reactive & Apparent Mode.
5.2	**OPERATING CONDITIONS**	The meter test equipment shall be suitable for giving an uninterrupted service in following conditions: a. Ambient temperature (-) 10°C to (+) 45°C for operation and from (-) 10°C to (+) 60°C for storage. b. Relative humidity up to 95%. c. Mains voltage shall be 3x240V ± 10% d. Frequency 50Hz ± 5 %. e. Cabinet for source must be dust proof. The bidder shall furnish the details of environmental parameters which are to be maintained with the list of equipment to control the same.
5.3	**TEST TO BE PERFORMED**	The offered meter test system shall be capable to perform the following tests on the meters as per IEC 62052-11, 62053-11, 21, 22, 23, IS16444 (Part 1 & 2), IS15959 (Part 1, 2, & 3) IS14697 and IS13779 using frequency output /LED pulse output method. a) Simultaneous calibration/ testing of ERS Meter b) Pre-warming c) Accuracy test as per IS/IEC d) Starting current test e) Creep test (No load Test) f) Dial test g) Connect/Disconnect testing of Load switch during ON & OFF Load condition for all meters simultaneously and its auto reporting for WC meters h) Influence quantity test related to accuracy test • Voltage Variation, Frequency Variation • Influence of Harmonic component in voltage and current circuit, odd and sub harmonic, DC and Even Harmonics and Voltage dip (50% of Vref) and interruption test (20ms). • Facility to simulate neutral current in system i) Testing of communicable Smart meters • **Communicate with Smart meter on its Optical Port.** • **Communicate with Smart meter on its GPRS/RF communication port** • Verification of Smart meter functionality for Routine test. • Automatic Burden measurement(Power measurement of voltage and current circuit) of the smart meter for minimum 5 meter position • Verification of electrical tamper conditions. • Stress test. • Automated testing of End to End (API/HES) Communication Test. • Any other tests as per relevant IS/IEC Standards • **Programming verification** as per IS requirement • **Facility to test all types of single phase/three phase conventional/smart/pre-paid**

		In addition, the offered meter-testing system shall be capable to perform the following tests on RSS and ERSS under testing using frequency output of built-in ERSS. j) Accuracy testing of reference standard used into test system against high precision reference standard k) Accuracy testing of reference standard (low accuracy) against the built-in reference standard. l) The system offered shall be capable for testing/calibration of ABT panel mounted meters. Required cables set shall be provided with the test bench. m) The offered system shall be capable for testing/calibration of LTCT operated meters without using ICTs (isolation current transformers). Required cables shall be provided along with the test bench. n) The MTS shall be suitable for testing and calibration of single phase as well as three phase meters with closed voltage & current link.

6.0	**GENERAL CONSTRUCTIONS**	
6.1	**CONSTRUCTION AND COMPONENT OF SYSTEM**	The complete system shall consist of at least the following essential components, specifications of which are defined hereinafter in this document. 1. Cabinet to house power source and RSS 2. Static Power Supply Unit 3. High Precision Reference standard meter 4. Meter mounting Rack with Quick Connecting system 5. Scanning heads 6. Individual Error calculators and indication system 7. Optical/ RS232 Communication system with each MUT (meter under test) 8. Isolating current transformers 9. Windows based Software to operate the system The source shall be easily programmable so as to give: a) Reference output frequency independent of mains, with quartz-controlled operation range from 40 Hz. to 70 Hz. in steps of 0.01 Hz. with high efficiency, power-factor compensation according to IEC 60555. b) Stability at inductive, capacitive and non-linear loads for the power factor. c) Protection against overload and short circuit and provision for superimposition of harmonics in the range of 2nd to 40th harmonics. Power Factor compensation shall be provided as per IEC 60555 so that the meter-testing system shall draw purely sinusoidal current from the mains A.C. supply without polluting it. All the material and electronic Energy components used in the manufacture of the meter test system shall be of highest quality and reputed make to ensure higher reliability and longer life and trouble-free operation. The equipment should be compact and reliable in design, rugged for rough handling during commercial use. It shall be able to sustain its metrological properties under the operation in tropical environment. All insulating material used in the construction of the equipment shall be non-hygroscopic, non-aging and of tested quality. All parts, which are subject to corrosion under normal working conditions, shall be protected effectively. Any protective coating shall not be liable to damage by ordinary handling or damage due to exposure to air, under normal working conditions. In the event that any corrosion, deterioration or failure of protective coating is observed during guarantee period, the bidder/OEM shall replace affected parts at no additional cost to purchaser. The meter test system shall be designed and constructed in such a way as to avoid

		introducing any danger in use and under normal conditions so as to ensure specially: • Personnel safety against electric shock - Suitable measures like **safety covers** (i.e. transparent acrylic sheet) on each quick connector and auto cut **air curtain** (With Enable/Disable facility) system shall be provided to ensure safety of testing personnel during the operation. • Personnel safety against effects of excessive temperature. • Protection against spread of fire • Protection against penetration of solid objects, dust and water. All major components used in the test bench like voltage and current amplifiers, reference standard meter, all control switch gears & scanning head device etc shall have compliance to applicable IEC/IS standard.
6.2	**CABINET**	The cabinet housing the power source and Reference Standard Meter (RSM), including all associated components and accessories, shall preferably be of 19" standard rack-mounted type or an equivalent suitable design. 1. The cabinet shall be designed to accommodate the power source, Reference Standard Meter and all associated components in an organized and accessible manner. 2. The cabinet shall be provided with suitable doors to facilitate easy opening and closing for inspection, maintenance and servicing. The doors shall be lockable to restrict access to authorized personnel only. 3. In case of a closed-type cabinet, suitable cooling fans or an equivalent cooling arrangement of adequate capacity shall be provided to maintain the internal temperature within the specified operating limits of the installed equipment during normal operation. 4. With the doors closed, the cabinet shall provide a minimum degree of protection of IP31 or better. 5. The cabinet shall be provided with suitable protective earth terminals. Proper earthing of the cabinet shall be ensured during site installation and commissioning. 6. The cabinet shall have one mains-switch to switch off the incoming power supply. **7. The cabinet shall be installed below the meter test rack to optimize floor space utilization and ensure an ergonomic and compact arrangement of the complete test bench system. RSM(Reference Standard Meter) shall be kept on top side within cabinet for ease in reading the parameters.** 8. The cabinet shall have a dust-resistant and neatly organized internal wiring arrangement. All cables and wires shall be properly routed, secured and concealed within the cabinet or through suitable cable ducts/trunking. The design shall ensure adequate protection against mechanical damage

		and prevent rodent ingress. **No loose or exposed wiring shall be visible outside the cabinet when its doors are closed.** 9. The cabinet design shall facilitate easy access for maintenance while ensuring adequate ventilation, cable management, electrical safety and protection against dust ingress. **The manufacturer shall ensure that heat generated by the power source and other installed components does not adversely affect the accuracy, stability or operating performance of the Reference Standard Meter.**
6.3	**SPECIFICATION OF STATIC POWER SOURCE**	The static Power Source Unit, shall fully be computer controlled, designed as a standard cabinet of modular structure including voltage and current amplifier units, signal generator unit for generation of phase angle & frequency and super imposition of harmonics with all the necessary controlling, indicating & display features. The output power of the power source shall be suitable for direct connection to the meters without removing the potential link in the voltage coil circuit of the meters. The accuracy of the system should remain unaffected even when the power source is directly connected to unregulated mains. The static power source unit shall have a high Precision, wide range Single phase electronic reference Standard meter with auto ranging facility, directly connected (without any use of CT /PT) to the test circuit. The static power source unit should have auto-range selection facility and serial communication port (s) for communicating with PC and the meter under test. The power source shall have adequate over-current and short circuit protection. The source shall be able to generate voltage interruption and voltage dips as specified in IS 13779, IS 14697 and CBIP 325. The source shall be easily programmable so as to give: • Reference output frequency independent of mains, with quartz-controlled operation range from 45 Hz to 65 Hz or better range in steps of 0.01 Hz with high efficiency, power-factor compensation according to IEC 60555. • Stability at inductive, capacitive and non-linear loads for the power factor. • Protection against overload and short circuit and provision for superimposition of single and multiple harmonics up to 40% of fundamental waveform over the range of 2nd to 40th harmonics in steps of 1% or better. Facility to control phase angle of harmonics shall be provided. • Star system (phase angle 120°) • Any asymmetrical system • Computer controlled adjustment of star system (120°) or asymmetrical system in steps of 0.01° • Any non-balanced system

<table>
<tr><td></td><td></td><td>Power Factor compensation shall be provided as per IEC 60555 so that the meter testing system shall draw purely sinusoidal current from the mains A.C. supply without polluting it.</td></tr>
<tr><td>6.4</td><td>SPECIFICATION OF VOLTAGE AMPLIFIER</td><td>The voltage amplifier used in the Source shall be a digital resonant switch mode voltage amplifier. It should have closed control conception of the frequency generator for high stability and high precision of test voltage. It should have output VA burden rating not less than 1000 VA. The electronic voltage amplifier shall be computer controlled and should allow step less & continuous adjustment of output voltage for testing of meters.
The voltage amplifier should have following capabilities and features:

<table>
<tr><th>S. No.</th><th>DESCPRITION</th><th>MEASURMENT</th></tr>
<tr><td>1.</td><td colspan="2">Electronic protection against Overload and Short Circuit.</td></tr>
<tr><td>2.</td><td colspan="2">LED indication for faults like overload, short circuit and power supply failure shall be provided.</td></tr>
<tr><td>3.</td><td>Output voltage range</td><td>30 -480 V (Phase-Neutral)</td></tr>
<tr><td>4.</td><td>Output VA burden rating</td><td>Not less than 1000VA/phase</td></tr>
<tr><td>5.</td><td>Efficiency</td><td>Better than 85%.</td></tr>
<tr><td>6.</td><td>Stability</td><td>100 ppm / h, or better with integration time of 60 seconds</td></tr>
<tr><td>7.</td><td>Distortion factor</td><td>< 0.5 %.</td></tr>
<tr><td>8.</td><td>Provision for super-imposing of harmonics</td><td>2nd to 40th harmonics</td></tr>
<tr><td>9.</td><td>Maximum possible DC content</td><td>< 0.05 %</td></tr>
<tr><td>10.</td><td>Accuracy of the test setting amplitude</td><td>0.05 % or better</td></tr>
<tr><td>11.</td><td>Accuracy of the test setting phase adjustment</td><td>0.01° or better.</td></tr>
</table>
</td></tr>
<tr><td>6.5</td><td>SPECIFICATION OF CURRENT AMPLIFIER</td><td>The current amplifiers used in the Source shall be digital resonant switch mode type amplifiers. It should be closed control conception of the frequency generator for high stability and high precision of test current. It should have output VA burden rating not less than 1500 VA per phase. The electronic current amplifier shall be computer controlled and should allow step less & continuous adjustment of output current for testing of meters.
The current amplifiers should have following capabilities and features:

<table>
<tr><th>S. No.</th><th>DESCPRITION</th><th>MEASURMENT</th></tr>
<tr><td>1.</td><td colspan="2">Electronic protection against open circuit and over load.</td></tr>
<tr><td>2.</td><td colspan="2">LED indication for faults like overload, open circuit and power</td></tr>
</table>
</td></tr>
</table>

			supply failure shall be provided.	
		3.	Output Current range	1 mA to 120 A
		4.	Output VA burden rating	Not less than 1500VA/phase
		5.	Efficiency	Better than 85%.
		6.	Stability	100 ppm / h with integration time of 60 sec
		7.	Distortion factor	0.5 %
		8.	Provision for super-imposing of harmonics	2nd to 40th harmonics
		9.	Maximum possible DC content	< 0.05 %
		10.	Accuracy of the test setting amplitude	0.05 % or better
		11.	Accuracy of the test setting phase adjustment	0.01°
6.6	**SIGNAL GENERATOR (FREQUENCY / PHASE ANGLE)**	The signal generator shall be digitally controlled to give output frequency independent of mains supply with provision to vary the output frequencies from 45 Hz to 65 Hz or better range in steps of 0.01 Hz. The output power factor adjustment shall be computer controlled and shall allow step less & continuous adjustment of power factor from 0.0 to 1.0 in all four quadrants in the steps of 0.01 or better, without affecting the test voltage or test current. Quick selection of any power factor shall be available / possible through meter testing software.		
6.7	**SPECIFICATION OF ELECTRONIC REFERENCE STANDARD METER (RSM)**	The class of accuracy of reference standard shall be 0.02% or better for active and reactive ranges, over the entire measurement load range & independent of the measuring mode. Current range of reference standard shall be 1 mA... 120 A direct connected and voltage range from 10-500 V (phase - neutral), selectable through PC. The offered reference meter can be interchangeable with same make of tests system. Reference standard shall have auto-range selection facility and facility of dial test (power dosing) and RS 232 serial communication port for communicating with PC. It must frequency output proportional to the power to calibrate against better standard.		

S. No.	DESCPRITION	MEASURMENT
1.	The class of accuracy of reference standard should be 0.02 or better	0.02 or better
2.	Measuring modes	• 3 wire active / reactive mode • 3 wire apparent • 2 / 4 wire active / reactive mode • 2 / 4 wire apparent
3.	Frequency Range	Basic frequency 40-70 Hz and total detectable frequency range 0…3000 Hz
4.	Voltage Range	10-500V (phase - neutral)
5.	Current Ranges	▪ 1 mA to 120 Amps. (working range) ▪ 10 mA to 120 Amps. (measurement range)
6.	Accuracy – Power / Energy (For active and reactive measurement)	0.02 % for Active/Reactive/Apparent measurement: E ≤ ± 0.02% at Cos =Sin ϕ >= 0.5 For measurement range (I >10mA-120A) ; 10-500V ; 0.02%/PF at Cos ϕ =Sin ϕ <0.5 E ≤ ± 0.04% at Cos ϕ = Sin ϕ >= 0.5 For measurement ranges (I>1mA-10mA) ;10-500V 0.04%/PF at Cos ϕ =Sin <0.50
7.	Voltage Accuracy	0.01 % for the range of 10 V to 500 V (P-N)
8.	Current Accuracy	0.01 % (10 mA to 120 A) 0.02 % (1 mA to <10 mA)
9.	Phase Angle Accuracy	< 0.01°
10.	Voltage, Current & Power measurement drift	equal to or better than 100PPM / year (Drift for individual parameters shall be defined clearly in the offer.)
11.	Temperature coefficient	10PPM/ K or better (Bidder Should submit certificate of Reference standard along with Bid to specify the temperature coefficient of Reference standard)
12.	**Display -**The RSM shall have inbuild display for display following parameters.	– Phase wise and total three phase active, reactive and apparent Power/energies – RMS value of Phase to Phase and Phase to neutral voltages – RMS value of Phase wise currents

				– Phase wise power factor and total three-phase power factor for active as well as reactive component. – Phase angle between voltage and current vectors phase wise – Phase angle between the phase voltages – Mains Frequency – Voltage & Current display in waveform shape (Graphics Display in software) – Content of harmonics analysis & display for voltage, current, power (Active, Reactive & Apparent) in tabular form (total and phase wise) – Voltage & Current Phase sequence – Calculated error between the reference standard meters and the meter under test – Elapsed time from the beginning of the test – Number of disc revolutions or pulses from beginning of the test The selection facility shall be provided to select **minimum 8 parameters** out of these parameters. The RSM shall have facility to maintain last setting when it is switched off.
		13.	**Integration time**	Facility to select integration time between 1 to 99 second shall be provided in the RSM.
		14.	**Operation**	Membrane key board with membranes push button to operate the RSM shall be provided in the front of the RSM. Human touch based display is also acceptable.
		15.	**Reference Channel**	The RSM shall have facility to select reference for phase angle measurement. Selection of reference shall be provided manually and automatically.
		16.	**Frequency output**	This shall provide frequency output proportional to power to calibrate the reference standard against high precision reference standard. This output shall be in commonly used BNC type socket.
		17.	**Calibration**	The reference meter shall be provided along with calibration certificate from **national/international accredited laboratory**.

6.8	**SPECIFICATION OF HARMONIC INJECTION UNIT**	Over the range 0 to the 40th harmonics to the test voltage and test current, the magnitude of each harmonic shall be adjustable from 0-40% of the fundamental wave and the maximum peak value of the wave form shall be 130% of the magnitude of the fundamental wave. Facility of controlling the phase angle of harmonics shall also be provided. Necessary proof for generation of wave form and desired harmonics shall be submitted along with offer. Voltage output THD ≤0.3% Current output THD ≤0.5% The super-imposition of harmonics shall be possible to carry out all the tests prescribed at **Clause 5.3.**
6.9	**SPECIFICATION OF METER MOUNTING RACK**	a. One no of separate single sided Meter Mounting Racks(with Top Bottom arrangement) shall consist of a lightweight aluminum frame for mounting of sensor heads, display devices and meters-under-test. b. There shall be suitable provision for both vertical and horizontal adjustment of scanners so that each meter position shall be accessible by the scanning head. c. Design of the frames shall be such that 20 Nos. three phase, 3 wire or 4 wire, whole-current or CT-VT operated meter or single-phase meter can be safely and easily accommodated on each rack d. The meters shall get connected to the voltage and current circuits by means of color coded cables & quick connection device suitable for phase and neutral channel testing without manual intervention. e. The meter test rack shall have the facility /suitable ports to download data from internal memory of the meter under test from every test position. f. The meter test rack should have the facility to accept high frequency input to test RSM (reference standard meter) equal to the number of test meter positions. g. Necessary BNC type socket or any other suitable arrangement shall be provided on the Meter Mounting Rack to test the inbuilt RSS against a precision standard of higher accuracy without removing the inbuilt ERSS from the source cabinet. h. The offered software shall have facility to test the RSS in automatic mode by using these BNC type sockets i. Necessary cables shall be provided along with equipment to test RSS having frequency output on BNC type socket j. Facility to perform warm-up of Meter under Test before the testing shall also be provided. k. The internal wiring (current, voltage, etc,) are fully accessible by removal of covers. Current terminals provided on rack shall be so arranged to test any number of meters within above specified limits. l. The mounting rack shall have following features:

i. Scanning head at each meter test position with mounting arrangement. It can be adjustable both in depth and height.

ii. Error indication at each test position.

iii. Meter mounting frame with suitable cable leads

iv. Two Emergency switches on each meter suspension rack to switch off the complete supply from either of the switches in case of any emergency.

v. **Separate Warning lamp to indicate** – 1) Test bench ON, V&I OFF, 2) Test Bench ON & V ON only, 3) Test bench ON & V&I both ON (test in progress condition).

vi. Test rack should be easily moveable equipped with 360-degree rotating wheels and lock with adjustable height.

vii. It shall have a visual and audible signal to indicate over-voltage and over-current conditions.

viii. The MTS should be capable to withstand surges and voltage spikes by providing necessary isolation and/or suppression system built-in the meter.

m. All the component including Source, reference meter, PC System along with quick connector cable shall be concealed in the meter test rack itself, any separate cabinet is not be provided.

n. The rack which accommodates the source component in 19" rack mounted type arrangement shall be designed in such a way that temperature shall not increase abnormally during normal operation. Necessary display/indicator on rack shall be provided to continuously display the temperature inside 19" rack mounted type arrangement.

o. Suitable measures like **safety covers** (i.e. transparent acrylic sheet) on each quick connector and auto cut **air curtain** (With Enable/Disable facility) system shall be provided to ensure safety of testing personnel during the operation.

p. The offered meter test system should be capable to carry out following tamper tests simultaneously –

- Accuracy test for single phase meter for Phase element, Neutral element, Phase & neutral element combined together automatically without any manual connection/disconnection.
- Accuracy test for single phase meter in case of reverse power for Phase & Neutral channel for same magnitude of current.
- Facility to disconnection neutral simultaneously for all meters.

Compact and reliable meter mounting rack design shall be preferred to optimize space utilization.

6.10	SPECIFICATION FOR SCANNING HEAD AND ERROR INDICATION UNITS	**SCANNING HEAD:** a. Adequate number of scanning heads capable to detect the rotor mark of electromechanical (Ferraris) meters and infrared LED pulse detection of hybrid or static meters shall be provided. b. During testing, these photoelectric scanners shall give optical indication of pulses by LED to indicate the status of scanning/ sensing. Each scanning head shall also have a provision of selector switch to select either to scan the marking on the disk or the pulse LED or LCD pulse. c. Each scanning head should be designed in such a way that the scanning head can be fixed easily in a position which would facilitate accurate and proper testing of the meter-under-test. The scanners shall be suitable for fine adjustment in all three directions (vertical, horizontal and z-axis i.e. nearer and farther to the meter). d. The scanning head should be insensitive to ambient light. It should give optical indication of pulses by LED. The scanning head must be CE compliant to shut out the external ambient influence. e. The scanning head must be able to measure LED pulse output (as per IEC 62052-11, clause 5.11) of frequency up to 1 kHz. f. Mounting arrangement for scanning head should have facility to move vertical, horizontal, forward and backward directions. **ERROR INDICATION UNITS:** a. For simultaneous error measurement of meters under test, each meter position in the test rack shall be equipped with individual error calculator (LED) display unit. Display resolution for error shall be ±00.000% (5 digits) or better with dynamic decimal point and configurable by software. b. An Error Indication Device shall be mounted on each test position. There shall be provision on the error indication unit to reset the error or to repeat it if something is found wrong. The same should have acknowledgement function while doing testing of starting current and creep tests manually. c. The error calculator unit shall have reset button to reset the error and repeat if required. d. Error indication unit shall indicate the % error along with ± sign during accuracy test and also count the number of edge or pulse during the starting and creep test. e. The system shall have the facility to download data from internal memory of the meter under test from every test position. For the purpose of the communication. The bidder shall provide RS 232 / RS 485 / ethernet communication interface at every measuring position for downloading of data from MUT based on IEC 62056 Mode C communication / DLMS communication protocol. f. The Error evaluation system at every measuring position shall display the following parameters during test.

		i. Remaining pulses / timing of MUT during error test ii. Pulse counter during constant test iii. Text Display during Attributive test iv. Position Malfunction indication g. Display unit digit should be properly readable.
6.11	**SPECIFICATION FOR DIGITAL PROCESS UNIT**	For the simultaneous error measurement of 40 meters under test, the basic unit shall be equipped with: The system should be Communication Interface free. i. 40 inputs for scanning head pulses. ii. 1 input for reference output iii. 1 interface for connection with PC. iv. Controlled output for Dosage Operation (Dial Test).
6.12	**ISOLATING CURRENT TRANSFORMER (ICT)**	The automatic test bench shall be supplied with lightweight electronically compensated Isolation current transformer (ICT) suitable to test 20 nos. of energy meters i.e. one per phase per meter position in the current circuit of the test rack so as to test single-phase or three phase energy meters in closed link condition simultaneously. The ICT shall have protection facility & auto connection and disconnection of secondary circuit in case no connection of MUT is made on the secondary side. This should be visually displayed on every ICT. The rated current ratio of ICT shall be 1:1. The ICT shall have protection facility & auto connection and disconnection of secondary circuit in case no MUT connection is made on the secondary side. This should be visually displayed on every ICT. The ICT shall have following attributes. Nominal Primary Current 100A Maximum Primary Current 120A Nominal Secondary Current 100A Maximum Secondary Current 120A VA rating 50VA @ 120A Operating Burden (Maximum) 5 m Ω Ratio error 0.01 % (100 mA ... 120 A) or better Angle error 1 min (100 mA ... 120 A) or better Additional error in MTS 0.01 % (typical) The bidder shall also provide the performance details (Ratio Error, Phase Error and Additional error in Meter Test System for the current range from 1 mA to 100mA. **A certificate of offered ICT from NABL lab shall be provided along with bid to verify the asked accuracies.**

		• Supplier to ensure suitability of class 0.2 CT Operated Meters testing accurately using Installed ICT else There shall be provision to short any one or all ICTs. Suitable cables along with male and female plug-in type connectors shall be supplied along with the system to short all the ICTs without using any tool. This arrangement shall be provided by providing the necessary connectors on the Meter Mounting Rack. • There shall be provision to bypass the individual or all ICT automatically when secondary of ICT is kept open. Sufficient protection shall be provided to protect the ICT in case if secondary of ICT remain open while full load is running in primary. Suitable cables along with male and female plug-in type connectors shall be supplied along with the system to short all the ICTs without using any tool. This arrangement shall be provided by providing the necessary connectors on the Meter Mounting Rack. • Manufacturer should take care of ICT response to load switching of Smart meter. • LED indication shall be provided on ICT to indicate healthiness of ICT. • Secondary of ICT shall be designed in such a way that its secondary leads can be connected directly to Meter under Test. Ring type of design with loose primary/secondary type of connection shall not be provided. ICT's secondary & primary windings shall be permanently wounded on core with multiple turns. • Primary connection of ICT shall be fixed type and all primary connection on each ICT terminal shall be connected permanently. Primary & Secondary leads of ICT shall be designed in such a way that it can carry its maximum Current i.e. 120A for 2 hours continuously without any malfunction in ICT. • LED indication shall be provided on ICT to indicate healthiness of ICT. • Associate Software shall have facility to indicate fault in ICT like open circuit and over load on PC. It shall have facility to display message on computer screen about any fault in ICT during testing of meters. • All ICTs shall be fixed in the test rack. ICTs placement on top of the test rack shall not be provided.
7.	**CONNECTION CABLES AND QUICK CONNECTING SYSTEM**	• Apart from connection cables required to install and commission the meter test system itself, supplier shall provide complete set of connection cables for meters under test. The cables shall have to be colour coded (Red, Yellow, Blue for Phase circuit & Black for Neutral circuit current cables). In addition to above, the supplier shall provide following additional cables as spares as a part of the supplies. a. 2 set of colour coded voltage cables – (1 set shall have 4 nos. voltage cables for R-Y-B-N) b. 2 set of colour coded Current cables – (1 Set shall have 3 nos. current cables for R-Y-B phase having capacity upto 120A) c. Current shorting cable for each bench d. Any other connection cable required for testing of MUT (Meter Under Test) and calibration of DUC (Device Under Calibration)

		• Every measuring position on the meter test rack shall have quick connection system. This feature is highly desirable for fast connection and disconnection of MUTs. The construction of quick connection system shall be modular to enable mounting of Single-Phase meters of different make. The quick connection for current shall be rated for 120A current maximum for at least 2 hours. **The bidder shall supply additional 2 nos. of quick connector devices with as spares for continuous operation**. • All voltage connection cables shall be adequately insulated and shall comply with the applicable minimum CAT III safety requirements as per IEC 61010. • **The QCD (Quick Connector Device) shall be provided with a transparent, insulating safety glass cover** to prevent direct contact to live parts during testing. • QCD (Quick Connector Device) arrangement shall be designed to securely hold Meter Under Test (MUT) at all times. The meter shall remain firmly fixed during testing through a robust spring-loaded clamping mechanism, ensuring reliable electrical contact and preventing any movement of the meter during testing. **Note**: Closed link Direct Connected meters shall be directly connected to the secondary connection of ICTs.
8.	**SPECIFICATION OF COMPUTER SYSTEM**	The operating of the test equipment, the display of the actual values, the processing and display of the test results and the printout of the test results, reports etc should be effected by the associated Desktop Personal Computer system. The bidder shall specify the minimum specification of the computer system required for operating the MTS. The Desktop PC shall be connected to the measuring device and Energy source and necessary leads and cables for making these connections shall be provided by the vendor as a part of the system. Necessary requirement of any special ports in PC shall be intimated in advance. Computer system and printer will be in scope of Tata Power and will be in domain network of Tata Power where access to USB port is prohibited and under restricted network. Vendor to supply test bench and software which can be communicated and integrated to Tata Power domain network PC.
9.	**SPECIFICATION OF TEST SOFTWARES**	The meter test system shall be supplied with user friendly testing software having following features / attributes: • The MTS software system shall provide automatic testing of Ferraris and static meters against reference standard meter and enable computer-controlled error testing of **Single Phase/ Three Phase/ Smart/ Conventional/ Post paid/ Prepaid** meters. The software

		shall allow simultaneous testing of all meters under test having different meter constant but same voltage and current ratings. • The MTS software shall run on a personal computer under 64-bit with Microsoft® Windows™ Operating System of Windows 11 and above. The bidder shall ensure to provide periodic free of cost updates within the guarantee period with advancement/ upgradation in Operating systems. • The application software in English language shall be windows based and user friendly to facilitate sequential (fully automatic) and continuous mode (manual) of testing on meters. • The system must store all data in a relational-type database which also has the capacity to manage the objects. The preferred database for this application would be Microsoft SQL Server or Oracle. • The manual mode of operation of the licensed proprietary software of the meter-testing equipment shall allow, at least, performance of the following tasks: • Controlling of the source • displaying of test parameters (actual values) on PC screen • displaying the waveform of output voltage and current and harmonics analysis • Performance of the accuracy tests • The automatic mode of operation of the licensed proprietary software of the meter-testing equipment should have different modules to prepare meter test- sequence so as to carry out the testing in fully automatic mode. These modules shall be designed in such a way that user can prepare the test sequence very easily. The licensed proprietary software of the meter-testing equipment shall allow, at least, performance of the following tasks: • User interface to operate the system: • Easy to prepare test-tables by using “drag & drop“ or selection concept (it shall be user friendly) • Supervision and control of test procedure • Supervision and display of the test current and voltage • Indication of the errors of the meters-under-test • Evaluation of the test results and generation of test-reports in user defined format • Manual testing and automatic testing facility • **Also manual testing facility with panel keys to be possible without operating software and PC**. • Facility to define test parameters in terms of percentage and absolute terms • Facility to define error limit in two levels • Facility to change resolution of error • Facility to protect the system from over voltage in manual mode and automatic mode • Facility to check meters for short circuit and open circuit conditions prior to starting of the testing in fully automatic mode for each

		sequence • Facility to interrupt the testing and restarting it again • Password facility for administrator and operator with different levels of authorization • Print out facility of test-reports with desired headers. • Facility to take back-up of data for selective dates. • Absolute measurement with higher precision / more accurate standard in fully automatic mode using BNC type socket provided on Meter Mounting Rack • Testing facility of meters with different constants • Facility to display of different output voltages and currents • Displaying the curve of test voltage and current in presence of Harmonics • Protection of meters under test from high voltage and current • The software shall be capable to generate special waveforms according to the IEC 62052-11 and IEC 62053-11 defined under the chapters 11, 21, 22, 23 for the different meter classes. This includes voltage dip, voltage interruptions, voltage interruption one cycle, phase fired waveform, burst control waveform, etc. • The software shall support display of following quantities: • Single Phase & Three Phase active, reactive and apparent energies • Phase to Phase and Phase to neutral voltages • Phase wise currents • Phase wise Power factor and total phase Power factor • Active, reactive and apparent power phase wise and total • Phase angle between voltage and current vectors phase wise • Phase angle between the phase voltages • Mains Frequency • Content of harmonics (total and phase wise) • Phase sequence • Calculated error between the reference standard meters and the meter under test • Elapsed time from the beginning of the test • Number of disk revolutions or pulses from beginning of the test • Min 10-Digit Alphanumeric meter serial number (to be entered by the operator through keypad or through barcode scanner input) • The MTS software shall also allow operator to enter the details (rated voltage, basic current, maximum current, meter constant and the accuracy Class) of meter under test. Based on these data it shall carry out the testing operations on the meters under test on the test bench. • The software shall allow operator to • Create type table (data of meter type) • Test sequence (as per IS and IEC standards) • Conduct automatic testing which means generate, control, monitor the test parameter and test sequence, conduct the testing, indicate the result on PC monitor, store the result and printout the results.

		• **The extracted format shall be strictly in TPC defined format as defined. The defined format may be changed later depending upon business requirement.** • Conduct the influence quantity testing as per IS and IEC standard • The various test points for these tests shall be kept as database tables either based on standards or user specific. The software shall support user defined test plan and performing the testing sequentially on the selected test points according to the plan. • The MTS software shall be menu driven and shall include clearly understood screen windows referring to the test sequence and selection. This shall allow the user to efficiently use the capabilities and reduce data entry from the keyboard. • The software shall be designed for ease of learning, ease of use and high productivity. The operation of the software shall be simple and online help shall be provided at screen windows. The modular software shall facilitate the testing procedures by guiding the user to set the test bench system according to test points control of testing sequence and the testing parameters evaluation and display of meter error and their status to provide recording of testing results. • All components in system software shall have uniform appearance and interact instantly and seamlessly with each other in a multi-tasking software environment. • The desktop software shall be graphics oriented and provide for rapid and automatic processing of data in order to maximize productivity. • The software should be flexible in its naming conventions. • The software shall offer sequential reporting, statistics analysis and printing of test results in user defined formats. **All the acceptance testing including accuracy, smart meter load switch, dial test, MD reset, etc after completion of testing will be carried out automatically without any manual intervention.** • The system shall also integrate with commercially available office suites to allow producing user defined custom reports. • When running a report by date span, the system shall provide users with the option to enter specific start and stop dates, or to run reports using standard time scales such as today, yesterday, month to date, specific date etc. • All the communications shall have to be done through open protocol. The bidder shall provide all the details of protocol used for the communication as well as DLMS meter data communication at each position through the offered software. • The bidder shall furnish the **demonstration version** of the software along with the offer. • Password facility for administrator and operator with different levels • If bidder develops any software upgrade, or if any changes/upgrades are required in the Tata Power PC system, the bidder shall update, install and ensure compatibility of test software free of cost. Failure to provide the necessary updates and support may result in invocation of

Performance Bank Guarantee (PBG) as per the contract terms.

- The bidder shall also provide the **Software validation certification** along with the software.
- The licensed proprietary software of the meter-testing equipment shall be supplied **through Secured cloud based download/ SharePoint.**

Testing facilities for communication command for Smart Meters:

- **Communicate with all connected Smart meters on its optical port mounted on the test Bench.**

The test system shall be capable of communicating with the IS15959 /IS16444 compliant meters mounted on each position over the meter's optical port simultaneously. The system shall support communication with multiple meters of the same make as well as different makes and models, subject to compliance with same communication protocols. The necessary optical head shall be provided for each position on the test. Purchaser shall provide necessary requisite for establish communication with meter on optical port such as password, encryption details etc.

Response from each connected meter shall be received by associated test system software and reporting of each sent command along with response received from communicable meter shall be done by associated test system software.

- **Communicate with Smart meter over its GPRS/RF communication port.**

The Test bench shall be integrated with GPRS/RF (Network Interface Card/gateway/DCU) for communication with all connected Smart Meters. Bidder shall provide necessary provision with test bench to integrate available RF device. The requisite shall be provided by Purchaser with necessary Protocol and API command details for RF receiver/gateway/cloud server), hardware description such as port details and pin diagrams, logging credential for cloud/ server interface etc. or any other necessary requisite to integrate the same with test system.
Test software shall have provision for received response from each connected meter using RF communication medium. There shall be provision for compare the received output with the response received from the optical ports for each connected meter.
The facility shall be provided in the associate test software to report the sent command and response received from each energy meters.

Purchaser will provide the necessary security information for readout and writing of parameters from SMART meters.

- **Functional test**

The Test system shall perform all the routine functional test as mentioned below simultaneously on all connected meters on the test bench over the

		communication port. • **As per Table A30 of IS15959 Part2 and Table 29 of IS15959 Part3** **Associations** The associated test system software shall have facility to check object list of the current association of all connected smart meters on meter test bench. The test shall be conducted using each association at a time such as Public Client, MR and US (HLS) via communication port by sending OBIS code to read the object list. The report for each association shall be generated for its accessible attributes i.e. object list using associated test system software. **Data read** The associated test system software shall have facility for selecting any five or more readouts from instantaneous parameter list table of IS15959 Part2 (Table A1 and Table A14) and IS15959 Part3 (Table 1 and Table 14). The user can select/ deselect the random parameters from the instantaneous parameters list table as per requirement of the specification using associated test system software. The test shall be conducted using any suitable association such as MR and US (HLS) via communication port and sending OBIS code command for individual parameter read (instantaneous Voltage, PF, frequency, energy etc.). The report for each readout shall be generated for its response from the smart meter using associated test system software. **Profile read as per Table A4 of IS15959 part 2 and as per table 4 of IS15959 part 3** The associated test system software shall have facility to readout the Billing profile parameter of all connected DLMS compliant smart meters simultaneously with the test bench. The report for Profile read shall be generated using associated test system software. **Selective programmability as per Table A13 of IS15959 part 2 and as per table 13 of IS15959 part 3** The associated test system software shall have facility perform execution of any two or more parameter (except the image transfer) from list table of IS15959 Part 2 (Table A13) and IS15959 Part 3 (Table 13). The user can select/ deselect the random parameters from the list table as per requirement of the specification using associated test system software. **Connect/disconnect** The associated test system software shall have facility to readout the status of connect /disconnect state of all connected meters simultaneously with the test bench with ON & OFF load condition. The test shall be conducted using any suitable association such as MR and

US (HLS) via communication port and sending OBIS code command for reading the status of load switch.

The report for readout status of load switch shall be generated using associated test system software.

- **Name plate details**

The associated test bench software shall communicate with the smart meter to read its name plate details as per corresponding table of IS 15959 Part2 (Table A12 and A26), IS15959 Part3 (Table 12 and Table 25).
The test shall be conducted once the HDLC connection is established between client and server using any association at a time such Public Client, MR and US(HLS) via communication and sending OBIS code command for name plate details (Serial No. manufacturer year etc.).
The report for response i.e. readout of nameplate details from the smart meter for each OBIS code shall be generated using associated test system software.

- **Provision for Burden measurement of the smart meter:**

The test bench shall have facility to measure burden (power consumption) for **atleast 5 meter position** automatically as per clause no 6.10.1 of IS16444 (part 1and 2) using suitable methods:

The power consumption in voltage circuit has to be measured in following conditions:

- During idle mode of communication module
- If a separate module to service a IHD is present
- During data transmission per communication module.

Under each of above-mentioned condition, the burden measurement in the voltage circuit shall be performed using suitable Burden measurement unit sequentially for atleast 5 meter position of test bench one by one. The Burden Measurement unit shall have communication with test bench software for fetching the measured results automatically. The measured results reported using associated test system software. **Bidder to provide technical details of Burden Measurement unit alongwith bid.**

The Specification and feature of Burden Measurement Unit shall be as follows:

- Integration of measured power and reporting & Measurement of peak power during the test.
- Automatically reading through test bench associate software.
- Measurement of current in voltage circuit using clamp on CT and without breaking the voltage connection.

The burden measurement unit shall also be **capable to measure power consumption of current circuit of Smart Energy Meter.**

- **Verification of electrical tamper conditions.**

Following Electrical Tamper conditions shall be created for its occurrence and restoration by the test bench. The created event shall be verified over the optical port and RF port for connected meters against the test conditions simulated by operator. These tests shall run in automatic mode simultaneously for all connected meters on test bench. Test shall be performed for both occurrence and restoration of corresponding tamper condition.

- Voltage missing
- Low voltage in any phase
- Voltage unbalance
- Current missing
- Current reversal
- Current unbalance
- And any other tamper conditions defined in IS and TPC specs

The associated test bench software shall have the possibility to show the response received over different communication port such as optical and GPRS/RF on the same connected Smart meter on the test bench.
The report shall be generated based on the comparison of the above test and shall clearly indicate whether the result is similar or different.

- **Stress test**

Test bench shall be able to create the metrological stress conditions to all connected meters on the test bench as mentioned below: -

a. 10% of 3rd harmonics in phase in current, as per IS13779/14697
b. 10% 5th harmonics in voltage and 40% of 5th harmonics in current,
c. 120% of Vref, as per IS13779/14697
d. Imax applied to the meter, as per IS13779
e. 60% of Vref,
f. frequency variation +10%
g. frequency variation -10%
h. low PF such as 0.1PF

All above conditions shall be simulated by test system and the communication of the smart meter shall be verified in the influenced conditions through performing any one functional test as per above clause no. C. The associate test system software shall be having facility to report any discrepancy in the response from meter in normal condition and stressed condition.

- SNRM/UA as per clause 4.1 and 4.2 of IS 15959 part1
- Security as per clause 7.5 of IS 15959 part-1
- Block load profile parameters table A2 of IS 15959 part 2 and table 2 of IS15959 part -3
- Selective access by range of Block load profile parameters as per clause 11.3 of IS 15959 part-1

		• Daily load profile parameters s per table A3 of IS 15959 part 2 and table 3 of IS15959 part -3 • Selective access by range of Daily load profile parameters as per clause 11.3 of IS 15959 part-1 • ToU setting as per clause 9 of IS 15959 part-1 • Billing period and billing period counter as per clause 10.1 and 10.2 of IS 15959 part-1 • Selective access by Entry for billing load profile as per clause 11.3 of IS 15959 part-1 • Events and event log profile other than mentioned in functional test as per clause 8.1, 8.2 of IS 15959 part-1, table A-11 of IS15959 part -2 and table 11 of IS 15959 part-3 • Selective access by entry for event log profile as per clause 11.3 of IS 15959 part 1 • **Automatic testing of Communication:** The associated test bench system software shall communicate with all connected meters mounted on the test bench either as a single communication command OR combination of several communication commands included in one test sequence i.e. for meter read out and generation/simulation of the tamper conditions/ stress conditions by the test bench. The testing can be carried out in automatic mode to test the communication correctness on communication ports between all connected smart meters and the test bench. • **Integration of Available meters:** Bidder shall demonstrate the above-mentioned testing for minimum 3 different make of meters together available with Purchaser. Along with sample meters, the requisite shall be provided by Purchaser with necessary password, encryption details, Protocol and API command details for GPRS/RF receiver/gateway/cloud server), hardware description such as port details and pin diagrams, logging credential for cloud/ server interface etc. or any other necessary requisite to integrate the same with test system. Bidder noted that, in case Bidder shall not able to demonstrate the desired functionality during evaluation the bid of aforesaid bidder shall not be considered. **<u>Testing functions for Smart Meters as per Amendment</u>** **Communicate with Smart meter through API of HES (test server)** The Test bench shall be integrated with API to communicate test server for end-to-end testing of all connected smart meters simultaneously. Test software shall have provision for receive response from each connected smart meter using API of HES test server. All alerts generation and OTA operation shall also be performed using test bench software after API integration.

		The facility shall be provided in the associate test software to report the sent command and response received from each energy meters without any extra cost. **Checking and comparing RTC of smart meters.** The test bench software shall be capable to read RTC of all connected meters and able to find out the drift. If the drift shall be more than permissible limits of the Standards / Utility specifications, the software shall do evaluation of results and declare Fail or Pass. **The reporting of RTC drift shall be done using test bench associate software.** The test bench software also shall be capable to set the RTC of connected smart energy meters. **Verification of display by comparing RTC of smart meters.** The test bench software shall be capable read out with Display of connected smart energy meters. The software shall have facility to enter the visible display readings. The reporting of comparison of display values shall be done using test bench associate software. **Verification of Security.** The test bench software shall be capable change LLS password and again meter can be accessible with the new set password. Necessary selective readouts as mentioned in technical specification shall be read after changing of password (i.e. with new password). The reporting of this functionality shall be done using test bench associate software. **Load limit verification.** The test bench software shall be capable to verify the load Limit of smart meters. The test bench software shall read the load limit defined at energy meter. After that Test bench shall set to the necessary load so that meter shall detect load limit condition and cutoff stage shall be occurred. The reporting of this functionality shall be done using test bench associate software. **First Breath and Last Gasp verification.** The test bench software shall be capable to verify First Breath and last gasp functionality of smart meters. The test bench software shall create the necessary condition on connected energy meters and verify the First breath and last gasp functionality. The reporting of this functionality shall be done using test bench associate software.
10.	**CALIBRATION AND TESTING**	The equipment shall be supplied along with the manufacturer's test certificate/s of the individual components of the meter-testing system such as Source, Voltage and Current Amplifiers, ERSS, Meter-Mounting Rack, Scanning-heads, Digital

		Process Unit, and the complete meter- testing system. Additionally, calibration certificate of the ERSS, ICTs & MSVT for the entire range of power/energy/voltage/current/PF/frequency/THD-Active/Reactive measurement valid for at least 12 months from the date of calibration. The calibration certificate of the ERSS, ICTs & MSVT shall be issued by nationally accredited laboratory. The test bench shall be supplied with calibration of source from nationally ISO 17025 accredited laboratory. Sample load points of ERSS, MSVT,ICT & Source will be mutually decided during order placement. **Yearly on-site calibration covering complete electrical measurement range shall be carried out by bidder through NABL-accredited laboratory for another 9 years, i.e., from the 2nd year to the 10th year after commissioning of test benches.** **If any drift or deviation is observed during calibration, bidder shall rectify the same and perform necessary re-calibration at no additional cost to the purchaser**.
11.	**NAME PLATE AND MARKING**	All the components and Operating Devices of the test bench shall be provided with durable MARKING and legible nameplates containing all technical parameters. Name shall be embossed with **"PO No. with date, "Property of TATA POWER, MUMBAI DISTRIBUTION", along with Manufacturer's Name and Manufacturing year**
12.	**TESTS**	All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine & type tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Calibration certificate of the Reference Standard which will be supplied should have calibration certificate valid for a period of one year. This calibration should be done from laboratory accredited as per ISO/I EC 17025. Name of the laboratory shall be given in the bid.
13.	**TYPE TEST CERTIFICATE**	Bidder must submit type test certificate of similar model fully automatic test system as per IS 12346. Type test should have been conducted in certified Test Laboratories during the

		period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to Tata Power or else the bid will not be accepted.
14.	**ROUTINE/ACCEPTANCE TEST**	The following checks are to be carried out for Fully- automatic Meter Testing Bench as per Appendix B {Clause 8) of IS 12346 detailed as under as applicable for fully -automatic test benches: 1. Mechanical construction. 2. Wiring and connections specially those of parts which can be moved. 3. Stated accuracy of all measuring instruments. 4. Di-electric properties. 5. Phase Sequence. 6. Voltage Circuit Control. 7. Measuring range verification. 8. Voltage adjusting facility, regulating capacity at various loads. 9. Voltage balance adjustment facility. 10. Verification of VA burden of voltage circuit. 11. Verification of VA burden of current circuit. 12. Current Circuit control. 13. Measuring range verification. 14. Current circuit regulating facility and verification of capacity on various loads. 15. Measuring circuits. 16. Accuracy of display of various parameters like, current, voltage, P.F., phase angle etc. of measuring range, measuring methods, checking of phase displacement (lagging-leading). 17. Accuracy of measurement of energy by connecting High precision reference meter with it. 18. Distortion factor Control 19. Input terminals of meter testing bench. 20. Output terminals of Meter Testing Bench. 21. Software operated controls for measurements of voltage & current circuits & other parameters. 22. Verification of various output reports.
15.	**DEMONSTRATION**	The Bidder shall arrange physical demonstration of exactly the same tendered functionality of test bench within 15 days from the date of closing of tender during technical evaluation at Bidder's cost. If bidder fail to arrange the same, bid shall not be consider for further evaluation.

16.	**PRE-DISPATCH INSPECTION (FAT)**	Equipment shall be subject to inspection by a duly authorized representative of the TATA POWER. Bidder shall grant free access to the places of manufacture to Tata Power's representatives at all times when the work is in progress. Inspection may be made at any stage of manufacture at the discretion of the purchaser and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by Tata Power. Following documents shall be sent along with material a) Test reports b) MDCC issued by Tata Power c) lnvoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee Warrantee card g) Delivery Challan h) Other Documents (as applicable) The bidder shall be responsible for arranging and bearing all costs associated with the visit, including travel from the Tata Power office location to bidder's factory, local conveyance, lodging, boarding and any other required arrangements for minimum 2 personnel.
17.	**INSPECTION AFTER RECEIPT AT STORE**	The material received at TATA POWER store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Corporate Contracts team.
18.	**PACKING**	Bidder shall ensure that all material covered under this specification shall be prepared for rail/road transport (local equipment) and be packed in such a

		manner as to protect it from damage in transit. The material used for packing shall be environmentally friendly. The bidder shall bear full responsibility for safety and integrity of equipment until its successful installation and commissioning at designated location. Any damage, loss or shortage occurring till successful installation and commissioning shall be rectified or replaced by the bidder at no additional cost to purchaser.
19.	**DRAWING AND DOCUMENTATION**	One set of following documents shall be supplied along with each test system based on Tata Power specification. • Completely filled in Technical Parameters • Operating manual of each component of test equipment like reference standard, amplifier, etc. • Wiring diagram Power Source Cabinet with power source installation, Meter mounting rack, Fixing arrangement of MSVT & ICT, Voltage and current circuit connection diagrams, Fixing arrangement for scanner head and error calculation unit. • An outline general arrangement drawing showing plan, front and rear view of the Test system plan of the Meter Test Equipment with principal dimensions. • Details of cables accessories. • Drawing showing constructional details and dimensions. • Service manuals. It should include troubleshooting & remedies for minor problems of Meter Test Equipment. • Separate testing software manual describing step by step testing procedures with help of screen snap shots shall be given at the time of delivery. • Calibration certificate of reference standard, ICT, MSVT from National/International ISO 17025:2017 laboratory. • Test certificate of complete test system including individual components • Type test certificate • Experience list • Manufacturing schedule and test schedule • All manuals in hard copy as well in soft copy through %Secured clouse based download/Sharepoint. • All the documents & drawings shall be in English language only.
20.	**INSTALLATION AND COMMISSIOING**	The Bidder shall be responsible to install & commission the meter test equipment at the purchaser location(It may be above ground level). The supplier shall submit the layout plan, installation proposal and electric supply requirements within 2 weeks after receiving the purchase order. The Purchaser shall arrange the appropriate room, location, electric supply etc. as defined in IEC 62052-11 before the supply of the system so as to permit the smooth and proper installation of the system immediately upon its delivery to the designated location/s. Do's and Don'ts shall be provided by bidder regarding operation and testing.

		A refresher course shall also be arranged by the supplier during the Guarantee period once in a year at laboratory.
21.	**TRAINING**	The Bidder shall provide training on operation, maintenance and trouble shooting of the meter test equipment and testing software to atleast 5 engineers of Tata Power for minimum 6 days. (Excluding the period of Installation and commissioning) . All expenses for providing such training support shall be borne by the vendor and shall ensure to provide full support whenever required in future.
22.	**TECHNICAL SUPPORT**	Bidder shall have trained engineers based in India who can attend to trouble shooting at the shortest notice period within 2 days, during guarantee period and further also. In support of this, bidder have to submit List of Employees, List of Plant and Machinery, tools and tackles to carry out service and purchase order copy of Running Annual Maintenance Contract (AMC) of 5 Nos. of similar or better Energy Meter test benches from govt. power utilities/govt. NABL laboratories under qualifying requirement.
23.	**Warranty**	Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a **period of at least 120 months from the date of commissioning or 126 months from the date of last supplies** made under the contract whichever is earlier, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of the Company, failing which the purchaser will be at liberty to get it replaced/rectified at bidder's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the bidder or from the " Security cum Performance Deposit" as the case may be. **A comprehensive warranty is expected to cover all components of the meter test system, including the Reference Standard Meter (RSM), Source, Voltage Amplifier, Current Amplifier, ICT, MSVT, Scanning Heads, Digital System, Error Calculation Units, Meter Mounting Rack and all associated mechanical parts. The warranty shall also cover any damage caused due to rodent infestation, including damage to cables, wiring, connectors, insulation and other system components, the bidder shall be responsible for repairing or replacing such affected parts during the warranty period at no additional cost to Tata Power.** **The bidder shall send their representative twice in a year for preventive maintenance of the test benches.** Bidder shall further be responsible for 'free replacement at site' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the purchaser. During guarantee period if any part/ component need to be sent out of India for

		repairs or for any other reason then all freight, clearances & allied expenses for sending this part/ component shall be borne by supplier. The manufacturer shall give assurance to supply spares of Fully Automatic Test Bench for 20 years from supply. **Undertaking to be submitted along with Bid.**
24.	**3D BLUETOOTH QR/BARCODE SCANNER**	Good brand **3D BLUETOOTH QR/BARCODE SCANNER** with rechargeable battery to be provided with each test system free of cost with alteast 5 years of warranty.
25.	**MINIMUM TESTING FACILTY**	Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards/TPC specification. The bidder shall have duly calibrated Reference Standard meter of Class 0.01 accuracy or better.
26.	**MANUFACTURING ACTIVITIES**	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart shall be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.
27.	**QUALITY CONTROL**	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. • The bidder shall invariably furnish following information along with his bid, failing which his bid shall be liable for rejection. Information shall be separately given for individual type of equipment offered. a) Statement giving list of important raw materials, names of sub-suppliers for the b) raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in the presence of bidder's representative, copies of test certificates. c) Information and copies of test certificates as in (I) above in respect of bought out accessories. d) List of manufacturing facilities available. e) Level of automation achieved and list of areas where manual processing exists. f) List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such test and inspection. g) List of testing equipment available with the bidder for final testing of equipment along with valid calibration reports shall be furnished with the bid. Manufacturer shall posses 0.1 class instruments for measurement of losses.

		h) Quality Assurance Plan (QAP) with hold points for Purchaser's inspection as per annexure. • The successful bidder shall within 30 days of placement of order, submit following information to the Purchaser. a. List of raw materials as well as bought out accessories and the names of sub-suppliers selected from those furnished along with offer. b. Type test certificates of the raw materials and bought out accessories. • The successful bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing.
28.	**SERVICE SUPPORT AND SERVICE LEVEL AGREEMENT**	• During guarantee period, the bidder shall arrange minimum 2 nos. regular service visits in a year. The visits shall be planned on mutually convenient dates with TATA Power officers, without any extra charges. • Beside the 2 nos. scheduled service visits, as and when required, the bidder shall arrange unforeseen/unscheduled visit without any extra charges during breakdown of test bench in a year for resolution of the breakdown. • Additionally, the bidder shall provide the tele and video call support as and when required for any software and hardware related minor issues or upgradation which can be handled by Tata Power officers. • Any breakdown of test bench shall be attended by bidder representative within 48 hours for resolution of the problem. • During troubleshooting of test bench by your representative while his visit, if any component / equipment is found defective and required to be replaced / repaired (component / equipment which cannot be repaired at site) within the above guaranteed period shall be replaced / repaired by the supplier free of cost within 15 working days of receipt of intimation. • Failure to adhere to this timeline attracts a penalty of Rs. 2000/- per day per instance which will be recovered from the outstanding bills payable/ Performance bank guarantee/ retention money. • If the defective equipment / components are not replaced / repaired within 3 months from the date of intimation, Tata Power shall have the rights to forfeit the retention money / Performance Bank Guarantee provided / applicable for this PO. • The replaced/repaired equipment / components shall have a guarantee period of six months from the date of replacement / repair or the remaining period of guarantee, whichever is later. • The bidder shall ensure availability of spare parts and Service support for the offered test bench set up / equipment and its accessories for a minimum period of 5 years after completion of Guarantee period. • The bidder shall give at-least 12 months advance notice to Tata Power before phasing out the model of supplied test bench set-up / individual equipment and/or accessories from its manufacturing range. This will enable Tata Power to plan for placement of order for any spares etc. In the event of bidder phasing out or discontinuing the set up and its accessories without intimation, the bidder would be liable to bear the consequential cost of replacement of that equipment which could not be re-used due to unavailability of

<table>
<tr><td></td><td></td><td>spares/service from the bidder.
• The Supplier shall extend necessary support to Tata Power in the event of shifting of the equipment to any other premises/ location of Tata Power business units. This can be treated as additional services on chargeable basis.
• The bidder shall recommend the list of spares and quantity of spares to be kept by the purchaser for uninterrupted services of the Test bench System.</td></tr>
<tr><td>29.</td><td>GTP (GARANTEED TECHNICAL PARTICULARS)</td><td>Completely clause wise compliance to be submitted for Manufacturing clearance.</td></tr>
<tr><td>30.</td><td>SCHEDULE OF DEVIATIONS</td><td><u>(TO BE ENCLOSED WITH THE BID)</u>

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

<table>
<tr><th>S.No.</th><th>Clause No.</th><th>Details of deviation with justifications</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

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

Seal of the Company:

Signature

Designation</td></tr>
</table>

FORMAT F.1

Format for Query / Clarification / Deviation (QCD)

Tender No

Package Name

Bidder :

Note : The said format to be used only for any Pre-bid Query / Clarifiaction/ Deviation on any of the Tender documents

Sr. No.	Detailed Reference to concerned Document . Please specify Document No / Clause No / Page No	Description as per Bid Document	Query / Clarification / Deviation	Tata Power Response
1	2	3	4	5

Format of BID BG / EMD

Whereas (Name of the Contractor), a Company incorporated under the Indian Companies Act 1956, having its Registered office at _____, (hereinafter called the "BIDDER") has in response to your Invitation to Bid against Enquiry No. _____dated _____, for (name of work), offered to supply and/or execute the works as contained in Employers letter dated _____.

AND WHEREAS BIDDER is required to furnish to you a Bank Guarantee for the sum of Rs._____/-(Rupees ____ only) as Earnest Money against Bidder's offer as aforesaid.

AND WHEREAS we, (name of the bank) having our Registered Office at _____and Branch office at _____, have at the request of Bidder, agreed to give you this Guarantee as hereinafter contained.

NOW THEREFORE, in lieu of earnest money deposit, we, the undersigned, hereby covenant that the aforesaid Bid of the BIDDER shall remain open for acceptance by you during the period of validity as mentioned in the Bid Document or any extension thereof as requested by you and if Bidder shall for any reason back out, whether expressly or impliedly, from this said Bid during the period of its validity or any extension thereof as aforesaid, we hereby guarantee to you the payment of the sum of Rs._____/-(Rupees ____ only) on demand and without demur and notwithstanding the existence of any dispute between you and the BIDDER in this regard and we hereby further agree as follows:

(a) You shall have the right to file/make a claim on us under the Guarantee for a further period of six months from the said date of expiry.

(b) That this guarantee shall not be revoked during its currency without your written express consent.

(c) That you may without affecting this guarantee grant time or other indulgence to or negotiate further with BIDDER in regard to the conditions contained in the said Bid document and thereby modify these conditions or add thereto any further conditions as may be mutually agreed upon between you and BIDDER.

(d) That the guarantee hereinbefore contained shall not be affected by any change in the constitution of our Bank or in the constitution of BIDDER.

(e) That any account settled between you and BIDDER shall be conclusive evidence against us of the amount due hereunder and shall not be questioned by us.

(f) That this guarantee commences from the date hereof and shall remain in force till BIDDER, if his Bid is accepted by you, furnishes the Contract Performance Guarantee as required under the said specifications and executes formal Contract Agreement as therein provided or till 210 Days from the date of submission of the Bid by the BIDDER i.e. (expiry date), whichever is earlier.

(g) That the expression, BIDDER and Bank, and OWNER herein used shall, unless such an interpretation is repugnant to the subject or context, include their respective successors and assignees.

(h) Notwithstanding anything herein contained, our liability under this guarantee is limited to Rs._____/-(Rupees _____only) and the Guarantee will remain in force upto and including and shall be extended from time to time for such period or periods as may be desired by you. Unless a demand or claim under this Guarantee is received by us in writing within six months from (expiry date), i.e. on or before (claim period date), we shall be discharged from all liabilities under this guarantee thereafter.

(i) Any claim/extension under the guarantee can be lodge able at issuing outstation bank or at Mumbai branch and claim will also be payable at Mumbai Branch. **(To be confirmed by Mumbai Branch by a letter to that effect)**

Notwithstanding anything contained herein above:

a) Our liability under this Bank Guarantee shall not exceed Rs._____/-(Rupees _____ only).
b) This Bank Guarantee shall be valid upto ---------- 200.
c) Our Liability to make payment shall arise and we are liable to pay the guaranteed amount or any part there of under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before ---------- 200.

The Tata Power Company Limited is hereunder referred to as the "Purchaser" or "Company". The person, firm or company selling the goods, the subject of this purchase order is referred to as "Vendor" or "Contractor". The subject of this purchase order is hereinafter referred to as the "Material(s)"or "Goods".

The Contract shall mean the contract as derived from the following:

1. Purchase Order (with 'Commercial Notes' and Annexures to the Purchase Order referred thereon)
2. Technical Specifications.
3. General Terms & Conditions

The documents including all reference document (s) and Annexures forming the Contract are to be read together as a whole and are to be taken as mutually explanatory.

1. Price:

Unless otherwise specifically stipulated, the price shall be firm and shall not be subject to escalation for any reason till the validity of this Contract.

Unless otherwise specifically stipulated, the price shall be inclusive of road/ rail worthy water-proof packing & forwarding charges up to effecting delivery at FOT/ FOR despatch point, GST and shall also be inclusive of inland freight, terminal taxes and entry taxes as leviable on the transportation or entry of goods into any local area limits pursuant to the Contact.

2. Taxes and Duties:

2.1 The Contract Price shall be inclusive of all taxes, duties, including but not limited to GST or any local taxes, levies imposed by State/Central/Local governments

2.2 Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break-up of the taxes

2.3 However the payment of GST or local levies shall be restricted to the total amount as indicated in the price schedule.

2.4 Any duties, levies or taxes not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) shall be deemed to be included in the Contract price and shall be to the account of the Contractor.

2.5 Any statutory variation in duties, levies or taxes if applicable and specified in this Contract till the scheduled date for supply of Goods and limited to direct invoices of the Contractor shall be to the account of Purchaser. The Contractor shall have the obligation to provide the necessary documentary evidence / supporting by way of gazetted notifications etc. to prove the change in such levies or taxes between the due date of submission of the Bid and the scheduled date of supply of goods to claim the difference.

2.6 The Contractor shall pass on to the Purchaser all the benefits of either reduction in tax rates, exemptions, concessions, rebate, set off, credits etc. or introduction of new tax rates exemptions, concessions, rebate, set off, credits etc. pertaining to all taxes, duties, imposts, fees and levies in respect of the supplies of Goods or performance of obligations under the contract. This would specifically include reduction of tax rates as a result of statutory changes or judicial rulings.

2.7 Any other taxes, levies and duties not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) or introduction (omission) of new taxes, levies and duties shall be deemed to be included in the Contract Price and shall be to the account of the Contractor.

2.8 For facilitating availment of a credit, set-off, rebate, drawback or like benefit available to the Purchaser, the Contractor will facilitate the Purchaser by providing the necessary documentary and/or procedural support. In any process of assessment or re-assessment, of taxes payable by the Purchaser. Wherever expressly agreed the purchaser would provide the statutory form 'C' to the seller for availing the concessional rate of Central sales tax.

2.9 The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.

2.10 Purchaser shall pay the invoices to the Vendor after necessary deductions as prescribed under the applicable law, income – tax or other

deductions under the State Tax laws as may be applicable to the Contract.

3 Packing details:

Packing details: The material must be packed in suitable packing to suit the mode of transport and to ensure its safe receipt at point of delivery. Any damage to material noticed at the time of delivery at site, due to improper packing or any other reason whatsoever shall be the responsibility of the Vendor. Such damaged goods shall be replaced within 14 days from intimation from the Purchaser.

4 Transportation and Unloading at Site:

The Vendor shall deliver the Material(s) at site/ Stores as per the delivery address specified in the Purchase order. The unloading at delivery shall be organised by the Purchaser unless otherwise specified. The receipt of the material/ equipment is subject to inspection and rejection if Material(s) is found unsatisfactory or any of the clauses under this purchase order are violated.

5 Insurance:

Unless otherwise specified, Purchaser will be responsible to obtain transit insurance for the Material(s). The Vendor shall intimate the Order Manager (as mentioned in the Purchase Order) along with Invoice, packing list, the Railway Receipt/Truck or Lorry Receipt etc. immediately after the consignment is booked, at the e-mail id mentioned in the Purchase order.

6 Payment Terms:

100% payment shall be made within 60 days from the receipt and acceptance of the material at the Consignee Stores/ Site/ Location as per the Contractual terms and conditions herein.

7 Bills and invoice:

The tax invoices should contain the details to comply with the GST Law. The supplier shall:

i) Furnish (electronically) and communicate to the Owner, the details of Goods or Services supplied by the 10th of the month succeeding the said tax period,
ii) Upon discovery of any discrepancy, rectify it and shall pay the tax and interest thereof,
iii) Furnish the returns (electronically), for the inward and outward supplies of Goods and/or Services, before the specified dates as per the GST Law,
iv) Communicate the tax paid, credits etc. as and when credited.
v) The Invoice should clearly state the description of the goods, quantity, sale price, tax %, and tax amount;
vi) The Invoice should be signed by an Authorized Signatory.

Bills/Invoices in the name of The Tata Power Company Ltd. with packing lists in triplicate shall be forwarded along with the equipment.

Contractor to furnish GST Registration no. in all invoices as well as Purchaser's (Tata Power's) GST no.

8 Transfer of Title and risk:

The transfer of property and risk of Material(s) shall be deemed to take place as follows:

a. For delivery F.O.R. or F.O.T. despatch point: Transfer of property on handing over the Material(s) to the carrier against receipt of clean Railway Receipt/Truck or Lorry Receipt and such receipt having been handed over to Purchaser. However, the risk of loss shall pass to the Purchaser on delivery of goods at the specified destination.

b. In case the Material(s) are procured by the Vendor from sub-vendors on receipt of duly endorsed documents of title to the goods.

9 Contract Performance Bank Guarantee (In case applicable):

9.1 The Vendor shall within 15 days of issue of this Purchase Order furnish an unconditional irrevocable bank guarantee duly stamped and strictly as per the prescribed format of the Purchaser from any nationalized bank or any scheduled bank having a branch in Mumbai and approved by the Purchaser for a sum equivalent to 10% of the Total value of Order valid for a period not less than 6 months from the expiry of the Warranty period.

9.2 Irrespective of the performance demonstrated as part of the Factory Acceptance Tests Take-over tests / Performance Tests etc, the Purchaser may call for re-validation of performance of the system during the performance guarantee period by conducting fresh performance tests if in its opinion, the

system is not able to deliver the designed performances based on its operational performance results. If the equipment fails to prove the performance during such performance tests, the Purchaser may allow the Vendor to either rectify the system by addition / modification of equipment etc at the Vendor's costs & risk to restore the performance levels. Failure to rectify the system to achieve the designed performance levels may result in imposition of penalties including revocation of the Performance Bank Guarantee and forfeiture of the entire amount under the Performance Guarantee.

9.3 In case the Vendor fails to furnish the requisite Bank Guarantee as stipulated above, then the Company shall have the option to terminate the contract besides other contractual remedies.

10 Price reduction:

10.1 The Vendor agrees that time of supply of Material(s) is of prime importance.
If the Vendor fails to supply Material(s) before the respective scheduled / fixed date for supply. Company may without prejudice to any other right or remedy available to the Company: -

10.1.1 Recover from the Vendor ascertained and agreed, genuine pre-estimate liquidated damages, and not by way of penalty, a sum equivalent to 1% (of total value of order) per week or part thereof for each week's delay, beyond the scheduled supply date each subject to maximum of 10% of the total order value, even though the Company may accept delay in supply after the expiry of the scheduled supply date. The Company may, at its discretion, set off the aforesaid amounts from any other amounts owed by the Company to the Vendor or recover such amounts in other manner as may be permissible under applicable laws.

10.1.2 Arrange to get supply from elsewhere on account and at the sole risk of the Vendor, such decision of the Company being final and binding on the Vendor; or

10.1.3 Terminate the contract or a portion of supply of the supply work thereof, and if so desired, arrange for the supply in default by the Vendor to be attained from elsewhere at the sole risks and costs of the Vendor.

10.2 Liquidated damages for performance shortfall (if applicable) shall be specified in the Technical Specifications.

10.3 The Liquidated Damages referred in this clause 10 may be recovered by the Company from the Vendor as set off against any monies owed by the Company to the Vendor or in any other manner permissible under applicable laws.

11 Warranties:

11.1 Materials and Workmanship: Vendor shall fully warrant that all the stores, equipment and component supplied under the order shall be new and of first class quality according to the specifications and shall be free from defects (even concealed fault, deficiency in design, materials and workmanship).

11.2 Should any defects be noticed in design, material and/or workmanship within 12 months after the Material(s) or any portion thereof as the case may be have been commissioned or for 24 months from the date of delivery, whichever period concludes earlier. Purchaser shall inform Vendor and Vendor shall immediately on receipt of such intimation, depute their personnel within 7 days to investigate the causes of defects and arrange rectification/ replacement/modification of the defective equipment at site, without any cost to Purchaser within a reasonable period. If the Vendor fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period, Purchaser shall be free to take such corrective action as may be deemed necessary at Vendor's risk and cost after giving notice to the Vendor, including arranging supply of the Goods from elsewhere at the sole risk and cost of the Vendor.

11.3 In case defects are of such nature that equipment shall have to be taken to Vendor's work for rectification etc., Vendor shall take the equipment at his costs after giving necessary undertaking or security as may be required by Purchaser. After repair Vendor shall deliver the equipment at site on freight paid basis. Any taxes applicable in relation to this repair shall be to the Vendor's account. All risks in transit to and fro shall be borne by the Vendor.

11.4 Equipment or spare parts thereof replaced shall have further warranty for a period of 12 months from the date of acceptance.

12 Quality, Testing, inspection, installation:

12.1 All Material(s) supplied under this Contract shall be new and unused.

12.2 Wherever a specific Quality Assurance Plan is provided with the Request for Quotation (RFQ) or agreed as part of the commercial/ technical discussions, the same shall be binding on the Vendor.

12.3 The material shall be inspected

a. At consignee end by Purchaser.

b. At factory premise of the Vendor/ sub-vendor by Purchaser or third party duly nominated by Purchaser. The Vendor shall extend all necessary co-operation to Purchaser/ third party inspector carrying out the inspection. The Inspector(s) shall have the right to carry out the inspection or testing, which will include inspection and testing of the raw materials at manufacturers shop, at fabricators shop and at the time of actual despatch before and/or after completion of packing.

12.4 The Vendor will inform Purchaser at least eight (8) days in advance of the exact place, date and time of tendering the Material(s) for required inspection and provide free access to the Inspector(s) during normal working hours at Vendor's or his/ its sub-Suppliers works, and place at the disposal of the Inspector(s) all useful means for undertaking the Inspection, checking the results of tests performed, marking the Material(s), getting additional tests conducted and final stamping of the Material(s).

12.5 Even if the inspection and tests are fully carried out, the Vendor shall not be absolved from its responsibilities to ensure that the Material(s), raw materials, components and other inputs are supplied strictly to conform and comply with all the requirements of the Contract at all stages, whether during manufacture and fabrication, or at the time of Delivery as on arrival at site and after its erection or start up or consumption, and during the defect liability period. The inspections and tests are merely intended to prima facie satisfy Purchaser that the Material(s) and the parts and components comply with the requirements of the Contract.

12.6 *All costs associated with the inspection shall be included in cost of Material(s).*

12.7 Original material test certificate/ performance test certificate/ fitment certificate/ test reports etc. relevant/ applicable as per the specifications/ standards shall be dispatched along with the material supply failing which the material may be rejected.

13 Rejection:

13.1 Rejected goods shall be removed and replaced within 14 days of the date of communication of rejection.

13.2 Claim in respect of breakage/shortages in any cases shall be referred on the Vendor within ninety (90) days from the date of receipt of Goods by the Purchaser which shall be replaced/made good by the Vendor at his own cost. All risk of loss or damage to the material shall be upon the Vendor till it is delivered to the purchaser/consignee.

14 **General Indemnity:**

The Vendor shall indemnify and keep the Purchaser indemnified from and against any and all claims, costs, liabilities (financial), litigations, compensations, judgments, expenses or damages (including attorney's fees and other related expenses) arising out of any breach or alleged breach of any of the conditions of this Contract, performance of the obligations hereunder, or any representation or misrepresentation made by the Vendor or any third party with regard to the subject of this Contract.

15 **Indemnity against IPR:**

The equipment, system, drawings, and other materials that shall be supplied against the order will become the Purchaser's property. Without limitation of any liability of whatsoever nature, the Purchaser shall be indemnified and kept indemnified against any claim for infringement or breach of any of the statues, rules & regulations by the use of or sale of any article or material supplied by the Vendor. The indemnity shall include any infringement of patent, trade mark, design, copyright or other property rights whether in Country of Origin, or elsewhere resulting from the Vendor's design, manufacture, use, supply or re-supply & would also cover use or sale of any article or material supplied by the Vendor to the Purchaser under the Purchase Order. The Indemnity shall cover any claim/action taken by a third party either directly against the Purchaser or any claim/action made against the Vendor & where under the Purchaser is made liable. The

Indemnity shall be for losses, damages, and costs including litigation costs, attorney fees etc incurred by the Purchaser in relation to the Purchase Order.

16 Latent Defects Liability period (if applicable):

Notwithstanding the inspections, acceptance tests, quality checks etc carried out by the Vendor and witnessed/accepted by the Purchaser, the Vendor shall further warrant the equipment for any latent defects in its design, material or workmanship against the specifications set forth and shall make good any such defects by way of repair or replacement of the part or whole of the defective product at its own cost & risks as and when such latent defects are observed and intimated by the Purchaser and intimated to the Vendor within 36 months of completion of warranty period.

17 Force Majeure:

17.1 In the event of either party being rendered unable by force majeure to perform any obligation required to be performed by it under this Contract the relative obligation of the party affected by such force majeure shall, after notice under this articles be suspended for the period during which such cause lasts. The term 'Force Majeure' as employed herein shall mean acts of God, wars (declared or undeclared), riots or civil commotion, fire, floods, and acts and regulations of the Government of India or State Government or any of the statutory agencies. Both the party shall pay to the other party, the amount payable upon the date of the occurrence of such force majeure.

17.2 Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid, thereby shall notify the other party in writing immediately but not later than twenty four (24) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of the claims.

17.3 During the period, the obligations of the parties are suspended by force majeure, the contractor shall not be entitled to payment of any rate.

17.4 In the event of the force majeure conditions continuing or reasonably expected to continue for a period more than thirty (30) days, Purchaser shall have the option of terminating the contract by giving seven (7) days notice thereof to the contractor.

18 Variation:

Except for any provisions in this Purchase Order, any change /modification to the terms and conditions of this Order can be issued only by Purchaser or with the prior written approval from Purchaser.

19 Termination

19.1 The Contract shall be deemed to be terminated on completion of delivery of Material(s)

19.2 Termination of Default by Vendor:
Purchaser may terminate the contract at any time if the Vendor fails to carry out any of his obligations including timely delivery under this Contract. Prior to termination, the Vendor shall be advised in writing of the causes of unsatisfactory performance to be improved upon 15 days of the receipt of notice. In case, if the Vendor fails to bring about the improvement to the satisfaction of the Purchaser, then the order shall be terminated.

19.3 Without prejudice to the rights and remedies available to Purchaser, Purchaser may terminate the Contract or part thereof with immediate effect with written notice to the Vendor if,:

19.3.1 The Vendor becomes bankrupt or goes into liquidation.

19.3.2 The Vendor makes a general assignment for the benefit of creditors.

19.3.3 A receiver is appointed for any substantial property owned by the Vendor.

19.3.4 The Vendor has misrepresented to Purchaser, acting on which misrepresentation Purchaser has placed the Purchase Order on the Vendor.

The Vendor/ Contractor shall not be entitled to any further payment under the Contract if the Contract is terminated. If the order is terminated under clause 19.2 and 19.3, the Vendor shall not be entitled to any further payment, except that, if Purchaser completes the supply of Material(s) and the costs of completion are less than the Total Order value, the Purchaser shall pay Vendor an amount properly allocable to supply of Material(s) fully performed by Vendor prior to termination for which payment was not made to Vendor. In case, the cost of completion of Material(s) exceed the total Order value, the additional cost incurred by Purchaser for such completion shall be paid by the Vendor.

19.4 Purchaser shall be entitled to terminate the Contract at it's convenience, at any time by giving thirty (30) Days prior notice to the Contractor. Such notice of termination shall specify that termination is for Companies convenience and the date upon which such termination becomes effective. Upon receipt of such notice, the Contractor shall proceed as follows:

19.4.1 cease all further work, except for such work as may be necessary and instructed by the Company/ Company's representative for the purpose of protecting those parts of the supplies already manufactured;

19.4.2 stop all further sub-contracting or purchasing activity, and terminate Sub-contracts;

19.4.3 handover all Documents, equipment, materials and spares relating to the supply of goods prepared by the Contractor or procured from other sources up to the date of termination for which the Contractor has received payment equivalent to the value thereof; and

19.4.4 handover those parts of the supplies manufactured by the Contractor up to the date of termination.

Upon termination pursuant to clause 19.4, the Vendor shall be entitled to be paid the full value on the Material(s) delivered in accordance with the Contract.

19.5 The Contractor shall not be released from any of his obligations or liabilities accrued under the Contract on termination. For the avoidance of doubt, the termination of the Contract in accordance with this clause shall neither relieve the Contractor of his accrued obligations for Warranty or his accrued liability to pay (liquidated) damages for Delay nor shall entitle him to reduce the value of Performance Security.

20 Sub letting and assignment:

The contractor shall not without prior consent in writing of the Purchaser, sublet, transfer or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever, provided nevertheless that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

21 **Dispute Resolution**:

Dispute or differences arising out or relating to this Order shall be resolved amicably by the parties. Failing such amicable resolution of dispute / differences either party may refer the matter to arbitration of a Sole Arbitrator to be appointed jointly by both the parties. The award of the Arbitrator shall be final, binding and conclusive on the parties. The venue for arbitration shall be Mumbai. The Arbitration proceedings will be governed and regulated by the provisions of Indian Arbitration and Conciliation Act, 1996 as amended from time to time and the rules framed there under.

22 Governing laws

This Contract shall be construed in accordance with and governed by the Laws of India without giving effect to any principle of conflict of law.

23 Jurisdiction

This Contract and the transaction contemplated herein shall be subject to the exclusive jurisdiction of the competent Courts in Mumbai only.

24 Limitation of Liability

Notwithstanding anything contained in the Contract, the Contractor's aggregate liability under this Contract shall be limited 100% of the Total order value. This shall however, exclude liability arising pursuant to clause 2.8- tax indemnity, clause 14- General Indemnity, clause 15- Indemnity against IPR, clause 25 – Confidentiality and liabilities arising due to wilful misconduct, gross negligence, third party claims and corrupt acts attributable to the Vendor.

25 Confidentiality:

The Vendor shall use the Confidential Information of the Purchaser only in furtherance of this Contract and shall not transfer or otherwise disclose the Confidential Information to any third party. The Vendor shall (i) give access to such Confidential Information solely to those employees with a need to have access thereto; and (ii) take the same security precautions to protect against disclosure or unauthorized use of such Confidential Information that the party takes with its own confidential information but, in no

event, shall a party apply less than a reasonable standard of care to prevent such disclosure or unauthorized use.

26 Consequential Damages:

Unless otherwise specified, neither Party shall be responsible for and nor shall be liable to the other Party for indirect/consequential losses and damages suffered by such Party including for loss of use, loss of profit whether such liability or claims are based upon any negligence on the part of the other Party or its employees in connection with the performance of the Purchase Order.

27 New Legislation (The Micro, Small and Medium Enterprise Development Act 2006)

a. This Act has been enacted and made effective from 2nd October 2006. The Interest on Delayed Payments to Small Scale and Ancillary Industrial Undertaking Act, 1993 is repealed.

b. Vendor is requested to inform the purchaser if vendor fall under The Micro, Small and Medium Enterprises Development Act, 2006 legislation and provide the purchaser, registration number and date to enable purchaser to take necessary care. The vendors are also requested to mention the same on their invoice / bill.

28 Relation between parties:

The Purchase Order shall be entered into on a principal-to-principal basis only. The Purchase order shall not be construed as a partnership or an association of persons. There is no agent and principal relationship between the parties. Each party shall be responsible for its own conduct. The Vendor shall ensure at all times that all the work carried out under this contract either by its own person or through any of its sub-Vendors shall be always done under its own direct supervision.

29 Environment / ISO 14001 Certification:

The Vendor to confirm whether their organization is ISO 14001 certified. If not, the Vendor must certify that the handling, use and disposal of their product / by-products conform to practices consistent with sound environmental management and local statutes. The Vendor shall ensure that all the wastes are disposed in environmental friendly way with strict compliance to applicable laws including adherence to MoEF guidelines with respect to disposal of batteries, lead waste, copper cables, ash, waste oil, e-waste etc which shall be disposed through MoEF approved parties only. The Vendor shall also be responsible to collect and recycle all the e-waste generated at the end of the product life cycle at its own costs and risks as per the MoEF guidelines/ orders.

30 Tata Code of Conduct

The Purchaser abides by the Tata Code of Conduct in all its dealing with stake holders and the same shall be binding on the Purchaser and the Vendor for dealings under this Purchase Order. A copy of the Tata Code of Conduct is available at our website: http://www.tatapower.com/aboutus/code-of-conduct.aspx. The Vendor is requested to bring any concerns regarding this to the notice of our Chief Ethics Officer on the e-mail ID: cecounsellor@tatapower.com.

31 Responsible Supply Chain Management:

The Purchaser is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy. The Vendor is required to comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations. The Purchaser encourages its Vendors/ Contractors/ Business partners to pay more attention to green design, green supply, green production, green logistics and green packaging in performing their business obligations.

The Vendor is required to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy.

A copy of the Responsible Supply Chain Management Policy along with Environment policy, Energy Conservation policy, Sustainability policy, Health & Safety policy and Human Rights policy is available at website: http://www.tatapower.com/sustainability/policies.aspx.

Vendor/Bidder is required to completely fill the attached "Supplier Sustainability Questionnaire" in support of their Green Supply Chain Management initiatives and submit the same with their offer.

The Owner recognizes that diversity in the workplace positively impacts business. The Owner is committed to help people from SC/ST background either by helping them to become entrepreneurs or by engaging workforce from SC/ST community under the contracts agreed herein. To encourage engaging SC/ST community, the owner may consider on the merit to incentivize the Contractor by paying additional 1% of the service contract portion if the number of SC/ST workforce engaged in the contract exceeds 30% of the total deployed strength and 2%, if the strength goes beyond 50%. While the Contractor will assist the workforce so engaged to become self-reliant in meeting the work expectation, the Owner may also volunteer its training resources to the extent possible to improve their employability. The Contractor shall maintain the proper documentation of such category of the workforce engaged and the owner may consider to pay the incentive after its verification.

The Owner may also consider extending price preference of 5% in the bid evaluation for an order value up to Rs.50 Lacs, provided the company is owned by a person from SC/ST community having minimum 50% holding in the company.

32 Vendor rating

You are requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Your performance with respect to the said factors will be taken into consideration for future business.

33 Vendor Feedback:

33.1 In this dealing Vendors feedback is important for the purchaser to improve its processes. If vendor have to report any grievance, problem or require any clarification, information, vendor is requested to contact purchaser at email ID: CC_CUSTOMERFEEDBACK@tatapower.com

33.2 Vendor is requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Vendor performance with respect to the said factors will be taken into consideration for future business.

34 Non-Waiver:

Failure of Purchaser or its representatives to insist upon adherence to any of the terms or conditions incorporated in the Contract or failure or delay to exercise any right or remedies herein or by law accruing, or failure to promptly notify the Vendor in the event of breach or the acceptance of or the payment of any Material(s) hereunder or approval of any design or Material(s) shall not release the Vendor and shall not be deemed a waiver of any right of Purchaser to insist upon the strict performance thereof or of any of its rights or remedies as to any such Material(s) regardless of when the Material(s) are shipped, received or accepted not shall any purported oral modification or revisions of the Contract by Purchaser or its representative(s) act as waiver of the terms hereof.

35 **Repeat Order**:

Purchaser may place the repeat order for 100% of ordered quantities within a span of 6 months from the date of issue of this Purchase Order & Vendor shall execute it at same rates, terms and conditions.

36 Severability

If any provision of this Contract is invalid, unenforceable or prohibited by law, this Contract shall be considered divisible as to such provision and such provision shall be inoperative and shall not be part of the consideration moving from any Party hereto to the others, and the remainder of this Contract shall be valid, binding and of like effect as though such provision was not included herein.

ESG FRAMEWORK FOR BUSINESS ASSOCIATES

Tata Power's Sustainability philosophy sits at the core of its Business Strategy. Tata Power Sustainability Model has an overarching objective of 'Leadership with care' with key elements of 'Care for the Environment'; 'Care for the Community'; 'Care for our Customers / Partners' and 'Care for our People'. These sustainability objectives encompass the Environmental, Social and Governance objectives driven as integrated elements.

Tata Power, together with its stakeholders is determined to achieve sustainable growth while creating shared value for all.
As a part of future ready roadmap, Tata Power has targeted following as our Environment, Social and Governance priorities:

- Being Carbon Net Zero before 2045
- Growing Clean capacity (80% by 2030)
- Customer centricity
- Becoming water neutral before 2030
- Achieving zero waste to landfill before 2030
- No net loss of biodiversity before 2030
- Positively impacting 80 million lives by 2027

In order to create a sustainable business ecosystem, Tata Power expects that all its Business Associates (BA) which includes its suppliers, vendors, consultants and service providers to align to its ESG and sustainability commitments.

Tata Power encourages improved efficiencies and scaling up of green initiatives through technology and innovation taking us farther on the journey of reducing carbon emissions and preparing the entire eco-system towards products and services that would have net positive impact on the environment and communities that we operate in.

The Vendors/ bidders wishing to associate with Tata Power are expected to share their own sustainability and ESG journey. We at Tata Power promote all Business Associates to have a sustainable procurement policy for their supplier and service providers to contribute to our integrated approach in achieving a sustainable supply chain. The BA is encouraged to carry out the assessment of their sub-contractors and sub-vendors on sustainability readiness so that they are aware of the expectation/ business requirement.

The Vendor/ Bidder shall fill-in the 'Environment, Social and Governance Compliance Screening Questionnaire for Business Associates' attached at Annexure-I and submit the same along with the Bid in Ariba online platform.

Responsible Supply Chain Management:

Tata Power is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy.
Tata Power Business Associate (BA) shall comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations.

Tata Power encourages its BA to focus on green design, green supply, green production, green logistics and green packaging in performing their business obligations. The BA is expected to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy (enclosed with this document as Annexure-II).

The BA is expected to:

- Strive towards Conservation of Energy, Water, Resources and optimize transportation of Men & Materials to minimize environmental impact and reduce carbon footprint.
- Carry out the assessment of materials used for construction, operation & maintenance, consumables and accordingly phase out those materials which are environmentally hazardous.
- Be cognizant that diversity in the workplace positively impacts business.
- Promote affirmative action by supporting people from SC/ ST background by engaging workforce from SC/ ST community under the contracts agreed herein.
- Share the commitment of 'No child labour', 'No forced labour', Non-discrimination on the basis of caste, colour, religion, gender, disability, maternity or pregnancy or any other factor unrelated to the requirements of the job
- Pay the wages or remuneration to the workforce, personnel deployed in compliance to all applicable laws and regulations.
- Provide its employees/ deployed labor with an employment environment that is free of physical or psychological harassment.
- Carry out the assessment of their Sub-contractors on their Sustainability Readiness so that they are aware of the above expectation/ standards
- To ensure usage of suitable package material which is more environmentally sustainable. Further the packing material shall be recycled to the extent possible. The material used for packing is expected to suit the mode of transport and to ensure its safe receipt at point of delivery.

Waste Disposal:

The BA is expected to follow best practices for disposal of waste, few of which are listed below:

- Have a detailed project plan that includes the waste management, segregation of all designated waste material (Recyclable/ Non-Recyclable), collecting, storing, disposing and transferring the same to pre-arranged facility/ destination in timely and safe manner as per environmental legislations. The project plan shall also include the innovative construction practice to eliminate or minimize waste, protect surface/ground water, control dust and other emissions to air and control noise.

- Have purchase policy to encourage the procurement of material with recycled and minimum packaging of goods during delivery and appropriate means for site-to-site transportation of materials to avoid damage and litter generation.

- Ensure that the residents living near the site are kept informed about proposed working schedule and timings/ duration of any abnormal noise full activity that is likely to happen.

- Ensure the regular maintenance and monitoring of vehicles and equipment for efficient fuel use so that emissions and noise are within acceptable limits to avoid air pollution.

Water Management:

The BA is expected to follow best practices for water management, few of which include a management and monitoring system for water withdrawals and consumption, procedures to reduce water usage or reuse/recycle water, and pretreatment of wastewater before disposal.

Compliance to Law:
The BA shall adhere to responsible business practices and comply with the provision of all the Statutory Acts Applicable. Special attention of the BA is drawn towards the compliance of provision of the following statues: (along with the latest amendments/additions, as applicable):

- The Child Labour (Prohibition and Regulation) ACT, 1986.
- The Contract Labour (Regulation and Abolition) ACT, 1970.
- The Employee's Pension Scheme, 1995.
- The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- The Employees State Insurance Act, 1948.
- The Equal Remuneration Act, 1976.
- The Industrial Disputes Act, 1947.
- The Maternity Benefit Act, 1961.
- The Minimum Wages Act, 1948.
- The Payment of Bonus Act, 1965
- The Payment of Gratuity Act, 1972.
- The Payment of Wages Act, 1936.
- The Shops & Establishment Act, 1954.
- The Workmen's Compensation Act, 1923.
- The Employer's Liability Act, 1938.
- and any other applicable statutory act

Social Accountability (SA 8000):

Tata Power expects its BAs to follow guidelines of SA 8000:2014 on the following aspects

- Child Labour
- Forced or Compulsory Labour
- Health & Safety
- Freedom of Association & Right to Collective Bargaining
- Discrimination
- Disciplinary Practices
- Working Hours
- Remuneration
- Management System

Health and Safety

The BA is expected to ensure the health and safety of his and his Sub-contractor’s staff and labour. The BA shall, in collaboration with and according to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The BA shall maintain records and make reports concerning health, safety and welfare of persons deployed, and damage to property, as the Owner’s Representative may reasonably require. The BA shall be responsible for the medical treatment / hospitalization of his and his Sub-contractor’s staff/ labour.

The BA shall appoint a qualified Safety officer at the Site to be responsible for maintaining the safety, and protection against accidents, of all personnel on the Site. Such Safety officer shall have the authority to issue instructions and take protective measures to prevent accidents.

The BA shall comply in toto with the Tata Power's Contractor Safety Terms & Conditions, Health Safety & Environment Manual while working on Tata Power Site/ Services/ Contracts.

Grievance Mechanism

The BA is expected to have grievance procedures that allow stakeholders to anonymously bring environmental and/or work-related violations and/or concerns to the attention of management. In addition, the BA is expected to have procedures for examining reports of environmental and/or work-related violations or concerns and/or privacy complaints.

Data Protection

The BA is expected to have a formal process to address data security or privacy issues.

ANNEXURE-I

Sr. No.	Question Description	Response (Y/N)	Remarks
Organization			
1	Does your Company have Sustainability Policy at Organization Level? If Yes, Please attach		
2	Do you have sustainable procurement policy in place for your own suppliers? If Yes, Please attach		
3	Does your company do regular assessment of its suppliers on ESG parameters?		
4	Are there ESG risks, or negative impacts identified in your supply chain		
Governance			
1	Is diversity taken into consideration when appointing board members/ senior management? Do you have an independent director/s?		
2	Has your company taken initiatives to ensure ethical practices at workplace? Please share the details, Policies etc.		
3	Does your company have a formal process to address data security or privacy issues? Please share the details, Policies etc.		
4	Does your company have grievance mechanism for stakeholder issues and track resolution?		
Environment/ Planet			
1	Does your company have Environmental Policy? If Yes, Please attach		
2	Do you have a formal process for waste management including solid wastes, liquid wastes and hazardous waste?		
3	Does your company track greenhouse gas emission? Also, what percentage of own consumption comes from the renewable energy?		
4	Does your company have a formal process for water management including monitoring of water consumption and withdrawals, and if applicable, pretreatment of wastewater?		
Green Technology/ Innovation			
1	Are your facility/ Product/ Services provided by you is based on green design, green production, green packaging or green logistics considerations? Please elaborate.		
2	Do your products or services have any environmental or social features or benefits (e.g. environmental/energy certification, ecolabels, fair trade certification, etc.)?		
Social/ People			
1	Does you facility/ Company have written personnel policies in place Are you an equal opportunity employer?		
2	Please describe any formal programme / campaign in place to promote company involvement with the community (volunteering, etc.). What is the percentage of profit spend on community activities?		
3	Does your company have a written Health & Safety Policy or Program? If Yes, Please attach		
Certifications: Does your company have following certifications (valid till date-please mention validity)			
1	ISO9001 accreditation		
2	SA8000 or equivalent		
3	ISO 14001 certification		
4	ISO 18001/45001 or equivalent		
5	ISO/IEC 27001 or equivalent		
6	Any Other (Please specify)		

Signature

Business Associate Name

ANNEXURE-II

CORPORATE SUSTAINABILITY POLICY

At Tata Power, our Sustainability Policy integrates economic progress, social responsibility and environmental concerns with the objective of improving quality of life. We believe in integrating our business values and operations to meet the expectations of our customers, employees, partners, investors, communities and public at large

- We will uphold the values of honesty, partnership and fairness in our relationship with stakeholders
- We shall provide and maintain a clean, healthy and safe working environment for employees, customers, partners and the community
- We will strive to consistently enhance our value proposition to the customers and adhere to our promised standards of service delivery
- We will respect the universal declaration of human rights, International Labour Organization's fundamental conventions on core labour standards and operate as an equal opportunities employer
- We shall encourage and support our partners to adopt responsible business policies, Business Ethics and our Code of Conduct Standards
- We will continue to serve our communities:
    - By implementing sustainable Community Development Programmes including through public/private partnerships in and around our area of operations
    - By constantly protecting ecology, maintaining and renewing bio-diversity and wherever necessary conserving and protecting wild life, particularly endangered species
    - By encouraging our employees to serve communities by volunteering and by sharing their skills and expertise
    - By striving to deploy sustainable technologies and processes in all our operations and use scarce natural resources efficiently in our facilities
    - We will also help communities that are affected by natural calamities or untoward incidence, or that are physically challenged in line with the Tata Group's efforts

The management will commit all the necessary resources required to meet the goals of Corporate Sustainability.

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER
Lighting up Lives!

Supplier Code of Conduct

Tata Power follows the Tata Code of Conduct (TCoC) and the Whistle blower Policy and expect all its Suppliers to adhere to the same principles. **"Supplier"** here means any business, company, corporation, person or other entity that provides, sells or seeks to sell, any kind of goods or services to Tata Power, including the Supplier's employees, agents and other representatives.

Tata Code of Conduct- (TCoC): https://www.tatapower.com/pdf/aboutus/Tata-Code-of-Conduct.pdf

Whistle Blower Policy: https://www.tatapower.com/pdf/aboutus/whistle-blower-policy-and-vigil-mechanism.pdf

Anti-Bribery & Anti-Corruption Policy: https://www.tatapower.com/pdf/aboutus/abac-policy.pdf

The suppliers are expected to adhere to the following Do's and Don'ts:

Do's

1. The Suppliers shall be committed to supplying products and services of high quality that meet all applicable standards and laws, including product packaging, labelling and after-sales service obligations.
2. Comply with all applicable laws and regulations, both in letter and in spirit, in all the territories in which it operates.
3. Strive to provide a safe, healthy and clean working environment for its employees.
4. Strive for environmental sustainability, particularly with regard to the emission of greenhouse gases, consumption of water and energy and the management of waste and hazardous materials.
5. The Supplier shall represent our company (including Tata brand) only with duly authorised written permission from our company.
6. Safeguard the confidentiality on the use of intellectual property, information and data of the Company.
7. Gifts and hospitality given or received should be modest in value and appropriate as per Company Policy.
8. The assets of Tata Power shall be employed primarily and judiciously for the purpose of conducting the business for which they are duly authorised.
9. All actual or potential conflicts due to financial or any other relationship with a Tata Power employee shall be disclosed.

Don'ts

1. The Supplier shall not make unfair or misleading statements about the products and services of competitors.
2. Children shall not be employed at workplaces.
3. Forced labour shall not be used in any form.
4. The Suppliers shall neither receive nor offer or make, directly or indirectly, any illegal payments, remunerations, gifts, donations or comparable benefits that are intended, or perceived, to obtain uncompetitive favours for the conduct of its business with Tata Power.

Reporting Violations

The Supplier shall notify the Company regarding any known or suspected improper behaviour of other suppliers or employees relating to its dealings with Tata Power, by email to: cecounsellor@tatapower.com. The same can also be raised through our 3rd party ethics helpline facility:

Toll-free Number	1800 267 4065
Email	tatapower@tip-offs.in
Website & Chatbot	www.tatapower.tip-offs.in
Postal address	Attn to: Mr. Puneet Arora, Deloitte Touch Tohmatsu India LLP, 6 floor, AIPL Business, Sector 62, Gurugram, Haryana 122102

CYBERSECURITY COMPLIANCE

The Vendor unconditionally undertakes, for the entirety of the contract term and the warranty / support period, to comply with the cybersecurity obligations set out below. Acceptance of this clause is a condition precedent to award; non-compliance constitutes a material breach.

1. Universal Obligations — applicable to all Vendors and all supplies

(a) ISO/IEC 27001:2022 certification covering the supply scope is maintained current; where the supply includes vendor develop software, firmware, or a vendor operated software solution, an independent third-party VAPT of the offered solution has been conducted within the last 12 months (this VAPT requirement does not apply to distributors reselling OEM hardware such as laptops, switches, routers, and similar IT/OT and networking equipment's).

(b) No private Wi-Fi, personal hotspots, 4G/5G modems, unmanaged switches, or unauthorised broadband shall be deployed at Tata Power sites. All remote access shall be conducted exclusively through Tata Power's approved Secure Remote Access (SRA) solution and processes defined.

(c) MFA is enforced for privileged and remote access; integration with enterprise IAM (SAML 2.0 / AD / LDAP) is supported; RBAC under least privilege is applied; dedicated named accounts are used (no shared Vendor credentials); hardcoded or default credentials are prohibited in production; data is encrypted at rest using AES-256 (or equivalent) and in transit using TLS 1.2 or higher, with SSL / TLS 1.0 / 1.1 disabled.

(d) All operational, configuration, and diagnostic data remains the sole property of Tata Power; the supplied solution contains no hidden telemetry, backdoors, undisclosed data collection, or background cloud synchronisation.

(e) For IT solutions and applications, security patches shall be provided within: Critical (CVSS ≥ 9.0) 15 days; High (7.0–8.9) 30 days; Medium (4.0–6.9) 60 days; Low (< 4.0) 90 days. For OT solutions, security patches for vulnerabilities with a CVSS score above 8.0 shall be provided to Tata Power as and when released by the OEM / Vendor, after due testing in a representative environment to prevent operational instability. Zero-Day interim mitigation is issued within 24–48 hours of internal discovery. Not less than 12 months' written notice of any EOL / EOS milestone shall be given.

(f) Tata Power shall be notified of any confirmed or suspected security breach within 4 hours of discovery, with full cooperation for CERT-In's 6-hour mandate.

2. Conditional Obligations — applicable where the supply category applies

(a) IT Software / Firmware (where the supply includes Vendor-developed software or firmware): A documented SSDLC with SAST, DAST, and SCA gates is operated; a machine-readable SBOM is delivered identifying all components, versions, licences, and known CVEs at delivery.

(b) IT Hardware & Endpoints (servers, workstations, laptops, network equipment): EDR / AV with 3 years of free updates is bundled, or formal compatibility with Tata Power's chosen EDR / AV with central manager is declared; Windows endpoints are hardened to CIS Benchmark Level 1; BIOS / UEFI password protection is enabled; boot-from-external-media is disabled; USB ports are lockable; unused ports, services, and default accounts are disabled and documented; shipments arrive in tamper-evident packaging.

(c) Operational Technology / ICS (PLCs, RTUs, IEDs, SCADA, EMS, DCS, HMIs, OT firewalls, MES, SIS, engineering workstations and OT endpoints/computers): IEC 62443-4-1 and 4-2 compliance is held or independently assessed; architecture aligns with the Purdue Model with a Communication Matrix; MES-to-OT exchanges traverse approved OT firewalls (no direct IT-to-Level 1 / 2 connectivity); Secure Boot with cryptographic firmware validation; offline patching via removable media or local update server (no internet dependency); SIS is physically and logically segregated from BPCS (no shared credentials, networks, or power); secure industrial protocols supported (DNP3 SAv5, IEC 61850 with TLS, OPC-UA SignAndEncrypt) — Telnet, FTP, SNMP v1 / v2c, unencrypted HTTP, rsh, rlogin are not used on any OT segment; application whitelisting enabled on HMIs by default; all OT project files (PLC / DCS / RTU programs, HMI projects, SCADA exports, IEC 61850 SCL / CID / SCD files, network device configs, SIS files) are delivered in native and vendor-agnostic formats at handover and refreshed after every configuration change. Cybersecurity compliance during FAT and SAT is a condition of acceptance; non-conformance entitles Tata Power to reject equipment without commercial impact, with any re-FAT / re-SAT at Vendor's cost.

(d) Cloud / SaaS (solutions hosted outside Tata Power's infrastructure): A current SOC 2 Type II report or ISO 27017 / 27018 certification covers the offered service; all data processing, storage, and transmission occurs exclusively within India unless explicitly approved in writing by the Tata Power CISO and Legal teams.

(e) Personal Data Processing (any solution processing personal data on behalf of Tata Power, regardless of hosting model): The Digital Personal Data Protection Act, 2023 is complied with; a Data Processing Agreement defining data categories, retention, deletion, sub-processor disclosure, and the Vendor's processor role shall be executed prior to go-live.

3. Remedies, Indemnity, and Survival

(a) Any false, misleading, or materially incomplete declaration, or any material non-compliance with this clause, shall entitle Tata Power to: (i) disqualify the bid; (ii) terminate any awarded contract for material breach; (iii) forfeit bid security and performance guarantees; (iv) blacklist the Vendor for a period determined by Tata Power; and (v) pursue such other legal recourse, civil or criminal, as may be available.

(b) The Vendor shall indemnify Tata Power against losses, penalties, damages, regulatory fines, and reasonable legal costs arising from a security breach attributable to the Vendor's negligence or non-compliance with this clause.

(c) Sub-clauses 1(d), 1(f), 2(d), and 2(e) shall survive expiry or termination of the contract for the period during which Tata Power data remains in the Vendor's custody, or any obligation remains capable of giving rise to a cause of action, whichever is longer.

The Tata Power Company Limited is hereunder referred to as the "Owner" or "Company". The person, firm or company offering the services, the subject of this order is referred to as "Contractor". The subject of this order is hereinafter referred to as the "Work".
"Sub-Contractor" means any person named in the Contract as a Sub-contractor, sub-vendor, manufacturer or supplier for a part of the Works or any person to whom a part of the Works has been subcontracted and the legal successors in title to such Person, but not any assignee of such Person.

The Contract shall mean the contract as derived from the following:

1. Work Order (with 'Commercial Notes' and Annexures to the Work Order referred thereon)
2. Scope of Work.
3. General Terms & Conditions - Service

The documents including all reference document (s) and Annexures forming the Contract are to be read together as a whole and are to be taken as mutually explanatory, provided however, in the event of any inconsistency or discrepancy between the aforementioned documents, the order of precedence in interpretation of the documents shall be as set out above. For the avoidance of doubt, it is clarified that the terms set forth in the Work Order (with 'Commercial Notes' and Annexures to the Work Order referred thereon) shall take precedence over the terms set out in the Scope of Work, which shall in turn take precedence of the terms set out in the General Terms & Conditions – Service.

1. Contractor's obligation:

1.1 Contractor warrants that it is a competent, qualified and experienced contractor, equipped, organised and financed to perform and complete the services in the operating area in an efficient and professional manner and capable of meeting all the requirements of the Contract.

1.2 The Contractor has the overall responsibility of executing the contract, conducting Planning, Job Scheduling, Maintenance Planning, Maintenance Job Scheduling, executing the Work and maintenance jobs as per the Scope of work & schedule.

1.3 Except to the extent that it may be legally or physically impossible or create a hazard to safety, the Contractor shall comply with the Owner's representative(s) instructions and directions on all matters relating to the Work.

1.4 Contractor shall at all times have full responsibility for control of the Equipment and for the direction and supervision of operations being carried out under the Contract.

1.5 In the performance of the Work, Contractor shall be and act as an independent Contractor fully responsible and accountable for the proper execution of its responsibilities, obligations and liabilities under this Contract and for its own acts and the acts of its Sub-Contractors and the Personnel. Owner's supervision, examination or inspection of the (performance of the) Work or omission to carry out the same shall not be construed in any manner whatsoever as relieving Contractor from its responsibilities, obligations or liabilities under this Contract.

1.6 Contractor shall submit list of tools & tackles with details of make, year of manufacturing, valid certification to the Project Manager/ User for their approval.

Project Manager may during the execution of project inspect & verify that the tools & tackles are as per the qualification requirements approved by him and will have right to seek replacements in case of any discrepancies. The Contractor shall always comply with such directives.

1.7 Contractor shall engage Tata Power Skill Development Institute (TPSDI) certified labour force at the site for execution of the job. Requirement & fees for TPSDI certification shall be as per Company Policy.

1.8 Contractor shall take full responsibility for the protection and security of Owner's materials and equipment while such materials and equipment are temporarily stored in Contractor's facility or otherwise in Contractor's custody.

1.9 All notices, instructions, information, and other communications given by the Contractor to Owner under the Contract shall be given to the Order Manager/ Owner's representative, except as otherwise provided for in this Contract.

1.10 The Contractor shall make its own arrangements for movement of personnel and equipment, within and outside the sites / units / offices at the various locations covered by the Contract.

1.11 The Contractor shall acquire in its name all permits, approvals, and/or licenses from all local, state, or national government and other statutory authorities and/or public service undertakings that are necessary for the performance of the Contract.

1.12 Neither the Contractor nor its personnel shall during the term of this Contract, engage in any business or professional activities in India/abroad which would conflict with the activities assigned to them under this Contract.

2. Service Warranties:

Contractor warrants that all services performed for or on behalf of Owner will be performed in a competent,

workmanlike manner and shall be free from faults and defects. Said warranties shall be in addition to any warranties of additional scope given by Contractor to Owner. None of said warranties and no other implied or express warranties shall be deemed is claimed or excluded unless evidenced by a change notice or revision issued and signed by Owner's authorized representative.

3. Compliance of Local Laws:

Contractor shall be responsible and shall comply with the provision of all the Statutory Acts Applicable. Special attention of the Contractor is drawn towards the compliance of provision of the following statues: (along with the latest amendments/additions, as applicable):

a) The Child Labour (Prohibition and Regulation) ACT, 1986.
b) The Contract Labour (Regulation and Abolition) ACT, 1970.
c) The Employee's Pension Scheme, 1995.
d) The Employee's Provident Funds and miscellaneous provisions Act, 1952.
e) The Employees State Insurance Act, 1948.
f) The Equal Remuneration Act, 1976.
g) The Industrial Disputes Act, 1947.
h) The Maternity Benefit Act, 1961.
i) The Minimum Wages Act, 1948.
j) The Payment of Bonus Act, 1965
k) The Payment of Gratuity Act, 1972.
l) The Payment of Wages Act, 1936.
m) The Shops & Establishment Act, 1954.
n) The Workmen's Compensation Act, 1923.
o) The Employer's Liability Act, 1938.
p) and any other applicable statutory act

Site Specific requirements shall be as Annexure at I. The compliance to these Site Specific requirements shall not absolve the Contractor of its obligation to comply with the Owner's Contractor Safety Management Policy.

4. Owner's Obligation:

4.1 The order manager (As specified in the 'Commercial Notes') shall have the authority to represent Owner on all day-to-day matters relating to the Contract or arising from the Contract. All notices, instructions, orders, certificates, approvals, and all other communications under the Contract shall be given by the order manager, except as otherwise provided for in this Contract. The order manager may appoint the Engineer-In-Charges for different areas for monitoring the work progress, inspections and signing of bills.

4.2 Owner shall ensure the availability of site access, all information and/or data to be arranged/ supplied by Owner to the Contractor for execution of the Work . The terms on which the Contractor shall be allowed access to the site shall be specified by the Owner prior to commencement of the execution of the Work and thereafter shall be governed in accordance with such policies as the Owner may provide in writing to the Contractor from time to time.

5. **Contractor's/ Sub-contractor's employees**:

5.1 The Contractor shall engage appropriately qualified persons to provide the services with the prior approval of Owner. Owner may withhold such approval for any reason whatsoever.

5.2 The Contractor hereby represents and warrants that:

i) the personnel are duly qualified, and are, and will remain, sufficiently qualified, careful, skilful, diligent and efficient to provide the services to Owner; and
ii) the Services will be rendered carefully, skilfully, diligently and efficiently, and to the professional standard reasonably expected by Owner of a contractor qualified and experienced in providing services substantially the same as the Services.

5.3 The Contractor must ensure that the Contractor's personnel conduct themselves in a proper manner and comply with the procedures and all policies, regulations and directives of Owner including any occupational, health and safety policies and the relevant prevailing laws and regulations in the Country of operations and specifically in the area where Work is being executed.

5.4 Owner may inform the Contractor to immediately remove Contractor's personnel from the relevant premises in the event of misconduct or incompetence on the part of the Personnel. The Contractor shall at all times remain liable for all acts and/or omissions of its Personnel.

5.5 It is made clear that no relationship of Owner and employee is created between Owner and the Contractor's resident engineers, employees and no claim for employment of any such personnel shall be tenable or entertained.

6. Title of Property:

6.1 Unless otherwise provided in this order or agreed to in writing, property of every description including but not limited to all tooling, tools, equipment and material furnished or made available to Contractor, title to which is

in Owner, and any replacement thereof shall be and remain the property of Owner. Such property other than material shall not be modified without the written consent of Owner. Such property shall be plainly marked or otherwise adequately identified by Contractor as being owned by Owner and shall be safely stored separately and apart from Contractor's property.

6.2 Contractor shall not use such property except for performance of work hereunder or as authorized in writing by Owner. Such property while in Contractor's possession or control shall be listed in writing and kept in good condition, shall be held at Contractor's risk, and shall be kept insured by Contractor, at its expense, in an amount equal to the replacement cost with loss payable to Owner. To the extent such property is not material consumed in the performance of this order, it shall be subject to inspection and removal by Owner and Owner shall have the right of entry for such purposes without any additional liability whatsoever to Contractor. As and when directed by Owner, Contractor shall disclose the location of such property, prepare it for shipment and ship it to Owner in as good condition as originally received by Contractor, reasonable wear and tear excepted.

7. Work Completion schedule:

Contractor shall plan and execute the Work in accordance with a detailed schedule mutually agreed upon by the Parties (Owner and Contractor).

8. Contract Price and Payment:

8.1 The Contract Price shall be a firm & fixed Contract Value for the Work inclusive of all the taxes, levies & duties and shall remain firm till the validity of this contract.

8.2 Unless Specifically stated elsewhere in the contract, the Contractor is solely liable for payment of , and warrants that it will pay, or ensure the payment of all taxes imposed, assessment made in relation to the Work.

8.3 An amount as stated in the table below shall be retained towards Contractor's safety performance against every RA bill:

Contract Value	Retention Amount (%)
Upto Rs. 10 lakhs	2.5
Above Rs. 10 lakhs and below Rs. 50 lakhs	2
Above 50 lakhs and upto Rs. 10 Crores	1.5
Above Rs. 10 Crores	1

The above mentioned safety retention shall be over and above any other retentions/ deferred payments as may have been specifically agreed in the Contract.

8.4 For Contract Price Rs. 1 crores or above and Contract Completion Schedule 12 months or more, the above safety retention will be released half yearly against the Safety Performance Score (methodology for evaluation enumerated in the Safety Terms & Conditions attached as Appendix to this General Terms & Condition) which will be evaluated by the Order Manager every month. For all other contracts, the above said safety retention shall be released along with the final settlement only at the end of the contract period.

8.5 The Owner shall have the right to stop any work which in its opinion is not meeting the safety standards/ guidelines of the Owner and good engineering practice. The Contractor shall not be eligible for and shall not be granted any extension in Completion Schedule due to such stoppage of work by the Owner.

8.6 The above retention towards safety shall not absolve the Contractor of its liabilities including statutory liabilities towards safety violations, injury or death (whether by accident or otherwise). An amount between Rs. 5 to 50 lakhs as deemed appropriate by Owner's appointed Committee for incident investigation and/ or as determined by statutory authorities (whichever higher), will be payable by the Contractor in case of such severe incidents of injury leading to loss of property or partial/ permanent disablement (e.g. loss of limb/s, vision etc.) or death.

8.7 Notwithstanding anything else stated in the Contract, the Contract shall be liable for termination without any notice and without recourse to Owner in case of three (3) or more severe safety violations. There shall be no termination fees/ compensation payable to Contractor for such termination.

8.8 In case the Contractor achieves 100% on the Safety Performance Score, the Contractor shall be awarded a discretionary bonus of 1% of invoiced value subject to a maximum of Rs. 50 lakhs towards Safety Performance.

8.9 Payment shall be released within 60 days of submission of error free invoice with supporting documents duly certified by the Order Manager/ Engineer-in-Charge after deducting taxes at source as prescribed under the applicable law, income – tax or other deductions under the state value added tax laws . If such payment release

day falls on a holiday of Owner, payment will be released on the next working day. Against deduction of statutory taxes, tax deduction certificates where ever applicable shall be issued as per the applicable provisions of the statute. The Order Manager may recover any amount wrongly paid in excess in any previous bills certified by him.

8.10 *Mode of Payment*: All payments shall be made direct to the Contractor or his authorized representative in the shape of RTGS or Electronics Transfer method, on certification of the Order Manager/Engineer-in-Charge and on compliance of contractual terms & conditions.

9. **Taxes and Duties:**

9.1 The Contract Price shall be inclusive of all taxes, duties, including but not limited to Customs duty, GST or any local taxes, levies imposed by State/Central/Local governments.

9.2 Taxes as mentioned in the Contract Price or Price Schedule shall be paid to the contractor subject to the Contractor complying with all the statutory requirements and furnishing the relevant documents including error free invoices containing detailed break up of the taxes.

9.3 The tax invoices should contain the details to comply with the GST Law. The supplier shall:

i) Furnish (electronically) and communicate to the Owner, the details of Goods or Services supplied by the 10th of the month succeeding the said tax period,
ii) Upon discovery of any discrepancy, rectify it and shall pay the tax and interest thereof,
iii) Furnish the returns (electronically), for the inward and outward supplies of Goods and/or Services, before the specified dates as per the GST Law,
iv) Communicate the tax paid, credits etc. as and when credited.
v) The Invoice should clearly state the description of the goods, quantity, sale price, tax %, and tax amount;
vi) The Invoice should be signed by an Authorized Signatory.

Bills/Invoices in the name of The Tata Power Company Ltd. with packing lists in triplicate shall be forwarded along with the equipment.

Contractor to furnish GST Registration no. in all invoices as well as Purchaser's (Tata Power's) GST no.

9.4 However the payment of tax shall be restricted to the total amount as indicated in the price schedule.

9.5 Any statutory variation in duties, levies or taxes if applicable and specified in this Contract till the scheduled date for completion of Work and limited to direct invoices of the Contractor shall be to the account of Owner. The Contractor shall have the obligation to provide the necessary documentary evidence / supporting by way of gazetted notifications etc. to prove the change in such levies or taxes between the due date of submission of the Bid and the scheduled date of completion of work to claim the difference.

9.6 The Contractor shall pass on to the Owner all the benefits of either reduction in tax rates, exemptions, concessions, rebate, set off, credits etc. or introduction of new tax rates exemptions, concessions, rebate, set off, credits etc. pertaining to all taxes, duties, imposts, fees and levies in respect of the supplies of Goods or performance of obligations under the contract. This would specifically include reduction of tax rates as a result of statutory changes or judicial rulings.

9.7 Any other taxes, levies and duties not mentioned in Contract Price or Price Schedule but applicable as per any statute (s) or introduction (omission) of new taxes, levies and duties shall be deemed to be included in the Contract Price and shall be to the account of the Contractor.

9.8 For facilitating availment of a credit, set-off, rebate, drawback or like benefit available to the Owner, the Contractor will facilitate the Owner by providing the necessary documentary and/or procedural support. In any process of assessment or re-assessment, of taxes payable by the Owner,

9.9 The Contractor shall bear and pay all the costs, liabilities, levies, interest, penalties in respect of non-compliances of any legal requirements as per various statutory provisions. The contractor shall keep the owner indemnified at all times from any tax liability, interest, penalties or assessments that may be imposed by the statutory authorities for non-compliances or non-observation of any statutory requirements by the Contractor.

9.10 All formalities required under statutes, for availing any concessions under relevant tax laws shall be adhered to by the Contractor.

9.11 Deduction at source: Recovery at source towards income tax calculated at the rate prescribed from time to time under the Income Tax Act 1961 and other relevant sections of Income Tax Act shall be made from the bills of the Contractor and the amount so recovered shall be

deposited with the Income Tax Department. Necessary TDS certificate to this effect will be issued to the Contractor in the prescribed pro-forma.

9.12 If any other taxes / duties / cess etc are to be recovered at source as per government regulations / Legislation from time to time, the same shall be recovered from the bills payable to the Contractor. Necessary receipt to this effect will be issued to the Contractor in this regard as per the applicable legislation.

10. Contract Performance Guarantees (If applicable)

The Contractor shall within 15 days of issuance of this Order/Contract furnish an unconditional irrevocable bank guarantee duly stamped, strictly as per the prescribed format of Owner from any nationalized bank or any scheduled bank having a branch in Mumbai and approved by the Owner for a sum equivalent to 10% of the Total Contract Price valid for the Contract Period and with a claim period of not less than 6 months from the completion of Contract Period. The issuing bank should be advised to send a direct confirmation of issue of bank guarantee to Owner.

In case the Contractor fails to furnish the requisite Bank Guarantee as stipulated above, then the Owner shall have the option to cancel the Contract besides other contractual remedies.

11. Price Reduction:

11.1 In case the Contractor fails to deliver the service/ Complete the work as per the agreed Completion Schedule including intermediate milestones (if applicable), the Owner shall recover from Contractor, as ascertained and agreed Liquidated Damages, and not by way of penalty, a sum equivalent to 1% of the Contract Value per week of delay. The Liquidated Damages referred above may be recovered by the Owner as set off against any amounts payable by the Owner to the Contractor or in any other manner in accordance with applicable laws.

11.2 The overall cap on liquidated damages shall be limited to 10% of the Contract Price.

12. Insurance

12.1 The Contractor agrees to indemnify and protect Owner against all liability, claims or demands for injuries or damages to any person or property growing out of the performance of this order/ Contract.

12.2 The Contractor further agrees to furnish evidence of insurance showing that Contractor has and will maintain adequate insurance coverage during the life of this Contract/ order in the opinion of Owner, including but not limited to comprehensive general liability insurance. Such evidence of insurance must set forth the name of the insurer, policy number, expiration date, and limits of liability. Compliance by Contractor with insurance requirements does not in any way affect Contractor's indemnification of Owner under Indemnification clause

13. Indemnification:

The Contractor shall indemnify, save harmless and defend the Owner and keep the Owner indemnified from and against any and all claims, costs, liabilities (financial), litigations, compensations, judgments, expenses or damages (including attorney's fees and other related expenses) arising out of any breach or alleged breach of any of the conditions of this Contract including compliance to statutory laws of provisioned under clause 3, performance of the obligations hereunder, or any representation or misrepresentation made by the Contractor or by any third party in respect of death or bodily injury or in respect to loss or damage to any property with regard to the subject of this Contract.

14. Indemnity against IPR:

The equipment, system, drawings, and other materials that shall be supplied against the Contract will become the Owner's property. Without limitation of any liability of whatsoever nature, the Owner shall be indemnified and kept indemnified against any claim for infringement or breach of any of the statues, rules & regulations by the use of or sale of any article or material supplied by the Contractor. The indemnity shall include any infringement of patent, trade mark, design, copyright or other property rights whether in Country of Origin, or elsewhere resulting from the Contractor's design, manufacture, use, supply or re-supply & would also cover use or sale of any article or material supplied by the Contractor to the Owner under the Contract. The Indemnity shall cover any claim/action taken by a third party either directly against the Owner or any claim/action made against the Contractor & where under the Purchaser is made liable. The Indemnity shall be for losses, damages, and costs including litigation costs, attorney fees etc incurred by the Owner in relation to the Contract.

15. Free Issue Material:

Wherever contracts envisage supply of Free Issue Material (FIM) by the Owner to the contractor for fabrication/ use in service performance, such Free Issue Material shall be safeguarded by an insurance policy to be provided by the Contractor at his own cost for the full value of such materials and the insurance policy shall cover the following risks specifically and shall be valid for six months beyond the Contract Validity date :

RISKS TO BE COVERED: Any loss or damage to the Owner's materials due to fire, theft, riot, burglary,

strike, civil commotion, terrorist act, natural calamities etc. and any loss or damage arising out of any other causes such as other materials falling on Owner' s materials.
The amount for which insurance policy is to be furnished shall be indicated in the respective Contract.

Free Issue material (FIM) will be issued to the Contractor only after receipt of the Insurance Policy from the Contractor. The contractor shall arrange collection of the FIM from the Owner's premises and safe transportation of the same to his premises at his risk and cost. Notwithstanding the insurance cover taken out by the Contractor as above, the Contractor shall indemnify the Owner and keep the Owner indemnified to the extent of the value of free issue materials to be issued till such time the entire contract is executed and proper account for the free issue materials is rendered and the left over/surplus and scrap items are returned to the Owner. The contractor shall not utilize the Owner's free issue materials for any job other than the one contracted out in this case and also not indulge in any act, commission or negligence which will cause/result in any loss/damage to the Owner and in which case, the Contractor shall be liable to the Owner to pay compensation to the full extent of damage/loss. The Contractor, shall be responsible for the safety of the free issue materials after these are received by them and all through the period during which the materials remain in their possession/control/custody. The Free issue materials on receipt at the Contractor's works shall be inspected by them for ensuring safe and correct receipt of the material. The contractor shall report the discrepancies, if any, to the Owner within 5 days from the date of receipt of the material. The contractor shall take all necessary precautions against any loss, deterioration, damage or destruction of the FIMs from whatever cause arising while the said materials remain in their possession/custody or control. The free issue materials shall be inspected periodically at regular intervals by the Contractor for ensuring safe preservation and storage, the Contractor, shall also not mix up the materials in question with any other goods and shall render true and proper account of the materials actually used and return balance remaining unused material on hand and scrap along with the final product and if it is not possible within a period of one month from the date of delivery of the final product/ completion of Service covered by this Contract. The Contractor shall also indemnify the Owner to compensate the difference in cost between the actual cost of the free issue material lost/damaged and the claim settled to the Owner by the insurance company.

16. Relation between parties:

The Contract shall be entered into on a principal-to-principal basis only. The Contract shall not be construed as a partnership or an association of persons. There is no agent and principal relationship between the parties. Each party shall be responsible for its own conduct. The Contractor shall ensure at all times that all the work carried out under this contract either by its own person or through any of its sub-Vendors shall be always done under its own direct supervision.

17. Safety:

Contractor shall comply with all legal and statutory provisions including all rules and regulations pertaining to Safety, Health and the Environment and will be responsible for all legal liabilities arising due to any of their acts or of their personnel.

The Contractor shall comply with the Owner's Contractor Safety Policy and Safety Terms and Conditions. Any misconduct and/ or violation with respect to the Owner's Contractor Safety Policy and Safety Terms and Conditions or any other legal and statutory provisions pertaining to Safety, Health and Environment shall be dealt with as per the Safety Terms and Conditions.

Prior to commencement of any work at site Contractor shall submit an undertaking in writing to adhere to and comply with all the provisions of Owner's Contractor Safety Code of Conduct.

The Contractor shall have a valid ISO 14001/ OHSAS certification. In absence of the same, the Contractor shall obtain the same within 6 months from the date of the Effective Date of Contract.

18. Suspension of Work

Owner may instruct Contractor at any time to suspend performance of the Work or any part thereof with a notice of 7 days for whatever reason. Provided Contractor is not in default under this Contract subject to Articles 1 and 5 inclusive, the Contractor shall be paid a mutually agreed fee, if any, necessarily incurred by Contractor as a direct consequence thereof of suspension and the Project Completion Schedule may be revised accordingly.

Without prejudice to any other rights Owner may have under this Contract or at law if Contractor is in default under this Contract, Owner may instruct Contractor to suspend performance of the Work or any part thereof by giving 7 days notice till such default has been corrected to the satisfaction of Owner. Also Liquidated Damages in accordance with Clause 11 shall continue to be applicable during such period until the default is cured. The costs incurred by the Contractor for such correction shall be to the Contractor's account, and furthermore no payment shall become due to the Contractor. Any cost incurred due to non - performance of the Contractor by the Owner shall be charged to the Contractor.

19. Change Management:

Owner shall have the right at any time to order any change in the Work in accordance with the following procedure. Contractor shall furnish to Owner upon request as soon as reasonably possible but no later

than five (5) days following the request, a written statement specifying:

(a) the increase or decrease, as the case may be, in the costs of the Work which will result from a change in the Work as requested by Owner,

(b) any effect such change in the Work may have on any other provision of this Contract originating from either parties, and

(c) such other details as Owner may require.

Any change in costs shall be reasonably related to the proportional change in the Work and any other costs incurred by Contractor. If Owner agrees to Contractor's statement Owner shall notify Contractor thereof in writing in the form of a change order, whereupon the change in the Work shall be incorporated in the Work and immediately implemented. In the event that the change relates to a reduction in Work, the work in question shall not be undertaken pending the issue of an appropriate Change Order.

20. Governing Laws

This Contract shall be construed in accordance with and governed by the Laws of India without giving effect to any principle of conflict of law.

21. Jurisdiction

This Contract and the transaction contemplated herein shall be subject to the exclusive jurisdiction of the competent Courts in Mumbai only.

22. Dispute settlement:

Dispute or differences arising out or relating to this Order shall be resolved amicably by the parties. Failing such amicable resolution of dispute / differences either party may refer the matter to arbitration of a Sole Arbitrator to be appointed jointly by both the parties. The award of the Arbitrator shall be final, binding and conclusive on the parties. The venue for arbitration shall be Mumbai. The Arbitration proceedings will be governed and regulated by the provisions of Indian Arbitration and Conciliation Act, 1996 as amended from time to time and the rules framed there under.

23. Force majeure:

23.1 In the event of either party being rendered unable by force majeure to perform any obligation required to be performed by it under this Contract the relative obligation of the party affected by such force majeure shall, after notice under this articles be suspended for the period during which such cause lasts. The term 'Force Majeure' as employed herein shall mean acts of God, wars (declared or undeclared), riots or civil commotion, fire, floods, and acts and regulations of the Government of India or State Government or any of the statutory agencies. Both the party shall pay to the other party, the amount payable upon the date of the occurrence of such force majeure.

23.2 Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid, thereby shall notify the other party in writing immediately but not later than twenty four (24) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of the claims.

23.3 During the period, the obligations of the parties are suspended by force majeure; the contractor shall not be entitled to payment of any rate.

23.4 In the event of the force majeure conditions continuing or reasonably expected to continue for a period more than thirty (30) days, Owner shall have the option of terminating the contract by giving seven (7) days notice thereof to the contractor.

24. Sub letting and Assignment

The contractor shall not, without prior consent in writing of the Owner, sublet, transfer or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever, provided nevertheless that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

25. Limitation of Liability:

Notwithstanding anything contained in the Contract, the Contractor's aggregate liability under this Contract shall be limited 100% of the Total Contract value. This shall exclude liability arising pursuant to clause 3-Compliance to Local Laws, clause 9.10, clause 14-Indemnity against IPR, clause 13- Indemnity, clause 26 – Confidentiality, liability arising due to loss of or damage to the Free Issue Material (FIM) issued by Owner to Contractor for completion of the Work and liability arising due to wilful misconduct, gross negligence, third party claims and corrupt acts attributable to the Contractor.

26. Confidentiality:

The Contractor shall use the Confidential Information of the Owner only in furtherance of this Contract and shall not transfer or otherwise disclose the Confidential Information to any third party. The Contractor shall (i) give access to such Confidential Information solely to those employees with a need to have access thereto; and (ii) take the same security precautions to protect against disclosure or unauthorized use of such Confidential Information that the party takes with its own confidential information but, in no event, shall a party apply less than a reasonable standard of care to prevent such disclosure or unauthorized use.

27. Termination:

27.1 The Contract shall be deemed to be terminated on completion of the Contract period.

27.2 Termination of default by Contractor:
Owner may terminate the contract at any time if the Contractor fails to carry out any of his obligations under this Contract. Prior to termination, the Contractor shall be advised in writing of the causes of unsatisfactory performance to be improved upon 15 days of the receipt of notice. In case, if the Contractor fails to bring about the improvement to the satisfaction of the Owner, then the Contract shall be terminated.

27.3 Without prejudice to the rights and remedies available to Owner, Owner may terminate the Contract or part thereof with immediate effect with written notice to the Contractor if,:

27.3.1 The Contractor becomes bankrupt or goes into liquidation.

27.3.2 The Contractor makes a general assignment for the benefit of creditors.

27.3.3 A receiver is appointed for any substantial property owned by the Contractor.

27.3.4 The Contractor is in breach of any representation or warranty made to the Owner by the Contractor.

The Contractor shall not be entitled to any further payment under the Contract if the Contract is terminated. If the order is terminated under clause 27.2 and 27.3, the Contractor shall not be entitled to any further payment, except that, if Owner completes the Work and the costs of completion are less than the Contract Price, the Owner shall pay Contractor an amount properly allocable to services fully performed by Contractor prior to termination for which payment was not made to Contractor. In case, the cost of completion of Work exceeds the Contract Price, the additional cost incurred by Owner for such completion shall be paid by the Contractor.

27.4 Owner shall be entitled to terminate the Contract at it's convenience, at any time by giving thirty (30) Days prior notice to the Contractor. Such notice of termination shall specify that termination is for Companies convenience and the date upon which such termination becomes effective. Upon receipt of such notice, the Contractor shall proceed as follows:

27.4.1 cease all further work, except for such work as may be necessary and instructed by the Owner/ Owner's representative for the purpose of preserving and protecting Work already in progress and protect materials, facilities and equipment on the Work Site or in transit;

27.4.2 stop all further sub-contracting or purchasing activity, and terminate Sub-contracts;

27.4.3 handover all Documents, equipment, materials and spares relating to the portion of Work already executed by the Contractor or procured from other sources up to the date of termination for which the Contractor has received payment equivalent to the value thereof; and

27.4.4 handover those parts of the supplies manufactured/ work executed by the Contractor up to the date of termination.

Upon termination pursuant to clause 27.4, the Contractor shall be entitled to be paid (a) all sums properly due to the Contractor under the Contract up to the date of termination; and (b) any direct and substantiated charges already incurred or committed for cancellation of the procurement of third party goods or services which were to have been supplied by the Contractor in connection with this Contract provided that the Contractor shall use its best endeavours to minimise such charges

25.5 The Contractor shall not be released from any of his obligations or liabilities accrued under the Contract on termination. For the avoidance of doubt, the termination of the Contract in accordance with this clause shall neither relieve the Contractor of his accrued obligations for Warranty or his accrued liability to pay (liquidated) damages for Delay nor shall entitle him to reduce the value of Performance Security.

28. Consequential Damages:

Unless otherwise specified, neither Party shall be responsible for and nor shall be liable to the other Party for indirect/consequential losses and damages suffered by such Party including for loss of use, loss of profit whether such liability or claims are based upon any negligence on the part of the other Party or its employees in connection with the performance of the Contract.

29. Environment / ISO 14001 Certification:

The Contractor to confirm whether their organization is ISO 14001 certified. If not, the Contractor must certify that the handling, use and disposal of their product / by-products conform to practices consistent with sound environmental management and local statutes. The Contractor shall ensure that all the wastes are disposed in environmental friendly way with strict compliance to applicable laws including adherence to MoEF guidelines with respect to disposal of batteries, lead waste, copper cables, ash, waste oil, e-waste etc which shall be disposed through MoEF approved

parties only. The Contractor shall also be responsible to collect and recycle all the e-waste generated at the end of the product life cycle at its own costs and risks as per the MoEF guidelines/ orders.

30. Non-Exclusive Agreement

This Contract is non-exclusive and Owner reserves the right to engage other contractors to perform similar or identical work. Contractor shall accord such other contractors adequate opportunity to carry out their contracts and shall accomplish the Work in co-operation with those contractors and with Owner, in accordance with such instructions as may be issued by the Owner from time to time.

31. Severability

In the event that any of the provisions, or portions or applications thereof, of this Contract are held to be unenforceable or invalid by any court or arbitration panel of competent jurisdiction, Contractor and Owner shall negotiate an equitable adjustment to the provisions of the Contract with a view towards effecting the purpose of the Contract and the validity and enforceability of the remaining provisions, or portions or applications thereof, shall not be affected thereby.

32. Housekeeping & Removal of scrap:

The Contractor shall be responsible for keeping the areas of his work at site, neat and tidy throughout the period of his work. All excess material/ spares/ consumables taken by Contractor, as well as the scrapped items and wooden logs/ crates/ planks shall be returned, from time to time, to the Stores, and transported/ unloaded by Contractor's personnel at the place shown by Order Manager/Engineer-in charge.

The Contractor shall so arrange that all the scrap generated during the progress of his work, is separated into two categories, viz.

i) Saleable scrap like steel, copper or other metals, etc., and,

ii) Others, which have nil or negligible resale value, like insulation material, jute, debris, etc. (or as directed by the Order Manager/Engineer-in charge).

The saleable scrap shall be shifted to and unloaded at a central place as per directions of the Stores-in charge, while the other scraps shall be shifted to other locations as per directions from Order Manager/ Engineer-in Charge, or as per terms of the order.

The Contractor shall arrange to remove the scrap on regular basis, or even on daily basis, depending upon the requirement, to keep the area around his work-place neat and tidy. In case, it is observed that the Contractor is not carrying out regular cleaning of his areas of work, or, is not returning the excess materials/ scrap, etc., to the Stores, Owner reserves the right to arrange the same through other sources, and back-charge the Contractor the cost of doing so, along-with overheads, by deducting the amount from Contractor's bills.

Contractor's final bill will be cleared by Owner only after confirming that proper clearing of his areas of work has been completed by the Contractor, and same is certified by the Order Manager/ Engineer in-charge

33. Tata Code of Conduct

The Owner abides by the Tata Code of Conduct in all its dealing with stake holders and the same shall be binding on the Owner and the Contractor for dealings under this Order/ Contract. A copy of the Tata Code of Conduct is available at our website: http://www.tatapower.com/aboutus/code-of-conduct.aspx. The Contractor is requested to bring any concerns regarding this to the notice of our Chief Ethics Officer on the e-mail ID: cecounsellor@tatapower.com.

34. Responsible Supply Chain Management:

The Owner is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy. The Contractor is required to comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations. The Owner encourages its Vendors/ Contractors/ Business partners to pay more attention to green design, green supply, green production, green logistics and green packaging in performing their business obligations.

The Contractor is required to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy.

A copy of the Responsible Supply Chain Policy along with Environment policy, Energy Conservation policy, Sustainability policy, Health & Safety policy and Human Rights policy is available at website: http://www.tatapower.com/sustainability/policies.aspx.

Contractor/Bidder is required to completely fill the attached "Supplier Sustainability Questionnaire" in support of their Green Supply Chain Management initiatives and submit the same with their offer.

The Owner recognizes that diversity in the workplace positively impacts business. The Owner is committed to help people from SC/ST background either by helping them to become entrepreneurs or by engaging workforce from SC/ST community under the contracts agreed herein. To encourage engaging SC/ST community, the owner may consider on the merit to incentivize the Contractor by paying additional 1% of

the service contract portion if the number of SC/ST workforce engaged in the contract exceeds 30% of the total deployed strength and 2%, if the strength goes beyond 50%. While the Contractor will assist the workforce so engaged to become self-reliant in meeting the work expectation, the Owner may also volunteer its training resources to the extent possible to improve their employability. The Contractor shall maintain the proper documentation of such category of the workforce engaged and the owner may consider to pay the incentive after its verification.

The Owner may also consider extending price preference of 5% in the bid evaluation for an order value up to Rs.50 Lacs, provided the company is owned by a person from SC/ST community having minimum 50% holding in the company.

35. Vendor rating:

You are requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Your performance with respect to the said factors will be taken into consideration for future business.

36. Vendor Feedback:

34.1 In this dealing Vendors feedback is important for the purchaser to improve its processes. If Contractor have to report any grievance, problem or require any clarification, information, Contractor is requested to contact purchaser at email ID: CC_CUSTOMERFEEDBACK@tatapower.com

34.2 Contractor is requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Contractor performance with respect to the said factors will be taken into consideration for future business.

37. Non-Waiver:

Failure of Owner or its representatives to insist upon adherence to any of the terms or conditions incorporated in the Contract or failure or delay to exercise any right or remedies herein or by law accruing, or failure to promptly notify the Contractor in the event of breach or the acceptance of or the payment of any Material(s) hereunder or approval of any design or Material(s) shall not release the Contractor and shall not be deemed a waiver of any right of Owner to insist upon the strict performance thereof or of any of its rights or remedies as to any such Material(s) regardless of when the Material(s) are shipped, received or accepted not shall any purported oral modification or revisions of the Contract by Owner or its representative(s) act as waiver of the terms hereof.

ESG FRAMEWORK FOR BUSINESS ASSOCIATES

Tata Power's Sustainability philosophy sits at the core of its Business Strategy. Tata Power Sustainability Model has an overarching objective of 'Leadership with care' with key elements of 'Care for the Environment'; 'Care for the Community'; 'Care for our Customers / Partners' and 'Care for our People'. These sustainability objectives encompass the Environmental, Social and Governance objectives driven as integrated elements.

Tata Power, together with its stakeholders is determined to achieve sustainable growth while creating shared value for all.
As a part of future ready roadmap, Tata Power has targeted following as our Environment, Social and Governance priorities:

- Being Carbon Net Zero before 2045
- Growing Clean capacity (80% by 2030)
- Customer centricity
- Becoming water neutral before 2030
- Achieving zero waste to landfill before 2030
- No net loss of biodiversity before 2030
- Positively impacting 80 million lives by 2027

In order to create a sustainable business ecosystem, Tata Power expects that all its Business Associates (BA) which includes its suppliers, vendors, consultants and service providers to align to its ESG and sustainability commitments.

Tata Power encourages improved efficiencies and scaling up of green initiatives through technology and innovation taking us farther on the journey of reducing carbon emissions and preparing the entire eco-system towards products and services that would have net positive impact on the environment and communities that we operate in.

The Vendors/ bidders wishing to associate with Tata Power are expected to share their own sustainability and ESG journey. We at Tata Power promote all Business Associates to have a sustainable procurement policy for their supplier and service providers to contribute to our integrated approach in achieving a sustainable supply chain. The BA is encouraged to carry out the assessment of their sub-contractors and sub-vendors on sustainability readiness so that they are aware of the expectation/ business requirement.

The Vendor/ Bidder shall fill-in the 'Environment, Social and Governance Compliance Screening Questionnaire for Business Associates' attached at Annexure-I and submit the same along with the Bid in Ariba online platform.

Responsible Supply Chain Management:

Tata Power is committed for a cleaner environment and respect of Human rights through its Responsible Supply Chain Management policy.
Tata Power Business Associate (BA) shall comply with all the environment & Human rights related laws, including emission norms, Labour and environmental regulations.

Tata Power encourages its BA to focus on green design, green supply, green production, green logistics and green packaging in performing their business obligations. The BA is expected to abide by the Tata Power Corporate Environment policy, Energy Conservation and Corporate Sustainability Policy (enclosed with this document as Annexure-II).

The BA is expected to:

- Strive towards Conservation of Energy, Water, Resources and optimize transportation of Men & Materials to minimize environmental impact and reduce carbon footprint.
- Carry out the assessment of materials used for construction, operation & maintenance, consumables and accordingly phase out those materials which are environmentally hazardous.
- Be cognizant that diversity in the workplace positively impacts business.
- Promote affirmative action by supporting people from SC/ ST background by engaging workforce from SC/ ST community under the contracts agreed herein.
- Share the commitment of 'No child labour', 'No forced labour', Non-discrimination on the basis of caste, colour, religion, gender, disability, maternity or pregnancy or any other factor unrelated to the requirements of the job
- Pay the wages or remuneration to the workforce, personnel deployed in compliance to all applicable laws and regulations.
- Provide its employees/ deployed labor with an employment environment that is free of physical or psychological harassment.
- Carry out the assessment of their Sub-contractors on their Sustainability Readiness so that they are aware of the above expectation/ standards
- To ensure usage of suitable package material which is more environmentally sustainable. Further the packing material shall be recycled to the extent possible. The material used for packing is expected to suit the mode of transport and to ensure its safe receipt at point of delivery.

Waste Disposal:

The BA is expected to follow best practices for disposal of waste, few of which are listed below:

- Have a detailed project plan that includes the waste management, segregation of all designated waste material (Recyclable/ Non-Recyclable), collecting, storing, disposing and transferring the same to pre-arranged facility/ destination in timely and safe manner as per environmental legislations. The project plan shall also include the innovative construction practice to eliminate or minimize waste, protect surface/ground water, control dust and other emissions to air and control noise.

- Have purchase policy to encourage the procurement of material with recycled and minimum packaging of goods during delivery and appropriate means for site-to-site transportation of materials to avoid damage and litter generation.

- Ensure that the residents living near the site are kept informed about proposed working schedule and timings/ duration of any abnormal noise full activity that is likely to happen.

- Ensure the regular maintenance and monitoring of vehicles and equipment for efficient fuel use so that emissions and noise are within acceptable limits to avoid air pollution.

Water Management:

The BA is expected to follow best practices for water management, few of which include a management and monitoring system for water withdrawals and consumption, procedures to reduce water usage or reuse/recycle water, and pretreatment of wastewater before disposal.

Compliance to Law:
The BA shall adhere to responsible business practices and comply with the provision of all the Statutory Acts Applicable. Special attention of the BA is drawn towards the compliance of provision of the following statues: (along with the latest amendments/additions, as applicable):

- The Child Labour (Prohibition and Regulation) ACT, 1986.
- The Contract Labour (Regulation and Abolition) ACT, 1970.
- The Employee's Pension Scheme, 1995.
- The Employee's Provident Funds and miscellaneous provisions Act, 1952.
- The Employees State Insurance Act, 1948.
- The Equal Remuneration Act, 1976.
- The Industrial Disputes Act, 1947.
- The Maternity Benefit Act, 1961.
- The Minimum Wages Act, 1948.
- The Payment of Bonus Act, 1965
- The Payment of Gratuity Act, 1972.
- The Payment of Wages Act, 1936.
- The Shops & Establishment Act, 1954.
- The Workmen's Compensation Act, 1923.
- The Employer's Liability Act, 1938.
- and any other applicable statutory act

Social Accountability (SA 8000):

Tata Power expects its BAs to follow guidelines of SA 8000:2014 on the following aspects

- Child Labour
- Forced or Compulsory Labour
- Health & Safety
- Freedom of Association & Right to Collective Bargaining
- Discrimination
- Disciplinary Practices
- Working Hours
- Remuneration
- Management System

Health and Safety

The BA is expected to ensure the health and safety of his and his Sub-contractor’s staff and labour. The BA shall, in collaboration with and according to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The BA shall maintain records and make reports concerning health, safety and welfare of persons deployed, and damage to property, as the Owner’s Representative may reasonably require. The BA shall be responsible for the medical treatment / hospitalization of his and his Sub-contractor’s staff/ labour.

The BA shall appoint a qualified Safety officer at the Site to be responsible for maintaining the safety, and protection against accidents, of all personnel on the Site. Such Safety officer shall have the authority to issue instructions and take protective measures to prevent accidents.

The BA shall comply in toto with the Tata Power's Contractor Safety Terms & Conditions, Health Safety & Environment Manual while working on Tata Power Site/ Services/ Contracts.

Grievance Mechanism

The BA is expected to have grievance procedures that allow stakeholders to anonymously bring environmental and/or work-related violations and/or concerns to the attention of management. In addition, the BA is expected to have procedures for examining reports of environmental and/or work-related violations or concerns and/or privacy complaints.

Data Protection

The BA is expected to have a formal process to address data security or privacy issues.

ANNEXURE-I

Sr. No.	Question Description	Response (Y/N)	Remarks
Organization			
1	Does your Company have Sustainability Policy at Organization Level? If Yes, Please attach		
2	Do you have sustainable procurement policy in place for your own suppliers? If Yes, Please attach		
3	Does your company do regular assessment of its suppliers on ESG parameters?		
4	Are there ESG risks, or negative impacts identified in your supply chain		
Governance			
1	Is diversity taken into consideration when appointing board members/ senior management? Do you have an independent director/s?		
2	Has your company taken initiatives to ensure ethical practices at workplace? Please share the details, Policies etc.		
3	Does your company have a formal process to address data security or privacy issues? Please share the details, Policies etc.		
4	Does your company have grievance mechanism for stakeholder issues and track resolution?		
Environment/ Planet			
1	Does your company have Environmental Policy? If Yes, Please attach		
2	Do you have a formal process for waste management including solid wastes, liquid wastes and hazardous waste?		
3	Does your company track greenhouse gas emission? Also, what percentage of own consumption comes from the renewable energy?		
4	Does your company have a formal process for water management including monitoring of water consumption and withdrawals, and if applicable, pretreatment of wastewater?		
Green Technology/ Innovation			
1	Are your facility/ Product/ Services provided by you is based on green design, green production, green packaging or green logistics considerations? Please elaborate.		
2	Do your products or services have any environmental or social features or benefits (e.g. environmental/energy certification, ecolabels, fair trade certification, etc.)?		
Social/ People			
1	Does you facility/ Company have written personnel policies in place Are you an equal opportunity employer?		
2	Please describe any formal programme / campaign in place to promote company involvement with the community (volunteering, etc.). What is the percentage of profit spend on community activities?		
3	Does your company have a written Health & Safety Policy or Program? If Yes, Please attach		
Certifications: Does your company have following certifications (valid till date-please mention validity)			
1	ISO9001 accreditation		
2	SA8000 or equivalent		
3	ISO 14001 certification		
4	ISO 18001/45001 or equivalent		
5	ISO/IEC 27001 or equivalent		
6	Any Other (Please specify)		

Signature

Business Associate Name

ANNEXURE-II

CORPORATE SUSTAINABILITY POLICY

At Tata Power, our Sustainability Policy integrates economic progress, social responsibility and environmental concerns with the objective of improving quality of life. We believe in integrating our business values and operations to meet the expectations of our customers, employees, partners, investors, communities and public at large

- We will uphold the values of honesty, partnership and fairness in our relationship with stakeholders
- We shall provide and maintain a clean, healthy and safe working environment for employees, customers, partners and the community
- We will strive to consistently enhance our value proposition to the customers and adhere to our promised standards of service delivery
- We will respect the universal declaration of human rights, International Labour Organization's fundamental conventions on core labour standards and operate as an equal opportunities employer
- We shall encourage and support our partners to adopt responsible business policies, Business Ethics and our Code of Conduct Standards
- We will continue to serve our communities:
    - By implementing sustainable Community Development Programmes including through public/private partnerships in and around our area of operations
    - By constantly protecting ecology, maintaining and renewing bio-diversity and wherever necessary conserving and protecting wild life, particularly endangered species
    - By encouraging our employees to serve communities by volunteering and by sharing their skills and expertise
    - By striving to deploy sustainable technologies and processes in all our operations and use scarce natural resources efficiently in our facilities
    - We will also help communities that are affected by natural calamities or untoward incidence, or that are physically challenged in line with the Tata Group's efforts

The management will commit all the necessary resources required to meet the goals of Corporate Sustainability.

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER
Lighting up Lives!

Supplier Code of Conduct

Tata Power follows the Tata Code of Conduct (TCoC) and the Whistle blower Policy and expect all its Suppliers to adhere to the same principles. **"Supplier"** here means any business, company, corporation, person or other entity that provides, sells or seeks to sell, any kind of goods or services to Tata Power, including the Supplier's employees, agents and other representatives.

Tata Code of Conduct- (TCoC): https://www.tatapower.com/pdf/aboutus/Tata-Code-of-Conduct.pdf

Whistle Blower Policy: https://www.tatapower.com/pdf/aboutus/whistle-blower-policy-and-vigil-mechanism.pdf

Anti-Bribery & Anti-Corruption Policy: https://www.tatapower.com/pdf/aboutus/abac-policy.pdf

The suppliers are expected to adhere to the following Do's and Don'ts:

Do's

1. The Suppliers shall be committed to supplying products and services of high quality that meet all applicable standards and laws, including product packaging, labelling and after-sales service obligations.
2. Comply with all applicable laws and regulations, both in letter and in spirit, in all the territories in which it operates.
3. Strive to provide a safe, healthy and clean working environment for its employees.
4. Strive for environmental sustainability, particularly with regard to the emission of greenhouse gases, consumption of water and energy and the management of waste and hazardous materials.
5. The Supplier shall represent our company (including Tata brand) only with duly authorised written permission from our company.
6. Safeguard the confidentiality on the use of intellectual property, information and data of the Company.
7. Gifts and hospitality given or received should be modest in value and appropriate as per Company Policy.
8. The assets of Tata Power shall be employed primarily and judiciously for the purpose of conducting the business for which they are duly authorised.
9. All actual or potential conflicts due to financial or any other relationship with a Tata Power employee shall be disclosed.

Don'ts

1. The Supplier shall not make unfair or misleading statements about the products and services of competitors.
2. Children shall not be employed at workplaces.
3. Forced labour shall not be used in any form.
4. The Suppliers shall neither receive nor offer or make, directly or indirectly, any illegal payments, remunerations, gifts, donations or comparable benefits that are intended, or perceived, to obtain uncompetitive favours for the conduct of its business with Tata Power.

Reporting Violations

The Supplier shall notify the Company regarding any known or suspected improper behaviour of other suppliers or employees relating to its dealings with Tata Power, by email to: cecounsellor@tatapower.com. The same can also be raised through our 3rd party ethics helpline facility:

Toll-free Number	1800 267 4065
Email	tatapower@tip-offs.in
Website & Chatbot	www.tatapower.tip-offs.in
Postal address	Attn to: Mr. Puneet Arora, Deloitte Touch Tohmatsu India LLP, 6 floor, AIPL Business, Sector 62, Gurugram, Haryana 122102

CYBERSECURITY COMPLIANCE

The Vendor unconditionally undertakes, for the entirety of the contract term and the warranty / support period, to comply with the cybersecurity obligations set out below. Acceptance of this clause is a condition precedent to award; non-compliance constitutes a material breach.

1. Universal Obligations — applicable to all Vendors and all supplies

(a) ISO/IEC 27001:2022 certification covering the supply scope is maintained current; where the supply includes vendor develop software, firmware, or a vendor operated software solution, an independent third-party VAPT of the offered solution has been conducted within the last 12 months (this VAPT requirement does not apply to distributors reselling OEM hardware such as laptops, switches, routers, and similar IT/OT and networking equipment's).

(b) No private Wi-Fi, personal hotspots, 4G/5G modems, unmanaged switches, or unauthorised broadband shall be deployed at Tata Power sites. All remote access shall be conducted exclusively through Tata Power's approved Secure Remote Access (SRA) solution and processes defined.

(c) MFA is enforced for privileged and remote access; integration with enterprise IAM (SAML 2.0 / AD / LDAP) is supported; RBAC under least privilege is applied; dedicated named accounts are used (no shared Vendor credentials); hardcoded or default credentials are prohibited in production; data is encrypted at rest using AES-256 (or equivalent) and in transit using TLS 1.2 or higher, with SSL / TLS 1.0 / 1.1 disabled.

(d) All operational, configuration, and diagnostic data remains the sole property of Tata Power; the supplied solution contains no hidden telemetry, backdoors, undisclosed data collection, or background cloud synchronisation.

(e) For IT solutions and applications, security patches shall be provided within: Critical (CVSS ≥ 9.0) 15 days; High (7.0–8.9) 30 days; Medium (4.0–6.9) 60 days; Low (< 4.0) 90 days. For OT solutions, security patches for vulnerabilities with a CVSS score above 8.0 shall be provided to Tata Power as and when released by the OEM / Vendor, after due testing in a representative environment to prevent operational instability. Zero-Day interim mitigation is issued within 24–48 hours of internal discovery. Not less than 12 months' written notice of any EOL / EOS milestone shall be given.

(f) Tata Power shall be notified of any confirmed or suspected security breach within 4 hours of discovery, with full cooperation for CERT-In's 6-hour mandate.

2. Conditional Obligations — applicable where the supply category applies

(a) IT Software / Firmware (where the supply includes Vendor-developed software or firmware): A documented SSDLC with SAST, DAST, and SCA gates is operated; a machine-readable SBOM is delivered identifying all components, versions, licences, and known CVEs at delivery.

(b) IT Hardware & Endpoints (servers, workstations, laptops, network equipment): EDR / AV with 3 years of free updates is bundled, or formal compatibility with Tata Power's chosen EDR / AV with central manager is declared; Windows endpoints are hardened to CIS Benchmark Level 1; BIOS / UEFI password protection is enabled; boot-from-external-media is disabled; USB ports are lockable; unused ports, services, and default accounts are disabled and documented; shipments arrive in tamper-evident packaging.

(c) Operational Technology / ICS (PLCs, RTUs, IEDs, SCADA, EMS, DCS, HMIs, OT firewalls, MES, SIS, engineering workstations and OT endpoints/computers): IEC 62443-4-1 and 4-2 compliance is held or independently assessed; architecture aligns with the Purdue Model with a Communication Matrix; MES-to-OT exchanges traverse approved OT firewalls (no direct IT-to-Level 1 / 2 connectivity); Secure Boot with cryptographic firmware validation; offline patching via removable media or local update server (no internet dependency); SIS is physically and logically segregated from BPCS (no shared credentials, networks, or power); secure industrial protocols supported (DNP3 SAv5, IEC 61850 with TLS, OPC-UA SignAndEncrypt) — Telnet, FTP, SNMP v1 / v2c, unencrypted HTTP, rsh, rlogin are not used on any OT segment; application whitelisting enabled on HMIs by default; all OT project files (PLC / DCS / RTU programs, HMI projects, SCADA exports, IEC 61850 SCL / CID / SCD files, network device configs, SIS files) are delivered in native and vendor-agnostic formats at handover and refreshed after every configuration change. Cybersecurity compliance during FAT and SAT is a condition of acceptance; non-conformance entitles Tata Power to reject equipment without commercial impact, with any re-FAT / re-SAT at Vendor's cost.

(d) Cloud / SaaS (solutions hosted outside Tata Power's infrastructure): A current SOC 2 Type II report or ISO 27017 / 27018 certification covers the offered service; all data processing, storage, and transmission occurs exclusively within India unless explicitly approved in writing by the Tata Power CISO and Legal teams.

(e) Personal Data Processing (any solution processing personal data on behalf of Tata Power, regardless of hosting model): The Digital Personal Data Protection Act, 2023 is complied with; a Data Processing Agreement defining data categories, retention, deletion, sub-processor disclosure, and the Vendor's processor role shall be executed prior to go-live.

3. Remedies, Indemnity, and Survival

(a) Any false, misleading, or materially incomplete declaration, or any material non-compliance with this clause, shall entitle Tata Power to: (i) disqualify the bid; (ii) terminate any awarded contract for material breach; (iii) forfeit bid security and performance guarantees; (iv) blacklist the Vendor for a period determined by Tata Power; and (v) pursue such other legal recourse, civil or criminal, as may be available.

(b) The Vendor shall indemnify Tata Power against losses, penalties, damages, regulatory fines, and reasonable legal costs arising from a security breach attributable to the Vendor's negligence or non-compliance with this clause.

(c) Sub-clauses 1(d), 1(f), 2(d), and 2(e) shall survive expiry or termination of the contract for the period during which Tata Power data remains in the Vendor's custody, or any obligation remains capable of giving rise to a cause of action, whichever is longer.