(Corporate Contracts Department)
The Tata Power Company Limited, 2nd Floor, Sahar Receiving Station
Sahar Airport Road, Andheri East, Mumbai-400059

Procedure for Participating in Tender

Tender Enquiry No.	Work Description	EMD (Rs.)	Tender Participation Fee	Last date and time for Payment of Tender Participation Fee
CC23VKD047	1 Year OLA for Supply and integration of Smart Meters. Tata Power Mumbai Distribution.	10 Lacs	Rs. 2000	09.03.2023 1500 Hrs

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

Procedure for Participating in Tender. Following steps to be done before "Last date and time for Payment of Tender Participation Fee" as mentioned above

1. Eligible and Interested Bidders to submit duly signed and stamped letter on Bidder's letterhead indicating
    a. Tender Enquiry number
    b. Name of authorized person
    c. Contact number
    d. e-mail id
    e. Details of submission of Tender Participation Fee
2. Non-Refundable Tender Participation Fee, as indicated in table above, to be submitted in the form of

    Direct deposit in the following bank account and submit the receipt along with a covering letter clearly indicating the Tender Reference number –

    Beneficiary Name – The Tata Power Co. Ltd.

    Bank Name – HDFC Bank Ltd.

    Branch Name – Fort Branch, Mumbai

    Address – Maneckji Wadia Building, Nanik Motwani Marg, Fort, Mumbai 400023.

    Branch Code – 60

    Bank & Branch Code – 400240015

    Account No – 00600110000763

    Account type – CC

    IFSC Code – HDFC0000060

E-mail with necessary attachment of 1 and 2 above to be send to **Ms. Vaishali Kachare** (vaishali.kachare@tatapower.com) and copy to **Mr. Milan Patel** (mrpatel@tatapower.com) , **Mr.**

Selva Ganesh (selva.ganesh@tatapower.com) before “Last date and time for Payment of Tender Participation Fee”

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

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

No e-mail or verbal correspondence will be responded. All communication will be done strictly with the bidder who have done the above steps (Payment of tender fee and submission of letter with requisite details) to participate in the Tender.

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

Any payment of Tender Participation Fee / EMD by Bidder who have not done the pre-requisite within stipulated timeline will not be refunded.

OPEN TENDER NOTIFICATION

FOR

1 Year OLA for Supply and integration of 4G Smart Meters for Tata Power Mumbai Distribution.

Tender Enquiry No.: CC23VKD047
(Please note this reference number has to be quoted in all submission pertaining to this tender)

The Tata Power Company Limited (Tata Power)
Corporate Contracts,

Smart Center of Procurement Excellence,

2nd Floor, Sahar Receiving Station,

Near Hotel Leela,

Sahar Airport Road,

Andheri East, Mumbai-400059

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CONTENTS OF THE ENQUIRY

Following Documents Form Part of Tender Enquiry:

Section no	Description
A	Tender Notice Including Instruction to Bidders and key formats (this document)
	A1 Tender Notice Including Instruction to Bidders
	A2 : Pre-Qualification Requirement
	A3 : Price Bid Format
	A4 : Query / Clarification / Deviation Format
	A5 : Special Condition of Contracts
	A6 : Earnest Money Deposit Bank Guarantee Format
	A7 : CPBG / PBG Format
B	Technical Job Scope/ Specification
C	Standard Terms and Conditions and other documents
	C1 General Terms and Conditions – Supply
	C2 General Terms and Conditions – Services
	C3 General Terms and Conditions – Addendum for Open Tender
	C4 Safety Terms and Conditions
	C5 Safety PQR Requirement Submission Format
	C6 Health and Safety Policy
	C7 Environment Policy
	C8 Sustainability Policy
	C9 Tata Code of Conduct

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Section A1 : Tender Notice including Instruction to Bidders

1. Tender Details

1.1 Key Tender Specific Details

Reference Number	**CC23VKD047**
Description	**1 Year OLA for Supply and integration of Smart Meters. Tata Power Mumbai Distribution.**
Type of Tender	**Firm**
Tender Fee	**Rs 2000/-**
Earnest Money Deposit (EMD)	**Rs 10,00,000/-** **Rs Ten lakhs Only** **PLEASE NOT THAT IT IS MANDATORY TO SUBMIT EMD IN BANK GUARANTEE FORMAT ONLY**
Price Basis	**Firm.** The Price Bid shall remain valid for 18**0** days from date of bid submission / E-auction / Negotiation whichever is later and the Contract price shall remain **Price Variation Basis (Details in Section 2)**.
Executive Handling this Tender*	Name: Ms Vaishali Kachare (Mob No 9920932282) E-Mail ID: vaishali.kachare@tatapower.com
Reporting Manager*	Name: Mr. Ganesh Selva E-Mail ID: selva.ganesh@tatapower.com
Technical Query *	Name: Mr. Vishal Agrawal / Mr. Ruman E-Mail ID : vishal.agrawal@tatapower.com/ruman.maknojia@tatapower.com

*You may contact the above personnel from Monday to Friday during office hours only.

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1.2 Calendar of Events

(a)	Payment of Tender Fee and Submission of letter nominating authorized person by Interested Bidder indicating their intent to Buy Tender	Till 24 Feb 2023, 1500 Hours
(b)	Access to Tender Documents through E-Tender system to authorized person of Interested Bidder	By 24 Feb 2023
(c)	Last Date of receipt of pre-bid queries, if any.	By 28 Feb 2023
(d)	Last Date of Posting Consolidated replies to all the pre-bid queries as received	By 2 Mar 2023
(e)	Last date and time of receipt of Bids	9 March 2023 later 15:00 Hours

Note:- * These date and time are as planned and tentative. In case of change the same shall be intimated to Authorized Person of Interested Bidder through E-Tender System.

Please note post submission of Bids relevant communication will be done with Authorized Person of Interested Bidder through E-Tender System

1.3 Mandatory documents required along with the Bid

1.3.1 Bid Guarantee Fee (EMD) of requisite value and validity. PLEASE NOTE THAT BID GUARANTEE ONLY IN FORM OF BANK GUARANTEE WILL BE ACCEPTED.

1.3.2 Requisite Documents to ascertain fulfilling of Technical and Commercial Pre-Qualification Requirement as detailed in Tender Enquiry.

1.3.3 Technical Submission including Drawings, Type Test details etc as detailed in Technical Specification.

1.3.4 Required Commercial Submission as detailed in Tender Document

1.3.5 Technical and Commercial Clarification and Deviations as per the format attached in the Tender Enquiry

1.3.6 Proper authorization letter to sign the tender and participate in Tata Power E-Tender system on the behalf of bidder.

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

Also please note that whenever editable format are shared it is requested that data be filled in relevant cells. No formatting or addition / deletion of rows / columns to be done. Wherever editable Excel submission are requested the file should be free from references, macros etc.

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Checklist of Document Submission

Stage of Tendering	Document	Type of Format	Mode of submission
Before last date of Pre-Bid Query	Query / Clarification / Deviation (QCD) Format. Separate Excel sheet to be used for Technical and Commercial Pre-Bid Query	Editable Excel Format	Through message in E-tender system
Bid Submission Envelope 1 (First Part)	**Earnest Money Deposit**	**Original Bank Guarantee**	**In Sealed Envelope**
Bid Submission Envelope 2 (Second Part)	**Documents to be uploaded in Ariba only.** In case of multiple files, a zipped folder can be attached for the same (size limit of 100MB per zipped file)		
	Technical PQR and Backup documents for Technical PQR	Editable Excel / Signed and Scanned documents	E-Tender System
	Technical Submission as required for Technical Specifications and all backup documents	Editable Excel / Signed and Scanned documents as required	E-Tender System
	Query / Clarification / Deviation (QCD) Format for Deviation if any	Editable Excel Format	E-Tender System
	Duly filled Unpriced Bid Format	Signed and scanned copy of document	E-Tender System
Bid Submission Envelope 3 (Third Part)	Duly filled Priced Bid Format	To be entered in E-Tender System	E-Tender System

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		Signed and scanned copy and editable Excel zipped in one file	

1.4 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 Query / Clarification / Deviation (QCD) Format. Deviations have to be mandatorily submitted in editable Excel sheet Technical and Commercial deviation have to be submitted separately.
Technical or Commercial Deviation should be mentioned in Deviation Format only. Deviation in any other document or Format will not be considered.

1.5 Right of Acceptance/Rejection

1.5.1 Bids are liable for rejection in absence of following:-
1.5.2 Mandatory Documents as listed in 1.3 above
1.5.3 Price Bid as per the Price Schedule mentioned in Tender Document
1.5.4 Receipt of Bid and Response to queries within the due date and time
Tata Power reserves the right to accept/reject any or all the bids without assigning any reason thereof.

1.6 Qualification Criteria

Qualification Requirement expectation and document are detailed in documents in Section A2

1.7 Pre-Bid Queries

Pre-Bid Queries if any has to be sent through message in E-Tender System. Pre-Bid Query has to be sent only in the Query / Clarification / Deviation (QCD) Format. Technical Pre-Bid Query and Commercial Pre-Bid Query have to be submitted in Separate Editable Excel File in Prescribed Format. Pre-Bid Queries sent in any other format or send through any other communication channel will not be accepted and answered. Pre-Bid Query have to be sent in the stipulated timeline as defined in the Tender Document. No Pre-Bid Query will be accepted after the due time and date as specified as "Last Date of receipt of pre-bid queries, if any"

1.8 Marketing Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the General Condition of Contracts and other parts of Tender Documents. Bidders must agree to these rules prior to participating. In addition to other remedies available, Tata Power 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 or other part of the Tender Documents. A bidder who violates the market place rules or engages in behavior that disrupts the fair execution of the marketplace, may result in restriction of a bidder from further participation in the marketplace for a length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace

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- Breach of terms as published in TENDER
- Submit irrelevant documents or frequently cases of missing documents as part of compliance to Qualifying, Technical or Commercial Requirements causing unnecessary delay in Tender Evaluation

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 Tata Power. This includes all bidding information submitted to Tata Power. All tender documents remain the property of Tata Power and all suppliers are required to return these documents to Tata Power upon request. Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

2. 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 / each line item as calculated in Schedule of Items. Tata Power 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 has to mandatorily quote against each item of Schedule of Items. Failing to do so, Tata Power may reject the bids.

NOTE: In case of a new bidder not registered with Tata Power, factory inspection and evaluation shall be carried out to ascertain bidder's manufacturing capability and quality procedures. However Tata Power 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 Tata Power shall be final and binding on the bidder in this regard.

2.1 Price Variation Clause and Cap: Not applicable

3. Submission of Bid Documents

3.1 Bid Submission

Bidders are requested to submit their offer in line with this Tender document. Bids shall be submitted in 3 (three) parts:

FIRST PART: "EMD – BANK GUARANTEE" of Value detailed in 1.1 valid for 180 days from the due date of bid submission in the form of Bank Guarantee favoring 'The Tata Power Company Limited'. The EMD has to be strictly in the format as mentioned in Tender Document, failing which it shall not be accepted by Tata Power and the bid as submitted shall be liable for rejection.

Note : BG of 180 days and further claim period of 180 days is needed. In case the same cannot be issued by your bank then BG valid for 365 days can be provided.

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Note : At times bidders have sought Tata Power bank details which is needed by them to make BG. Hence the same is reproduced below. These details are only provided to facilitate making of BG if needed

Tata Power's Bank Details for submitting EMD BG:
Bank Name & Address – ICICI Bank, 163 HT Marg,
Backbay Reclamation, Churchgate, Mumbai 400 020.
A/c no. - 000451000293
IFSC Code – ICIC0000393

The hard copy of EMD in a sealed envelope should be sent on address mentioned in Tender document.

First Part has to be submitted in Sealed Envelope.

First part of the bid shall be sealed in envelope and then placed in a Separate sealed envelope which shall be clearly marked as below:

EMD BID –
"Please mention Tender Reference No"

Please mention our Tender Reference No on the Tender and drop the same in our Tender Box located at Corporate Contracts, The Tata Power Company Limited (Tata Power), Smart Center of Procurement Excellence,2nd Floor, Sahar Receiving Station, Near Hotel Leela, Sahar Airport Road, Andheri East, Mumbai-400059

The bids and the outer envelope shall be addressed to:

Head – Contracts – T & D
Corporate Contracts,

The Tata Power Company Limited (Tata Power),

Smart Center of Procurement Excellence,

2nd Floor, Sahar Receiving Station,

Near Hotel Leela, Sahar Airport Road,

Andheri East, Mumbai-400059

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

SECOND PART: "TECHNICAL / UN-PRICED COMMERCIAL BID" shall contain the following documents:

a) Documentary evidence in support of Technical, Commercial qualifying criteria

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b) Technical literature/GTP/Type test report/Details of Qualified Manpower Available/ Testing Facility available etc. *(complete in all respect as desired and detailed in Technical Specification and Technical Requirement Section)*
c) Duly filled Technical and Commercial Deviation Sheets
d) Duly filled formats like Authorization affidavit form
e) *Unpriced Commercial Bid*

The technical / un-priced commercial bid shall be properly indexed and is to be submitted in Soft Copy though E-Tender system of Tata Power. Hard Copy of Technical Bids need not be submitted.

Second Part has to be submitted through E-Tender System Only

THIRD PART: "PRICE BID" shall contain only the price details and strictly in Price Bid format along with explicit break up of basic prices and applicable GST. Basic price should include packaging forwarding, freight, transit insurance and any other cost envisaged by the bidder. Editable Excel copy and sealed and signed copy are to be zipped together and to be submitted in E-Tender System.

Third part has to be submitted only through E-Tender System.

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

Bids submitted by Email/Telex/Telegram /Fax will be rejected. No request from any Bidder to Tata Power to collect the proposals from Courier/Airlines/Cargo Agents etc. shall be entertained.

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

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Communication Details: Detailed in 1.1

3.3 Bid Prices

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

The quantity break up shown else-where other than Price Schedule is tentative. The bidder shall ascertain himself regarding material required for completeness of the entire work. Any items not indicated in the price schedule but which are required to complete the job as per the Technical Specifications/ Scope of Work/ 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. It also may be noted that the denomination of Purchase Order / Outline Agreement / Rate Contract and associated Payment to Successful Bidder shall also be in Indian Rupees Only. In case Bidder intends to import any equipment, part etc and supply to Tata Power then all liability and costs related to import will rest with the Bidder. All statutory compliances, payments, expenditure etc related to importing of equipment will be responsibility of the bidder.

3.5 Period of Validity of Bids

Bids shall remain valid for 180 days from the due date of submission of the bid / E-auction / Negotiation which is later

Notwithstanding clause above, Tata Power 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 Tata Power against the risk of bidder's conduct which would warrant forfeiture.

The EMD shall be in following form:

- Bank Guarantee valid for 180 days after due date of submission.

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The EMD shall be forfeited in case of:

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

Or

b) In case of a successful bidder, if the Bidder, within 15 days, does not
i) accept the purchase order, or
ii) furnish the required Contract Performance Bank Guarantee (CPBG)

Original Bank Guarantee submitted as EMD shall be returned only after completion of award process for unsuccessful bidders and issue of Contract Performance Bank Guarantee (CPBG) for successful bidder.

3.9. Contract Performance Bank Guarantee

Bidder shall submit Contract Performance Bank Guarantee in line with Technical specifications of meter (Refer section B).

4. Bid Opening & Evaluation process

4.1 Process to be confidential

Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process. Any effort by a Bidder to influence Tata Powers 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 Corporate Office of Tata Power as per our standard Process. The bids shall be opened internally by Tata Power. Technical bid must not contain any cost information whatsoever.

First the envelope marked “EMD” will be opened. Bids without EMD 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 in E-Tender system.

4.3 Preliminary Examination of Bids/Responsiveness

Tata Power 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. Tata Power may ask for submission of original documents in order to verify the documents submitted in support of qualification criteria.

Prior to the detailed evaluation, Tata Power 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.

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Bid determined as not substantially responsive will be rejected by the Tata Power and/or the Tata Power 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, Tata Power may, at its discretion, ask the Bidder for a clarification on its Bid for any deviations with respect to the Tata Power 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 Tata Power.

4.5 Price Bid Opening

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 Tata Power without any further correspondence in this regard.

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.

4.6 Reverse Auction and Price Matching Option

Tata Power reserves the right to conduct the reverse auction AND / OR Manual Negotiations for the products/ services being asked for in the tender. Only Technical Qualified Bids will be allowed to participate in e-auction. Date and time of e-auction will be intimated through E-Tender system to Authorized Person of Interested Bidder.

For case where more than one bidders have to be awarded (including Rate Contract / Outline Agreement) Price Matching Option will be exercised. Volume of job allocated to original competitive bidder will be more than bidder who is chosen through Price Matching Option. Tata Power decision regarding work sharing shall be final and no explanation OR clarification shall be given regarding the same.

5.0 Award Decision

Tata Power 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 Priced Bid Format subject to any corrections required in line with Clause 4.3 above. The decision to place purchase order/Outline Agreement/ Rate Contact solely depends on Tata Power on the cost competitiveness across multiple lots, quality, delivery and bidder's capacity, in addition to other factors that Tata Power may deem relevant.

Tata Power 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.

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

5.1 Rate Contract / Outline Agreement

Rate Contract / Outline Agreement does not guarantee any assured business volume in Rupees or Quantity. Quantities are only indicative and specified for the purpose of readiness as per the request from Purchaser. Supplies shall be only against Firm Purchase Orders placed as per the agreed terms and conditions of Rate Contract / Outline Agreement. Purchaser shall be entitled at its discretion to place firm order for such supplies on "As and When Required Basis" without minimum take-off guarantee.

Rate Contract / Outline Agreement will have list of Items with Unit Rate and applicable Taxes and Duties. There will be a cap on value for which order which can be placed against the Rate Contract / Outline Agreement. Actual quantity ordered for each line item may differ significantly from the tentative quantity indicated in the Tender Document. One / few / all items of Rate Contract / Outline Agreement can be ordered till the Cap Value is reached.

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. Outline Agreement/Purchase Order (with Commercial conditions)
2. Special Terms and conditions (if applicable)
3. General Terms and conditions
4. Technical Specifications

In case there is a discrepancy in the BOQ mentioned in tender (to the extent modified through subsequent Corrigendum, if any) and the bid submitted by any bidder, the description as mentioned in the tender (to the extent modified through subsequent Corrigendum, if any) shall prevail.

7.0 Ethics

Tata Power is an ethical organization and as a policy Tata Power 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.

Tata Power work practices are governed by the Tata Code of Conduct. Bidder is request to refer Tata Code of Conduct Clause in General Terms and Conditions.

8.0 General Condition of Contract and Special Condition of Contracts

Any condition not mentioned above shall be applicable as per General Terms and Conditions and Special Condition of Contracts attached along with this tender.

---XXX---

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Section A2 : Pre-Qualification Requirement

Following is the Qualification Requirements:

Qualification of Bidder will be based on meeting the minimum eligibility criteria specified below regarding the Bidder's Technical Experience and Financial requirement **(Refer A2. Prequalification criteria Technical and Commercial)** as demonstrated by the Bidder's responses in the corresponding Bid Schedules.

The smart meter shall be onboarded on the existing smart meter application (HES). Bidder shall extend the desired support to integrate these smart meters with existing smart meter application without any extra cost.

A2) Pre-Qualification Criteria (Technical & Commercial):

Parameter	Tata Power Requirement	Documents to be submitted by Bidder for ascertaining Pre-qualification requirement
Manufacturing& Testing Capability	The bidder should be a manufacturer (OEM) of Static Energy Meters with manufacturing plant(s) / assembly located in India.	Confirmation by the Bidder
Experience	The bidder should have manufactured & supplied 1 Lakh (Quantity) Number of Smart Meters in last 5 years as on original bid submission date. Out of above, Minimum of 50,000 (Quantity) of Smart Meter should have been in satisfactory commercial operation for a minimum period of 1 years as on original bid submission date.	Supply List & Performance Certificates from the utilities / clients. Bidder to submit Performance Certificates for the same.
ISI Certification	Smart Meters offered shall have Certification for 'ISI marking as per IS:16444 with latest amendment. The certification should be valid on the date of Tender opening.	Copy of Certificate for the Smart Meter offered should be furnished.

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Quality	The vendor should have valid ISO9001 & 14001 for the manufacturing facility.	ISO Certificate.
In-house Testing Facility	The bidder should have in-house Smart Meter Testing Facility for last 3 years.	Self-Undertaking and details of testing equipment's with make required
Capability to Handle Job financially if awarded	Average Annual turnover of the bidder for last three years shall not be less than Rs. 100 Crores.	Profit and Loss Statements, Balance Sheet, Cash Flow Statements for the Three (3) preceding financial years duly audited and approved by Authorized Audit Firm / CA.

Section A3: Price Bid Format (Pls refer Excel sheet enclosed with tender document)

A	Supply of Smart Meters with NIC	UOM	Qty	Unit Price	GST @18%	Total Value with GST
1	Single Phase 10-60A Whole Current Smart Meter with NIC	EA	10,000	0	-	
2	Three Phase 10-100A Whole Current Smart Meter with NIC	EA	5,000	0	-	
	Total Value with GST					

B	FMS - 1 Year	UOM	Qty	Per meter/per month	GST @18%	Total Value with GST
1	per meter per month	EA	165,000	0	-	0
	Total Value with GST					
	Total Value of Smart Meters & FMS with GST					**0**

Section A4 : Query / Clarification / Deviation Format – Please refer Excel Sheet.

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Section A5: SPECIAL CONDITIONS OF CONTRACT

Sr. No.	TOPIC	PRINCIPLES OF TERMS & CONDITIONS
1	GENERAL	The following **Special Conditions of Contract (SCC)** shall supplement the General Conditions of Contract. Wherever there is a conflict, the provisions herein shall prevail over those in the "General Conditions of Contract" (GCC).
2	CONTRACT PRICE AND CONTRACT STRUCTURE	The Price Bid shall remain valid for **180 days** from the due date of submission of the bid. Price submitted as part of E-auction / Negotiation shall remain valid for **90 days** from date of E-auction / Negotiation. Notwithstanding clause above, Tata Power 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 Bidders to quote for the package on Firm Price basis. The prices shall remain firm during the entire contract period and no price variation is applicable.
3	COMMENCEMENT / EFFECTIVE DATE (Note: It is to be noted that commencement date, effective date and notice to proceed are one and the same.)	The bidder will commence work / manufacturing of equipment on issue of Letter of Award (LOA) / Firm Purchase Order by TATA POWER and notice to proceed by the Order Manager. No equipment shall be delivered without specific dispatch clearance from project Manager TATA POWER.
4	CONTRACT PERFORMANCE BANK GUARANTEE	This is as per General Conditions of Contract clause 13.2. Successful bidder shall submit CPBG cum PBG for 10% of Contract Value in format specified by Tata Power respective discoms valid till the warranty period (as per Specs guarantee period) within 15 days after placement of confirmed Purchase

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		Order.
5	TERMS OF PAYMENT	100% of payment of the CRO shall be released within 90 days of submission of invoice & Submission of 10% CPBG cum PBG within 15 days from date of CRO valid till the warranty period.
6	INSURANCE	This is further to General Conditions of Contract clause 6.0, complete insurance will be in bidder's scope.
7	PENALTY/ LIQUIDATED DAMAGES FOR DELAYS, NON – PERFORMANCE & OVERALL CAP	This is further to General Conditions of Contract clause
8	DELIVERY PERIOD	Initially for 1st lot Delivery of Smart Meter shall be within 3 Months from Order. Bidder will have to submit delivery plan per month for future delivery.
9	WARRANTY PERIOD	As per the Specification guarantee period Clause No 9
10	Total Compliance to TCOC, SHE and International Safety standards	Tata Power Contractor Safety Management (CSM) checklist is enclosed as Annex CSM format. Bidder shall have to abide fully without any deviation.
11	Special note for Statutory requirements related to contract workmen	In addition to all prevailing admin / statutory approvals bidder to take special note of following All employees should submit medical fitness on Form No 6. ESIC / PF is mandatory for all employees deputed for the project. Police Verification / Indemnity Bond to be produced for all employees working at site.

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Section A6 : Earnest Money Deposit Bank Guarantee Format

Note: a) Format shall be followed in toto

b) Claim period of six months must be kept up

c) The guarantee to be accompanied by the covering letter from the bank confirming the signatories to the guarantee on the Bank's letter head.

The Tata Power Co Ltd

34,Sant Tukaram Road

Carnac Bunder,

Mumbai 400 009

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.

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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 ____Days (__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.

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(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 lodgeable 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.

For any correspondence in relation to extension / invocation / discharge of bank guarantee

contact us at Tel No._____ and Bank branch email id_____

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Section A7 : FORMAT OF CONTRACT PERFORMANCE BANK GUARANTEE (CPBG) / PERFORMANCE BANK GUARANTEE

Note: a) Format shall be followed in toto

b) Claim period of six months must be kept up

c) The guarantee to be accompanied by the covering letter from the bank confirming the signatories to the guarantee on the Bank's letter head.

The Tata Power Co Ltd

34,Sant Tukaram Road

Carnac Bunder,

Mumbai 400 009

Our Letter of Guarantee No.....

Contract/Purchase Order No.....dated.....

1.0 You have entered into a Contract No..... with..... .....(hereinafter referred to as " the Vendor") for the supply and delivery of ..... (hereinafter referred to as "the said equipment") for the price and on the terms and conditions contained in the said contract.

2.0 In accordance with the terms of the said contract, " the Vendor" has agreed to furnish you with an irrevocable and unconditional bank guarantee in a form and from a bank acceptable to you as security for the due performance by " the Vendor" of all his contractual obligations under the said contract in an amount equal to 10% (ten percent) of the total value of the contract to be valid

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from the date of contract and up to 12 months from the date of satisfactory commissioning of the said equipment into service or 18 months from the date of delivery whichever is earlier.

3.0 In consideration thereof, we, ... hereby irrevocably and unconditionally guarantee to pay to you on demand and without demur and without reference to " the Vendor" such amount or amounts not exceeding the sum of Rs.....(Rupees ..... only) being 10% (ten percent) of the total value of the contract on receipt of your intimating that " the Vendor" has not fulfilled his contractual obligations. You shall be the sole judge for such non-fulfilment and " the Vendor" shall have no right to question such judgement.

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

5.0 This guarantee shall not be revoked without your express consent and shall not be affected by your granting time or any other indulgence to " the Vendor", which shall include but not be limited to, postponement from time to time of the exercise of any powers vested in you or any right which you may have against " the Vendor" and to exercise the same in any manner at any time and either to enforce or forbear to enforce any covenant contained or implied in the said contract or any other course or remedy or security available to you, and our Bank shall not be released from its obligations under this guarantee by your exercising any of your rights with reference to matters aforesaid or any of them or by reasons of any other act or forbearance or other acts of omission or commission on your part or any other indulgence shown by you or by any other matter or thing whatsoever which under the law would, but for this

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provision, have the effect of relieving our bank from its obligation under this guarantee.

6.0 We also agree that you shall be entitled at your option to enforce this guarantee against our bank as a principal debtor, in the first instance, notwithstanding any other security or guarantee that you may have in relation to " the Vendor" 's liabilities in respect of the premises.

7.0 This guarantee shall not be affected by any change in the constitution of our Bank or " the Vendor" or for any other reason whatsoever.

8.0 Any claim/extension under the guarantee can be lodged at issuing outstation branch or at Mumbai branch and also become payable at our issuing outstation bank or at the Mumbai branch as per confirmatory letter/letters of the concerned bank branches as attached. (This Confirmatory letter is to be obtained from Mumbai Branch by the vendor and submitted along with the Performance Bank Guarantee and is applicable for PBG submitted from Banks located outside Mumbai).

9.0 Notwithstanding anything herein contained, our liability under this guarantee is limited to Rs..... (Rupees .... only) and the guarantee will remain in force up to and including .....(Date) and shall be extended from time to time for such period or periods as may be desired by " the Vendor" .

10.0 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 end date) we shall be discharged from all liabilities under this guarantee thereafter.

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11.0 For any correspondence in relation to extension / invocation / discharge of bank guarantee contact us at Tel No._____and Bank branch email id_____

Dated at ..... , this ..... day of .....2020 .

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TECHNICAL SPECIFICATION

FOR

Single Phase

Class 1, 10/60 Amp,

Smart Whole Current Meter

Tata Power Company Ltd.

Meter management Department

Dharavi Receiving Station,

Matunga,

Mumbai – 400 019

Document No.	TPC\MTL\Single Phase\2019\01	Issue No.	01
		Issue Date	25.09.2019
Revision No.	01	Revision Date	08.06.2022
Description	Prepared By & Date	Reviewed By & Date	Approved By & Date
SPECIFICATION FOR SINGLE PHASE SMART DLMS METER	Himali Patel	Devanjan Dey	S V Savarkar

Revision Summary

Revision No.	Revision Details	Revision Date	Reviewed & Approved By
01	Clause No. 4.31, 4.32, 12.4, 12.7 is modified to include common BCS compatibility, various program feature, load limit profile.	15.10.2020	N Manjunath J S Wadhwa

02	Modified/ Added DIP(Demand Integration Period) and SIP(Survey Integration Period), Latest IS no., Power consumption limit, Change of display sequence through firmware, Additional display sequence for Net meter and LT 2 part, self diagnostics list for LCD segment check, RTC limit, RTC sync, KVAH logic availability in BCS, NIC with 4G LTE with fallback to 2G, measuring element in Phase and neutral circuit, Logging of load switch, UC1 category, NIC module design and integration removed from meter specs, Magnetic tamper, ESD tamper, ND tamper, single wire tamper, Nomenclature for events, compartment size, tamper threshold table, optical port with metallic, encapsulated design of meter body, TPC hologram seal to vendor, Meter category in nameplate, pre dispatch inspection, meter guarantee as 60 months, CAPA of defective meter, latent defect.	08.06.2022	Devanjan Dey S V Savarkar

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1 Scope:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site of LT Single phase Two Wire, 10-60 A static meters of accuracy class 1.0, with inbuilt load switch and a two way communication with Head End System (HES) (here after referred as meters) complete with all accessories for efficient and trouble free operation.

2 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.

a) IS 16444 Part-1 2015) : A.C. Static Direct connected Watt hour Smart meter class 1.0 and 2.0
b) IS 13779 (2020) :A.C. Static Watt hour meter class 1.0 and 2.0
c) IS 15884 (2010) : A.C. direct connected static prepayment meters for active energy (CL 1 & 2)
d) IS 15959(Part 1-2011) : Data exchange for electricity meter reading, tariff and load control
e) IS 15959(Part 2-2016) : Data exchange for electricity meter reading , tariff and load control
f) IEEE 802.15.4(2003) : Standard for local and metropolitan area networks
g) IS 9000 : Basic Environmental testing procedure for electrical and electronic items.
h) IS 12346 (1999) : Specification for testing equipment for A.C.Electrical energy meter.
i) IS11000 (1984) : Fire hazard testing
j) IEC 62052-11 *(2003)* :Electricity Requirements (AC) General Requirements Tests and Test conditions for A.C.Static Watt hour meter for active energy Class 1.0 and 2.0.
k) IEC 62053-21 (2003) : A.C.Static Watt hour meter for active energy Class 1.0 and 2.0
l) IS 15707 (2006) : Testing Evaluation installation and maintenance of AC Electricity Meters-Code of practice.
m) IEC 60068 : Environmental testing.
n) CBIP – TR No.325 : Specification for A.C.Static Electrical Energy Meters (latest amendment).
o) CEA Regulation (2006) : Installation and operation of meters Dtd: 17/03/2006.
p) IS 60529 : Degree of protection provided by enclosure

3 Climatic Conditions of The Installation:

a) Max. Ambient Temperature : 50 deg.C
b) Max. Daily average ambient temp. : 40 deg.C
c) Min Ambient Temp : 0 deg C
d) Maximum Humidity : 95%
e) Minimum Humidity : 10%
f) Average No. of thunderstorm days per annum : 50
g) Maximum Annual Rainfall : 1450 mm
h) Average No. of rainy days per annum : 60
i) Rainy months : June to Oct.
j) Altitude above MSL not exceeding : 300 meters
k) Wind Pressure : 150 kg/sq m

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and

accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3 g.

4 General Technical Requirements:

S.No.	DESCRIPTION	REQUIREMENT
4.1	Type of the meter	Single phase two wire , whole current meter- direct reading type without application of any multiplication constant. It also Consists of measuring elements, TOU of register, Display, load switch and plug in type bi-directional communication module all integral within the meter.
4.2	Accuracy Class of the meter	1.0
4.3	Basic Current (Ib) & rated Maximum current (Imax)	Ib= 10A; Imax= 60 Amps (Meter shall be able to continuously carry 120% of Imax Meet the accuracy requirements)
4.4	Reference Conditions for testing the performance of the meter	Vref = 240 V $\pm$ 1 % Frequency = 50 Hz $\pm$ 0.3% Temperature= 27 ^{0}C $\pm$ 2 ^{0}C (if the tests are made at the temperature other than reference temperature the results shall be corrected by applying Mean Temperature Coefficient 0.05)
4.5	Operating Voltage	Meter shall be operational with required accuracy from 0.6 Vref to 1.2 Vref. However meter shall withstand the maximum system Voltage of 440 V (for minimum 5 min)
4.6	Operating Frequency	50 Hz$\pm$ 5%.
4.7	Power Consumption	Voltage circuit: Maximum 5.0 W and 15 VA Current Circuit :0.08% Vref*Imax (The additional power requirement during data transmission shall not exceed 7W per communication module).
4.8	Starting Current	20mA (0.2% of Ib)
4.9	Short time over current	1800 A for 0.01 sec (30Imax for one half cycle at rated frequency)
4.10	Influence of heating	Temperature rise at any point of the external surface of the meter shall not exceed by more than 20K with an ambient temperature at 45^0 C.
4.11	Rated Impulse withstand voltage	6KV (shall be applied ten times with one polarity and then repeated with the other polarity.)
4.12	AC withstand voltage for 1 min	4 KV
4.13	Insulation resistance at test voltage 500+/- 50 V dc A)Between frame &current ,voltage circuits as well as auxiliary circuits connected Together	5 M ohm.

4.14	Mechanical requirements	Meter shall be in compliance with clause 12.3 of IS 13779
4.15	Resistance to heat and fire	The terminal block and Meter case shall ensure safety against The spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per IS 13779. Fire retardant material shall be used.
4.16	Protection against penetration of dust and water.	Degree of protection :IP 51 or better as per IS 12063/60529, but without suction in the meter. Meter shall comply with clause 6.9 and 12.5 of IS 13779
4.17	Resistance against Climatic influence.	Meter shall be in compliance with clause 12.6 of IS 13779.
4.18	Electromagnetic Compatibility (EMC)	Meter shall be in compliance with clause 4.5 and 5.5 of IS 15884
4.19	Accuracy requirements	Meter shall be in compliance with clause 11 of IS 13779.
4.20	Power factor range	Zero lag to Zero lead.
4.21	Energy measurement	Fundamental energy +Energy due to Harmonics
4.22	Connection Diagram	The connection diagram for the system shall be provided on terminal cover.
4.23	Self-Diagnostic feature	The meter shall have indications for un satisfactory/non-functioning of (i) Real Time Clock and calendar (ii) RTC battery (iii) Non Volatile Memory (iv) LCD segment check (v) Communication Card
4.24	Initial startup of meter	Meter shall be fully functional within 5 sec after reference Voltage is applied to the meter terminals.
4.25	Alternate mode of supply to the meters	In case of power failure, reading/data shall be to downloaded with the help of battery of long life(minimum ten years) through Optical port in Battery mode.
4.26	Sleep Mode	Meter shall not go in sleep mode .Display should not be "OFF at any point of time when power up.
4.27	Internal diameter of the terminal holes Depth of the terminal holes	9.5mm (minimum) 25 mm
4.28	Clearance between adjacent terminals	10 mm (minimum)
4.29	Display	Backlit LCD, Scrolling, 10 seconds for each parameter minimum 6 Digits LCD display. The back lit must be green in color
4.30	Security feature	Programmable facility to restrict the access to the information recorded at different security level such as read communication, write communication
4.31	Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non-smart & upcoming smart meters) can be read through one BCS only.
4.32	Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing

		& load survey), MD reset, billing date change, relay connect/Disconnect, Set load limit, Pre paid/post paid, Set metering mode (Import/Export), display setting, shall be reconfigure through BCS/CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to TATA power till the useful life of the meters. Change in display setting shall be done through firmware upgrade by means of BCS/CMRI and remotely over the air (OTA). Meter data will not get reset while firmware upgrade. Display sequence for different categories like Net meter and LT2 part is given in the document.
4.33	Usage Application	Indoor and Outdoor
4.34	Ultrasonic welding	Meter cover and body should be Ultrasonic/chemical welded.
4.35	Meter Dimension in MM	Is not more than 170L*140W*100H
4.36	Real Time clock	Accuracy of RTC Should be as per CBIP-325 report and shall not vary by ± 7 min per year. Meter RTC shall be corrected automatically by the system in synchronization to the network RTC. Meter shall support RTC sync request from HES also.
4.37	No display	Meter design in such a way, meter data retrieved if meter found no display.
4.38	KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity. The same shall be displayed in BCS.
4.39	Communication module of meter for AMI	As per clause no 1.2 (b) of IS 16444. Meter should have provision of communication module compatible with both the variant mentioned in IS 16444 PART-1. The Communication Network Interface Card (NIC) shall be 4G LTE with fallback provision to 2G and support all the bands offered by TSP's in India. It should be plug-in type and field hot swappable with cellular technology NIC of all type of meters of same make. Support for upgrade to 5G should be there without replacing the meter. Meter should be able to provide required power supply to NIC card.
4.40	Communication Layer Protocol	Should be as per clause 9.3 of IS 16444 PART-1
4,41	Key Management and Security Feature	Should be as per IS 15959 Part-1 & Part- 2
4.42	Measuring element	Suitable CT/Shunt shall be provided in Phase and Neutral circuit
4.43	Meter Category	C3
4.44	Load switch utilization category	UC1 or better

5 Disconnector/Load Switch, NIC Module

Details & Integration & Communication capabilities and software Feasibilities:

5.1 Disconnector Switch

The meter shall have the facility of disconnecting and re-connecting the load of the meter from the remote and by authenticated command through Laptop/HHU at site by means of a built-in switch/relay.

This operation shall be conducted with the help of a third party software which is owned by TATA POWER and in addition to the manufacturer's own software, in Cellular (GPRS/ 3G / 4G / LTE) which can be given through optical port using external modem by utility.

Each operation of the switches shall be logged by the meter as an event with date and time stamp and reading parameters. This operation should be in line with clause 11 of IS 16444 PART-1, however over current tripping should be disabled by default while supply and should have easy enabling provision in feature. Enabling and Disabling configuration setting change By Tata Power whenever required remotely over the air (OTA). The Tata Power will decide the enabling of disconnection based on statuary guidelines and changes in future. The cumulative number of ON/OFF operations shall also be made available in meter data and HES.

Logging of load switch profile shall be made available at BCS//HES end alongwith date/time stamping & instantaneous parameters like voltage, current, energies (Kwh& KVAH).

The make of the load switch should be of reputed make like Grooner (German) or equivalent and same shall be confirmed by the bidder during tendering. Switch shall be in compliance to IS 15884. The brief technical particulars of this Disconnector/load switch are furnished below, bidders to comply for the same:-

S.No.	DESCRIPTION	REQUIREMENT
1	Operating Voltage range	130 V to 470 V
2	Operating Current range	20 mA to 72 A
3	Maximum switching power	22 kVA per phase/ per IS 15884 Annex G
4	No. of poles	2 nos (one in phase and one in neutral)
5	Operation of switches	Simultaneous
6	Utilization Categories	UC1 or better
7	Min. number of operation	3000 (close, open each)

6 Immunity against external influencing signals:

6.1 Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with latest CBIP amendment. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

a) Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate
b) Meter shall show "Magnet" or appropriate icon in the display

Abnormal Magnetic field is defined as below;

a) Continuous DC magnetic induction: >0.2 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.2 Tesla)
b) AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT
c) Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Consumption during magnet temper shall be recorded in defraud register also. Demand shall be recorded as per actual load only.

6.2 Electrostatic Discharge (ESD)

Meter along with NIC shall be immune up to 35 kV and shall record accurate energy as per IS-13779:2020. Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 35 kV and shall show 'ESD' in the display.

The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.

The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.

The meter should be immune or log the tamper on application of any other higher magnetic field of any frequency waves, micro waves.

6.3 Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 1 min and for Pulsating DC and Chopped AC of any value with time delay of 1 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 1 min(occurrences and restoration time).

The meter shall record energy proportional to the current, V Ref (240V) and UPF when any of the tamper circuits enclosed as per annexure are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device and meter should recorded ND in meter memory. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

6.4 Single Wire

Single Wire tamper (Neutral Missing): When neutral is disconnected from both load side and supply side, the meter should record energy as per rated parameters (Vref), UPF. However, meter shall start registering energy

a) At a current of >1 A under tamper condition of neutral missing (where battery is used for voltage reference). Meter will perform the fraud energy registration above 1 A assuming Vref (from battery) and Unity power factor.
b) Condition no. 38 of Annexure I (Timer test) : The timer operation duration shall be 30 seconds.

6.5 Abnormal and Tamper conditions:

The meter shall record forward energy under any abnormal conditions as given in the annexure I.

All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral), energy, pf)

Meter shall store cumulative count and cumulative durations of all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time
Stamp on FIFO basis. The event of which the restoration not occurred those should not be removed from meter memory and FIFO should not applicable for unrestored event.

The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not operate on vibration or impact during handling or testing.

Meter shall have neutral CT for tamper identification and analysis.

The size of compartments should be such that all above event are accommodated in the assigned event compartment. i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table.

All Transactional/Programing related events and Control events for Connect/Disconnect to be logged in BCS/HES along with date/time stamping and instantaneous parameters.
Suitable nomenclature/icon shall be displayed on meter display for Magnet, HV ESD, Neutral Disturbance, Single wire, Meter cover open related events.

Persistence time for occurrence and restoration for the events and compartment block size shall be as per table given.

Compartment size	
Voltage related events	100
Current related events	100
Power failure related events	30
Transaction related events	20
Other events	50
Non-rollover events	1
Control events for Connect/Disconnect	10

Compartment	Event Description	occurrence	Time for occurrence	Restoration	Time for restoration
1	Current reversal	Active current negative	2 Min		2 Min
2	Over current	> 61 Amp	2 Min	=< 60 Amp	2 Min
3	Current mismatch	In-Ip >= 20% Ib and In>Ip	2 Min	In-Ip<20% Ib	2 Min
4	Earth Load	Difference between Phase and Neutral current more than 10%	5 Min	Difference between Phase and Neutral current less than 10%	5 Min
5	Single Wire / Neutral Cut / Netural missing	If neutral is removed and current drawn > 10%Ib in other wire	1 Min	If neutral is restored and meter is in normal condition	1 Min
6	Neutral Disturbance	(1) Vph > 150% Vref OR (2) In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode) OR both above	1 min	If meter is in normal condition	1 Min
7	H.V. Tamper	Vph > 110% of Vref	5 min	Vph < 110% of Vref	5 min
8	Low Voltage	< 216 V	30 min	> 216 V	5 min
9	ESD/JAMMER Tamper	> 35 KV	immediate	Removal of ESD/Jammer signal	immediate
10	Magnet	Whenever meter sense abnormal magnetic field it shall record Active and Apparent energy at Imax at UPF	immediate	If magnet is removed and meter is in normal condition	immediate
11	Power On/OFF	Actual voltage Off.	60 sec		immediate
12	Cover Open	When cover opens by more than 2 to 4 mm.	Immd	Non Roll over event	
13	Temperature Rise	Occ: T > 70˚C REC: T < 60˚C	2		
14	NIC card Removed (Immediate)	OCC: On removal of card RES: On Insertion card	Immediate		

7 General Technical Requirements

The Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against electric shock, safety against effect of excessive temperature, protection against spread of fire, protection against penetration of solid objects, dust and water.

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. Meter shall withstand Solar radiation.

The meters shall be designed and manufactured using SMT (Surface Mount Technology) components

All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy as given below or any other equivalent make with the strict approval of Purchaser:

S No	Component Function	Requirement	Makes and Origin
1.	Measurement/ computing chips	The Measurement/ computing chips used in the meter should be with the Surface mount type along with the ASICs	USA: Anolog Devices, Cyrus Logic, Atmel, Phillips South Africa: SAMES Japan: NEC
2.	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel, National Semiconductors, Texas Instruments, Phillips Japan:Hitachi or Oki
3.	Display modules	The display modules should be well protected from the external UV radiations. The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The construction of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial grade with extended temperature range.	Taiwan: Holtek Singapore: Bonafied Technologies Korea: Advantek China:Xiamen
4.	Optical port	Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	USA: National Semiconductors Holland / Korea: Phillips Taiwan: MAXIM Japan:Hitachi
5	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm	A class vendor

6.	Electronic components	The active & passive components should be of the surface mount type & are to be handLead & soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Phillips, Texas Instruments Japan:Hitachi, Oki, AVX or Ricoh Korea: Samsung
7.	Battery	Lithium with guaranteed life of 15 years	Varta / Tedirun /Sanyo or equivalent.
8.	RTC / Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	USA: Philips , Dallas, Atmel, Motorola Japan: NEC or Oki
9.	Temperature Sensor	Temperature sensor shall be internal to the meter and its accuracy shall be as per relevant IEC / IS standards. The OEM test report to be furnished. With good performance till life of meter.	USA: Philips , Dallas, Atmel, Motorola Japan: NEC or Oki

Note: The makes of the components are in the preferential order.
Vendor shall submit list of components with makes to TPC during sample meter evaluation and FAT.

8 Meter Body:

Meter body shall be made of unbreakable, high grade, fire retardant reinforced Insulating material (protective Class II)with FVo Fire Retardant, self extinguishing, UV stabilize, recyclable and Anti oxidation properties. The minimum thickness of the meter enclosure shall be 2mm. Meter base shall be opaque with polycarbonate LEXAN 500R or better on prior approval from the Purchaser.

Meter cover shall be transparent with polycarbonate LEXAN 143R/943A or equivalent on prior approval from the Purchaser. Meter cover & base shall be provided with continuous and seamless Ultrasonic/chemical welding such that it is not opened without breaking the enclosure. Front cover & base shall be such that it is not possible to cut & open the meter without certainly damaging the meter body and by no means shall an attempt to reassemble would not leave physical evidence. The damage evidence should be visible externally & should be traceable in such a way that attempts can be proved in court of law. The meter body shall be sealed in such a way that opening of meter base and cover is possible only after breaking the seal(s). Unidirectional screws to be used on meter covers where ever required.

However meter with opaque encapsulated design/integrated base and cover (single enclosure) would be highly preferred, thus nullifying the possibility of opening of meter case.

The Meter body shall be such that the liquid or chemical shall not reach the electronic parts if liquid is injected from any side of meter body such as meter terminals, push button, display, NIC card casing, necessary protection and water tight sealing to be provided at terminals and Push buttons .
Optical port of meter shall be metallic to hold magnetic optical cord during data downloading locally.

9 Terminals, Terminal Block

Terminal block should be in single mould with meter body base(Not separate). After any attempts the terminal block should not be able to disengaged, opened or loosen from any side. Any attempt to disengage the terminal block should certainly damage the meter body with physical evidences. The damage evidences should be visible externally& should be traceable in such a way that attempts can be proved in court of law

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

Terminal block and terminal cover shall be of a material which complies with the requirements of IS11731 (part 1) method FH1. The material of which the terminal block is made shall be capable of passing the test given in ISO 75 for temperature of 180°C and pressure of 1.8 M Pa. Tested as per ISO 75-2/A or ASTM D648. The terminal block shall be of opaque with polycarbonate LEXAN500R or equivalent on prior approval from the Purchaser

The terminals shall be marked properly on the terminal block for making external connections.

The terminals and connections shall be suitable to carry up to 120 % of Imax continuously (Imax 60 A).
The terminal block, the terminal cover and the meter case shall ensure reasonable safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them.

Temperature sensor to be provided from inside near the terminal block and precisely placed near incoming terminals of the energy meter for sensing the temperature and meter should be programmed in such way that on reaching the threshold value set (as per tamper table) the event/alert should go the to HES/MDMS

The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Terminals shall be preferably of MS cage clamp type as per IS: 15707or of flat end screw with at least 6 mm dia of screw for better contact area.

Internal diameter of the terminal holes shall be minimum 9.5 mm; minimum clearance between adjacent terminals shall be 10 mm. Depth of the terminal holes shall be of 25 mm. Terminal screws shall be of Zinc plated MS bottle type.

Terminal block shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.

The preferred arrangement of terminals shall be linear. Minimum two number of terminal screws to be provided per terminal wire

9.1 Terminal Cover:

Terminal cover shall be of short type and shall be transparent with polycarbonate LEXAN 143R/943A or equivalent on prior approval from the Purchaser. Appropriate space shall be available for incoming /outgoing cables without damaging/stressing terminal cover (terminal cover design shall be as per the Purchaser approval). After sealing the cover, terminals shall not be accessible without breaking the seals. Terminal Cover with C cut to enable smooth insertion of cable in the terminals.

Length of terminal cover shall not be more than 25 mm from bottom of terminal block in line with meter base.

The terminal cover should open on the top side, during connection of the cables. The side opening of terminal cover is not acceptable due to additional opening space requirement.

9.2 Sealing of meter

Reliable sealing arrangement shall be provided to make the meter tamper evident and to avoid fiddling or tampering by unauthorized persons. For this, one no. Polycarbonate seal left side and one no. Hologram seal on right side shall be provided by the Bidder.
Additional Hologram seals will be provided by TPC to supplier for putting them on meter body as per requirement.
All the seals shall be fixed on meter body by the bidder at his works before dispatch.

One sealing provision shall be provided at meter terminal cover, such that terminal shall not be accessible without breaking the seals. All the seals shall be provided on

front side only and as per the Purchaser specification. Rear side sealing arrangement shall not be accepted. Bidder shall provide seals be as per CEA regulation (2006). Only patented seals to be used as per CEA requirements.

Plug in type NIC card cover should have proper sealing arrangement and should be sealed with manufacturer's polycarbonate seal.

The bidder shall provide the soft record of polycarbonate seal, Manufacturers and TPC hologram seal serial number, NIC card serial number and box packing list used against each meter serial number along with its position in tabular form for every lot of meter.

The manufacture should provide manufacture Hologram seal as and when required by TPC within week.

10 TOD Feature:

The meter shall be capable of measuring Cumulative Energy (KWh), Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by BCS/CMRI/OTA with adequate security level).
TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs
TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

11 MD Integration:

The MD integration period shall be 15 minutes. The MD resetting shall be automatic at the 1st of the month i.e. 0000 hours of 1st day of the month. Manual MD reset button shall not be available. Last 12 MD values shall be stored in the memory. MD shall be recorded and displayed with minimum three digits before decimal and minimum two digits after decimal points. MD integration shall be Block Type Demand.

12 Parameters In BCS

All these parameters shall be downloaded locally or remotely. All the parameters shall be recorded in its NVM(Non Volatile Memory). NVM shall have minimum retention time of 10 Years. Below mention current, history billing data and at least 25 tamper event for each tamper shall be available In NVM.

12.1 Billing Information

Current+ 12 History billing Date
Current + 12 Month History of Energy (KWH, KVAH, KVARH Lag, KVARH Lead, Def KWH, Def KVAH)
Current + 12 Month History Consumption (KWH, KVAH, KVARH Lag, KVARH Lead, Def KWH, Def KVAH)
Current + 12 Month History of Demand (KW,KVA, KVAR Lag, KVAR Lead) Along with date and time stamp
Current + 12 Month History of PF
Current + 12 Month History of Disconnector switch cumulative count.

TOD wise billing Information
Current + 12 Month History of Energy (KWH, KVAH)
Current + 12 Month History of Consumption (KWH, KVAH)
Current + 12 Month History of Demand (KW, KVA) along with date and time stamp
Current + 12 Month History of PF

12.2 Load survey:

The meter shall be capable of recording load profile of atleast 45 days for 15 min IP for ON days only for following parameters.

Voltage
Phase Current
Neutral Current
PF
KWH
KVAH
KW
KVA
Temperature

12.3 MID Night Energy:

Meter shall be capable of recording daily Midnight Energy(KWH, KVAH) 00:00 to 24:00 Hrs for 90 power ON days.

12.4 Instantaneous Parameters:

Meter shall have capable following Instantaneous parameter In Memory and should be available in BCS
Meter Serial No

Meter Type
Meter date and Time
MRI date and time
Dump date and time
Voltage
Phase Current
Neutral current
Power Factor
Instantaneous Frequency
Instantaneous Load (KW, KVA, KVAR Lag, KVAR Lead)
Present Cumulative energy (KWH, KVAH, KVARH Lag, KVARH Lead, Def KWH, Def KVAH)
Cumulative Tamper count
Cumulative Billing Count
Terminal Block Temperature
No. of disconnector switch operation Count
Load limit value in KW

12.5 General Information:-

Meter shall be capable for providing below mention general parameters in memory should be available in BCS

Meter serial No
Meter Type
Manufacture Name
Manufacture date
Meter Class
Meter constant
Meter voltage rating
Meter current rating
Firmware version of meter
Available TOD profile showing timing and seasons
Available Meter display sequence

12.6 Transactions:-

All the change in software of meter to be logged along with date and time stamp and instantaneous parameters.

12.7 Load switch profile:-

All energy & demand parameters alongwith date time stamping shall be available with status of Relay connect/disconnect.

13 Display units:

The display unit shall be Pin type built-in liquid crystal display (Permanently backlit type LCD). The LCD shall be of STN (Super Twisted Nematic) construction suitable for maximum temperature withstands 65 C degree and minimum temperature withstands 0degree C during normal operating condition. The LCD display shall have a wide viewing angle of 120 degree. When the meter is not energized the electronic display need not be visible. The display shall not be affected by electrical, magnetic disturbances and ESD. The back lit must be green in color while in normal registration modes.

The KWh register shall have minimum 6 digits and size of the digits shall be minimum 10mmx6mm. Cumulative energy (KWh) shall be displayed without decimal in auto scroll mode. (However decimal shall be available in push button mode for high resolution display for testing)

Persistence time for each parameter shall be 10 second. Values followed by header shall be avoided. (I.e. if MD1 is displayed in Auto scroll mode, Header (MD1) and value (say 5.23 KW) shall be shown simultaneously; it shall not be shown in successive displays. Off time shall not be available in auto scroll mode between each cycle. Auto scroll mode is restored after 30 sec, if push button is not operated.

1. **Default Display sequence –**

Display1 Parameters (Auto Scroll Mode)
Cumulative Forward kWh (6+0)

Display2 Parameters (Manual Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Voltage
Instantaneous Phase Current
Instantaneous Neutral Current
Instantaneous P.F
Instantaneous Active power (3+3)
Instantaneous Apparent power (3+3)
Instantaneous Reactive power (3+3) (Lag or Lead)
Cumulative Forward kWh (6+0)

TOD 1 Forward kWh
TOD 2 Forward kWh
TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag (6+0)
Tariff wise MD Forward KVA Date & time
Cumulative Forward kVArh lead (6+0)
Cumulative Forward kVAh (6+0)
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh
TOD 1 Frozen Maximum demand in Forward kW with date & time
TOD 2 Frozen Maximum demand in Forward kW with date & time
TOD 3 Frozen Maximum demand in Forward kW with date & time
TOD 4 Frozen Maximum demand in Forward kW with date & time
TOD 5 Frozen Maximum demand in Forward kW with date & time
TOD 1 Frozen Maximum demand in Forward kVA with date & time
TOD 2 Frozen Maximum demand in Forward kVA with date & time
TOD 3 Frozen Maximum demand in Forward kVA with date & time
TOD 4 Frozen Maximum demand in Forward kVA with date & time
TOD 5 Frozen Maximum demand in Forward kVA with date & time
Frozen energy in Forward kWh for last 6 reset
Frozen energy in Forward kVAh for last 6 reset
Frozen Maximum demand in Forward kW for last 6 reset
Frozen Maximum demand in Forward kVA for last 6 reset
Rising Demand Forward kW along with time elapsed.
Cumulative Tamper Count
History of last 3 tampers occurrence & recovery
Defraud Register Cumulative kWh during Magnetic Tamper (6+0)
Defraud Register Cumulative kWh during ND Tamper (6+0)
Defraud Register Cumulative kWh during NM Tamper (6+0)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest Neutral Disturbance occurrence date & time
Latest Neutral Disturbance recovery date & time
Latest Neutral Missing occurrence date & time
Latest Neutral Missing recovery date & time
Cover Open tamper occurrence Date (If Occurred Only)
Cover Open tamper occurrence Time (If Occurred Only)
Status of Load Switch

Count of Relay connect
Relay connect Date of last occurrence
Relay connect Time of last occurrence
Count of Relay disconnect
Relay disconnect Date of last occurrence
Relay disconnect Time of last occurrence
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display 3 Parameters (High Resolution Mode)
Cumulative Forward kWh (2+4)
TOD 1 Forward kWh (6+0)
TOD 2 Forward kWh (6+0)
TOD 3 Forward kWh (6+0)
TOD 4 Forward kWh (6+0)
TOD 5 Forward kWh (6+0)
Cumulative Forward kVArh lag (2+4)
Cumulative Forward kVArh lead (2+4)
Cumulative Forward kVAh (2+4)
TOD 1 Forward kVAh (6+0)
TOD 2 Forward kVAh (6+0)
TOD 3 Forward kVAh (6+0)
TOD 4 Forward kVAh (6+0)
TOD 5 Forward kVAh (6+0)
Frozen Maximum demand in Forward kW for last 6 reset with date & time
Frozen Maximum demand in Forward kVA for last 6 reset with date & time

Battery mode will be as per display 3.

2. **Display sequence for LT 2 part (programmable through firmware upgrade) –**

Display1 Parameters (Auto Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Cumulative Forward kWh (6+0)
TOD 1 Forward kWh
TOD 2 Forward kWh

TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag
Tariff wise MD Forward kVA Date & time
Cumulative Forward kVArh lead
Cumulative Forward kVAh
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh

Display2 Parameters (Manual Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Voltage
Instantaneous Phase Current
Instantaneous Neutral Current
Instantaneous P.F
Instantaneous Active power (3+3)
Instantaneous Apparent power (3+3)
Instantaneous Reactive power (3+3) (Lag or Lead)
Cumulative Forward kWh (6+0)
TOD 1 Forward kWh
TOD 2 Forward kWh
TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag
Tariff wise MD Forward KVA Date & time
Cumulative Forward kVArh lead
Cumulative Forward kVAh
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh
Latest reset- Forward kWh
Latest reset-TOD 1 Forward kWh

Latest reset-TOD 2 Forward kWh
Latest reset-TOD 3 Forward kWh
Latest reset-TOD 4 Forward kWh
Latest reset-TOD 5 Forward kWh
Latest reset- Forward kVArh lag
Latest reset-Tariff wise MD Forward kVA Date & time
Latest reset- Forward kVArh lead
Latest reset- Forward kVAh
Latest reset-TOD 1 Forward kVAh
Latest reset-TOD 2 Forward kVAh
Latest reset-TOD 3 Forward kVAh
Latest reset-TOD 4 Forward kVAh
Latest reset-TOD 5 Forward kVAh
Frozen energy in Forward kWh for last 6 reset
Frozen energy in Forward kVAh for last 6 reset
Frozen Maximum demand in Forward kW for last 6 reset
Frozen Maximum demand in Forward kVA for last 6 reset
Rising Demand Forward kW along with time elapsed.
Cumulative Tamper Count
History of last 3 tampers occurrence & recovery
Defraud Register Cumulative kWh during Magnetic Tamper (6+0)
Defraud Register Cumulative kWh during ND Tamper (6+0)
Defraud Register Cumulative kWh during NM Tamper (6+0)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest Neutral Disturbance occurrence date & time
Latest Neutral Disturbance recovery date & time
Latest Neutral Missing occurrence date & time
Latest Neutral Missing recovery date & time
Cover Open tamper occurrence Date (If Occurred Only)
Cover Open tamper occurrence Time (If Occurred Only)
Status of Load Switch
Count of Relay connect
Relay connect Date of last occurrence
Relay connect Time of last occurrence
Count of Relay disconnect
Relay disconnect Date of last occurrence
Relay disconnect Time of last occurrence
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status

NIC card status
RSSI Value

Display 3 Parameters (High Resolution Mode)
Cumulative Forward kWh (2+4)
Cumulative Forward kVArh lag (2+4)
Cumulative Forward kVArh lead (2+4)
Cumulative Forward kVAh (2+4)

Battery mode will be as per display 3.

3. **Display sequence for Net meter (programmable through firmware upgrade) –**

Display1 Parameters (Auto Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Cumulative kWh (6+0) - Import
TOD 1 kWh - Import
TOD 2 kWh - Import
TOD 3 kWh - Import
TOD 4 kWh - Import
TOD 5 kWh - Import
Cumulative kVArh lag - Import
Tariff wise MD kVA Date & time - Import
Cumulative kVArh lead - Import
Cumulative kVAh - Import
TOD 1 kVAh - Import
TOD 2 kVAh - Import
TOD 3 kVAh - Import
TOD 4 kVAh - Import
TOD 5 kVAh - Import
Cumulative kWh (6+0) - Export
TOD 1 kWh - Export
TOD 2 kWh - Export
TOD 3 kWh - Export
TOD 4 kWh - Export
TOD 5 kWh - Export
Cumulative kVArh lag - Export
Tariff wise MD kVA Date & time - Export
Cumulative kVArh lead - Export
Cumulative kVAh - Export

TOD 1 kVAh - Export
TOD 2 kVAh - Export
TOD 3 kVAh - Export
TOD 4 kVAh - Export
TOD 5 kVAh - Export

Display2 Parameters (Manual Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Voltage
Instantaneous Phase Current
Instantaneous Neutral Current
Instantaneous P.F
Instantaneous Active power (3+3)
Instantaneous Apparent power (3+3)
Instantaneous Reactive power (3+3) (Lag or Lead)
Cumulative kWh (6+0) - Import
TOD 1 kWh - Import
TOD 2 kWh - Import
TOD 3 kWh - Import
TOD 4 kWh - Import
TOD 5 kWh - Import
Cumulative kVArh lag - Import
Tariff wise MD kVA Date & time - Import
Cumulative kVArh lead - Import
Cumulative kVAh - Import
TOD 1 kVAh - Import
TOD 2 kVAh - Import
TOD 3 kVAh - Import
TOD 4 kVAh - Import
TOD 5 kVAh - Import
Cumulative kWh (6+0) - Export
TOD 1 kWh - Export
TOD 2 kWh - Export
TOD 3 kWh - Export
TOD 4 kWh - Export
TOD 5 kWh - Export
Cumulative kVArh lag - Export
Tariff wise MD kVA Date & time - Export
Cumulative kVArh lead - Export

Cumulative kVAh - Export
TOD 1 kVAh - Export
TOD 2 kVAh - Export
TOD 3 kVAh - Export
TOD 4 kVAh - Export
TOD 5 kVAh - Export
Latest reset- Cumulative kWh (6+0) - Import
Latest reset- TOD 1 kWh - Import
Latest reset- TOD 2 kWh - Import
Latest reset- TOD 3 kWh - Import
Latest reset- TOD 4 kWh - Import
Latest reset- TOD 5 kWh - Import
Latest reset- Cumulative kVArh lag - Import
Latest reset- Tariff wise MD kVA Date & time - Import
Latest reset- Cumulative kVArh lead - Import
Latest reset- Cumulative kVAh - Import
Latest reset- TOD 1 kVAh - Import
Latest reset- TOD 2 kVAh - Import
Latest reset- TOD 3 kVAh - Import
Latest reset- TOD 4 kVAh - Import
Latest reset- TOD 5 kVAh - Import
Latest reset- Cumulative kWh (6+0) - Export
Latest reset- TOD 1 kWh - Export
Latest reset- TOD 2 kWh - Export
Latest reset- TOD 3 kWh - Export
Latest reset- TOD 4 kWh - Export
Latest reset- TOD 5 kWh - Export
Latest reset- Cumulative kVArh lag - Export
Latest reset- Tariff wise MD kVA Date & time - Export
Latest reset- Cumulative kVArh lead - Export
Latest reset- Cumulative kVAh - Export
Latest reset- TOD 1 kVAh - Export
Latest reset- TOD 2 kVAh - Export
Latest reset- TOD 3 kVAh - Export
Latest reset- TOD 4 kVAh - Export
Latest reset- TOD 5 kVAh - Export
Frozen energy in kWh for last 6 reset- Import
Frozen energy in kVAh for last 6 reset- Import
Frozen Maximum demand in kW for last 6 reset- Import
Frozen Maximum demand in kVA for last 6 reset- Import
Frozen energy in kWh for last 6 reset- Export
Frozen energy in kVAh for last 6 reset- Export
Frozen Maximum demand in kW for last 6 reset- Export

Frozen Maximum demand in kVA for last 6 reset- Export
Rising Demand Forward kW along with time elapsed.
Cumulative Tamper Count
History of last 3 tampers occurrence & recovery
Defraud Register Cumulative kWh during Magnetic Tamper (6+0)
Defraud Register Cumulative kWh during ND Tamper (6+0)
Defraud Register Cumulative kWh during NM Tamper (6+0)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest Neutral Disturbance occurrence date & time
Latest Neutral Disturbance recovery date & time
Latest Neutral Missing occurrence date & time
Latest Neutral Missing recovery date & time
Cover Open tamper occurrence Date (If Occurred Only)
Cover Open tamper occurrence Time (If Occurred Only)
Status of Load Switch
Count of Relay connect
Relay connect Date of last occurrence
Relay connect Time of last occurrence
Count of Relay disconnect
Relay disconnect Date of last occurrence
Relay disconnect Time of last occurrence
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display 3 Parameters (High Resolution Mode)
Cumulative Forward kWh (2+4) - Import
Cumulative Forward kVArh lag (2+4) - Import
Cumulative Forward kVArh lead (2+4) - Import
Cumulative Forward kVAh (2+4) - Import
Cumulative Forward kWh (2+4) - Export
Cumulative Forward kVArh lag (2+4) - Export
Cumulative Forward kVArh lead (2+4) - Export
Cumulative Forward kVAh (2+4) – Export
Battery mode will be as per display 3.

For Net meter mode, Both Import and export energy recording shall be applicable in this mode of metering and relevant registers like Billing, LS, tamper logics etc shall be updated and shall be available in BCS also.

Note: Latest reset or Frozen is History 1

All these parameters shall be downloaded locally or remotely and interpreted in PC/Laptop.

All the parameters shall be recorded and memorized in its Non Volatile Memory (NVM).The corresponding non-volatile memory shall have a minimum retention time of 10 years.

14 Output Device:

14.1 Pulse rate

The meters shall have a suitable test output device. Red color blinking LED (marked as imp/kWh) shall be provided in the front. This device shall be suitable for using with sensing probe used with test benches or reference standard meters. The test output device shall have constant pulse rate of 3200 pulse / kWh. Meter constant shall be indelibly printed on the name plate as 3200 imp / KWh.

14.2 Communication LCD indicator

The meter shall be provided with suitable LCD indication for communication in progress.
Meter shall display Communication status indications on LCD without affecting normal display parameters.

14.3 Load Switch LED indicator

The meter shall be provided with suitable LED indication for condition of load switch (Close/open). LCD should show when load switch is open.

15 Name plate and Marking:

Meters shall have a name plate clearly visible and effectively secured against removal. The name plate data should be laser printed. No sticker to be used to avoid loss of data in event of fire. The base color of Name plate shall be white indelibly and distinctly marked with all essential particulars as per relevant standards along with the following. The Serial no. series applicable for the meters shall be provided by Tata Power.

i. Manufacturer's name
ii. Type designation
iii. Number of phases and wires
iv. Serial number (Meter serial number shall be laser printed on name plate instead on sticker).
v. Serial number along with barcode
vi. Month and Year of manufacture
vii. Unit of measurement
viii. Reference voltage ,frequency
ix. Ref. temperature
x. Rated basic and maximum Current
xi. Meter constant (imp/kWh)

xii.'BIS' Mark
xiii.Class index of meter
xiv."Property of Tata Power Co. Ltd
xv.Purchase Order No. & date
xvi.Guarantee period.
xvii.Sign of double square
xviii.Country of manufacture.
xix.Firmware version of meter
xx.Meter category
xxi.Symbol of load switch.
xxii.NIC serial NO (Shall be visible from Communication Module Slot)
xxiii.Compatibility of NIC Card.

Bidder should ensure that NIC provided in meters are having Sr. No., MFG date, Property of TATA POWER' marked, PO date and no. (same as that of meter PO)

16 Tests:

All routine, acceptance & type tests shall be carried out on the meter and meter body separately in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted in addition to the tests specified in IS/IEC.

16.1 Routine Test

i.AC High Voltage test
ii.Insulation test
iii.Test on limits of error
iv.Test of starting current
v.Test of no load condition

16.2 Acceptance test:

i. AC High Voltage test
ii. Insulation test
iii. Test on limits of error with following loads

120% I max(72A)	I max (60A)	Ib(10A)	0.5 Ib (5A)	0.1Ib (1A)	0.05Ib (0.5A)
UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 Lead and 0.5 lag	UPF

iv. Test of meter constant
v. Test of starting current
vi. Test of no load condition
vii. Test of repeatability of error.
viii. Test of power consumption.
ix. Test for Immunity against external influencing signal as per the Purchaser specification

x. Test for Immunity against DC Immunity as per the Purchaser specification
xi. Test for Immunity against Tamper conditions as per the Purchaser specification
xii. Error measurements with 38 abnormal condition as per annexure I
xiii. Test to Influence of Harmonics
xiv. Supply voltage and frequency variation test
xv. Testing of self diagnostic features
xvi. Tamper count increment and logging with date and time in meter database.
xvii. All tests as defined in IS15959(Part-2): 2016
xviii. Functionality of communication module is 16444 part2
xix. smart meter communicability as per provision of 28 IS 15959 (part-3)
xx. Physical check of NIC and replaceable ease of the NIC module in meter

16.3 Type test:

i. All tests as defined in IS16444 Part 1/IS 15959 Part 2/ IS 13779:1999 with latest edition.
ii. Test against abnormal magnetic influence as per CBIP TR 325 with latest edition.
iii. DC immunity test (injection both on phase and neutral terminal) with latest edition
iv. Test for Material used for Terminal Block and meter body as per relevant standards with latest edition
v. IP test

Note:- Bidder must mention IS 13779:1999 with latest edition in factory test report.

16.4 Special test:

i. The bidder shall demonstrate the communication capability of the meter through communication modes as defined in the specification before conducting acceptance tests. The bidder shall ensure that API (Application protocol interface) is compatible with TPC.
ii. Temperature rise of terminal block with 120% Imax for 6 hours on actual load on sample from first lot

17 Type Tests Certificates:

The bidder shall furnish the type test certificates of the meter for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA as per the relevant standards. 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 TPC.

18 Pre-Dispatch Inspection:

The successful bidder shall submit two prototype samples for further testing and compliance as per specifications and getting approval before mass manufacturing. 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. Bidder shall grant free access to the places of manufacture to TPC's representatives at all times when the work is in progress. Inspection by the TPC or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPC.
Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPC
c) Invoice in duplicate
d) Packing list along with seal and NIC details
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Other Documents (as applicable)
i) Compatible BCS software
j) Meter user manual covering Technical Parameters, display, tamper logics, meter dimensions, etc

19 Inspection after Receipt At Store:

The material received at Purchaser's store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection. The successful bidder shall submit two extra carton boxes (unpaid) per lot delivered (lot size shall be 2,000 numbers or as defined in the order)

20 Guarantee:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a period of at least **60** months from the date of last supplies, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame not more than 1 month, and to the entire satisfaction of Tata Power, failing which Tata Power 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.

Bidder shall own responsibility for all internal component with an end to end agreement with individual component manufacturer.

Bidder to collect all defective meters from stores for repairs as per defined timeframe and send those meters immediately after repairs.
Bidders to submit CAPA report of each defective meter and submit the same to Lab/Store representative along with dispatch of repaired meters.

Meters to be designed in such a way that cases of No display/ Display faulty will be bare minimum or else Tata Power will liable to reject entire lot of meters.

Bidder shall further be responsible for 'free replacement/repairs" of entire lot of meters for any 'Latent Defects '(design issue due to faulty lot component) if noticed and reported by the purchaser within guarantee period.

Manufacture shall collect disputed meter from meter stores and provide testing report of disputed meter refer by TPC within 15 days period irrespective of guarantee period.

21 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.
Packing and transportation shall be as per IS 15707:206 clauses 9.1 and 9.2.
Routine test report of the individual meter shall be kept inside each card board carton of the meter.
The softcopy in PDF format, of the routine test certificate of each meter to be provided by bidder with each lot,

22 Tender Sample

Bidders are required to manufacture 3 sample meters as per the TPC specification (sealed, unsealed and openable base and cover to view/test the inner circuits) and submit the sample (non-returnable) along with bid for approval.

Following accessories to be submitted along with sample

1. Test Reports of 3 sample meters (Type test, Acceptance test **)**
2. Detailed User Manual along with dimension
3. Guaranteed Technical Particulars
4. Tamper logic sheet
5. Display parameter sequence
6. BCS/MRI software for reading, programming and connect/disconnect testing
7. Optical communication cords
8. Internal connection diagram
9. List and make of all electronics component used
10. Clause by clause compliance sheet of Technical Specification
11. Bidder shall be responsible for integration of Meters with NIC and TPC HES.

23 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.

Quality should be ensured at the following stages:

- At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.
- At insertion stage, all components should undergo computerized testing for conforming to design parameter and orientation.
- Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment (ATEs).
- Prior to final testing and calibration, sample meters shall be subjected to aging test (i.e. meters will beare kept in ovens for 24 hours at 55 Deg. C temperature and atmospheric humidity under real-life condition at its full load current. After 24 hours meter should work satisfactorily)

The Purchaser's engineer or its nominated representative shall have free access to the bidder's/manufacturer's works to carry out inspections.

24 Minimum Testing Facilities

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards. The bidder shall have duly calibrated Reference Standard meter of Class 0.05 accuracy or better.

25 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.

26 Spares, Accessories & Tools

Bidder to be provide 2 free of cost 02 nos of JIG for retrieving data from memory of meter with every new design of meter. Jig should be such that NVM can be push fit on jig and data can be retrieve from this NVM

27 Drawings

Following drawings & Documents shall be prepared based on TPC specifications and statutory requirements and shall be submitted with the bid:

a) Completely filLead-in Technical Parameters.
b) General arrangement drawing of the meter
c) Terminal Block dimensional drawing
d) Mounting arrangement drawings.
e) General description of the equipment and all components with makes and technical requirement
f) Type Test Certificates
g) Experience List

h)Manufacturing schedule and test schedule

After the award of the contract, four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval:

S. No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	General Arrangement drawings	√		√
3	Terminal block Dimensional drawings	√		√
4	Mounting arrangement drawing.	√		√
5	Manual/Catalogues		√	
6	Transport/ Shipping dimension drawing		√	√
7	QA &QC Plan	√	√	√
8	Routine, Acceptance and Type Test Certificates	√	√	√

Bidder shall subsequently provide Four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.

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

28 Guaranteed Technical Particulars:

S.No	Description	Units	As Furnished by Bidder
1	Type of meter		
2	Accuracy Class of the meter		
3	Ib & Imax	A	
4	Operating Voltage of Meter and communication unit	V	
5	Operating Frequency	*Hz*	
6	Power Consumption and Burden		
7	Starting Current	mA	
8	Short time over current	A	
9	Influence of heating		

10	Rated impulse withstand voltage	KV	
11	AC withstand Voltage for 1 min	KV	
12	Insulation resistance Between frame &Current, voltage circuits connected together:	M ohm	
13	Mechanical requirement as per IS 13779		
14	Resistance to heat and fire (As per specification)		
15	Degree of protection		
16	Resistance against climatic influence (as per IS 13779)		
17	Electromagnetic Compatibility (EMC)		
18	Accuracy requirements (As per IS 13779		
19	Power factor range		
20	Energy measurement		
21	Connection Diagram for system on terminal cover	Yes/No	
22	Self diagnostic feature		
23	Initial start up of meter (meter shall be fully functional within 5 sec after reference voltage is applied to the meter terminals)		
24	Terminal block a) Depth of the Terminal holes b) Internal diameter of terminal holes c) Clearance between adjacent terminals	 Mm Mm Mm	
25	Communication capabilities as per clause 5.0		
26	Immunity against abnormal Magnetic influence,		
27	Immunity against HV ESD		

28	DC Immunity as defined in		
29	Grade of material for a) Meter base b) Meter cover c) Terminal block d) Terminal cover		
30	Tamper counters		
31	Recording forward energy in all conditions as per annexure I (including current/potential reversal)	Yes/No	
32	Makes of all components used in the meter.	Yes/No	
33	Non Volatile memory (Retention period)		
34	Measuring elements used in the meter		
35	Power supply to circuit in case of supply failure		
36	Display of measured values (As per specification – clause 13)	Energy, Demand, Voltage, current, PF	
37	LCD display (Type and viewing angle)		
38	Pulse rate	Imp/kWh, Imp/kVArh	
39	Name plate marking with laser Printer	Yes/No	
40	Routine test certificates	Yes/No	
41	Acceptance test certificates	Yes/No	
42	Type test certificates	Yes/No	
43	Guarantee certificates	Yes/No	
44	Display Sequence	Yes/No	
45	Tamper thresholds	Yes/No	
46	Ultrasonic Welding of cover and	Yes/No	

	Base		
47	Fire retardant category of meter Body And terminal block		
48	Providing zig for NVM data Retrieval		
49	Meter shall be programed for like RTC, TOD		
50	Dimension of meters L*B*H		
51	KVAH & KVA calculation		
52	Meter data retrieved if meter found no display	Yes/No	
53	RJ 11 Pin configuration as per TPC	Yes/No	
54	Make of Disconnector Switch		
55	Temperature Sensor near terminal block at incomer side		
56	Output Device (LEDs) As per Cl 14		
57	NIC module with cover & sealing arrangement		
58	Measuring element used		
59	Meter Category		
60	Load switch utilization category		

Electronics parts

Sr NO	Component Function	Requirement	Makes and Origin (to be provide by Bidder)
1.	Measurement/ computing chips	The Measurement/ computing chips used in the meter should be with the Surface mount type along with the ASICs	
2.	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	
3.	Display modules	The display modules should be well protected from the external UV radiation . The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The constructior of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial grade with extended temperature range.	
4.	Optical port	Optical port should be used to transfer th meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	
5	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm and Conformal coating required to protect fro Environment like moisture	
6.	Electronic components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes.	
7.	Battery	Lithium with guaranteed life of 15 years	
8.	RTC / Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	
9.	Temperature sensor	Temperature sensor shall be internal to the meter and its accuracy shall be as per relevant IEC / IS standards. The OEM test report to be furnished. With good performance till life of meter.	

29 Schedules Of Deviations:

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(TO BE ENCLOSED WITH THE BID)

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

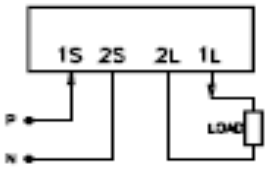
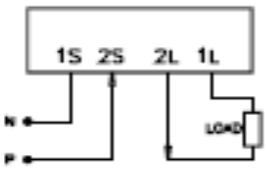
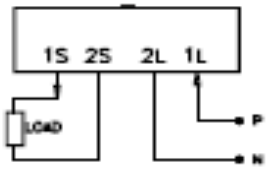
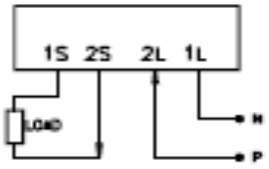
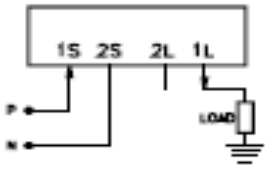
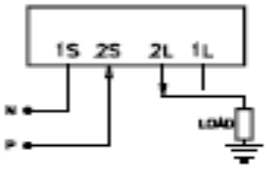
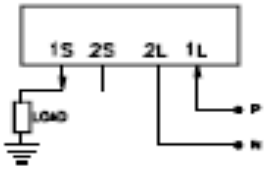
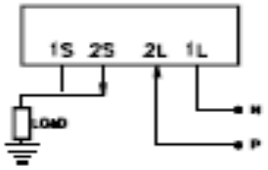
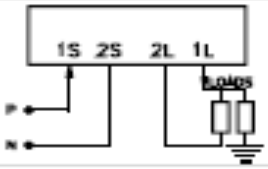
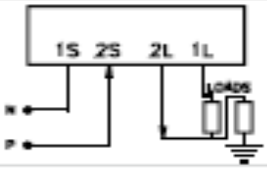
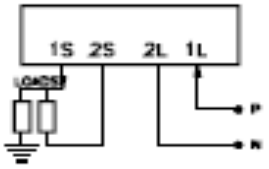
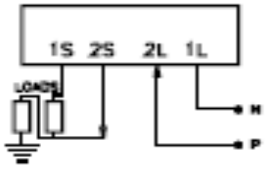
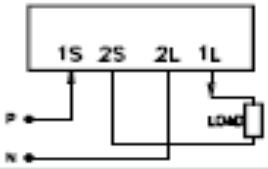
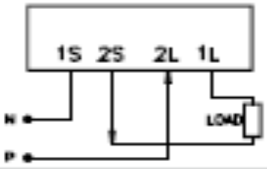
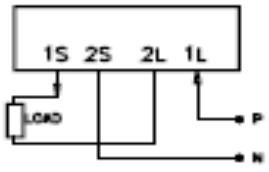
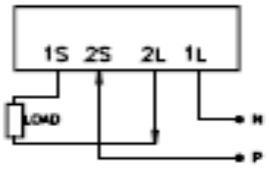
S.No.	Clause No.	Details of deviation with justifications

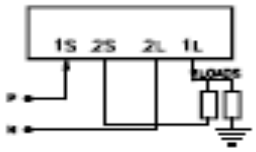
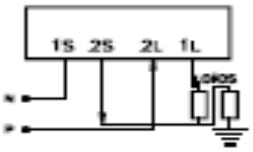
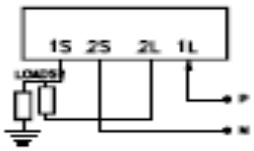
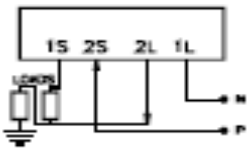
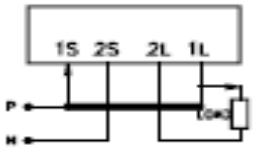
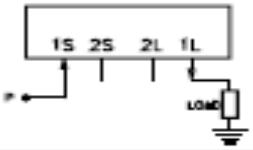
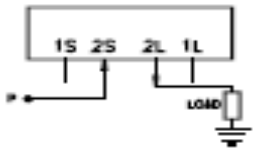
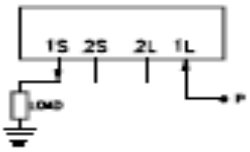
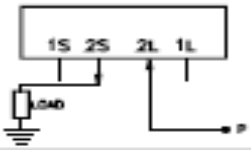
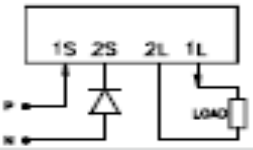
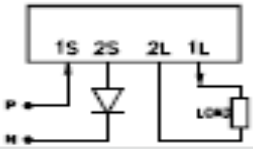
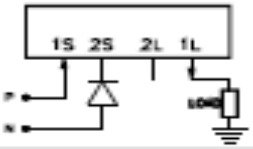
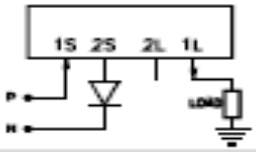
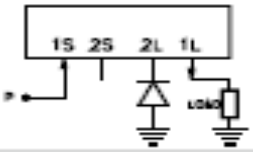
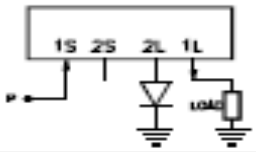
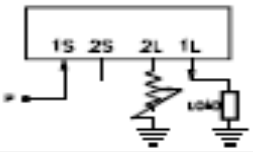
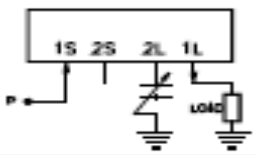
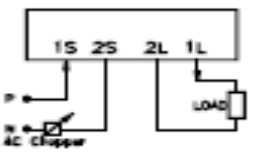
We confirm that there are no deviations apart from those detailed above.

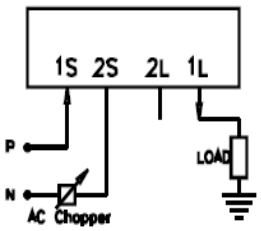
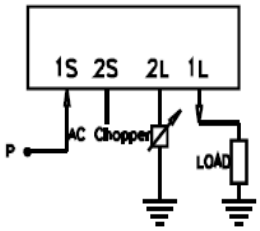
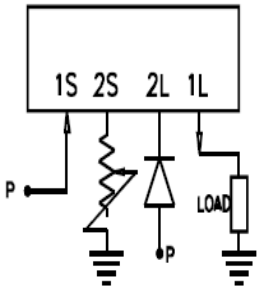
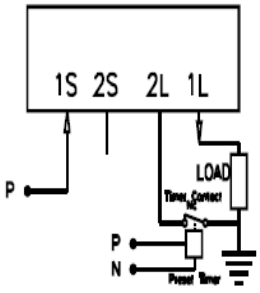
Seal of the Company.

Designation Signature

Annexure :-1

No	Name of Condition	Graphical View	No	Name of Condition	Graphical View
1	Normal condition		2	Phase neutral interchanged at supply side4	
3	Supply-Load interchanged		4	Phase & Neutral interchanged in condition (3)	
5	Full Load Earthed		6	phase-neutral interchanged at supply side in condition (5)	
7	supply load interchanged in condition(5)		8	phase and neural wire interchanged in condition (7)	
9	Partial load earthed		10	phase & Neutral wire interchanged in condition (9)	
11	supply-load interchanging in condition (9)		12	Phase & Neutral wire interchanged in condition (11)	
13	Neutral current reversed		14	Phase & Neutral interchanged in condition 13	
15	supply load interchanging in condition 13		16	Phase-Neutral interchanged in condition 15	

No	Name of Condition	Graphical View	No	Name of Condition	Graphical View
17	Partial load earthed in condition 13		18	Phase-Neutral interchanged in condition 17	
19	Supply-load interchanging in condition 17		20	Phase-Neutral Interchanged in condition 19	
21	Current bypass		22	Neutral Missing	
23	Neutral Missing Phase-at 2S		24	Supply -load interchanged in condition 22	
25	Phase at 2L in condition 24		26	Diode (Reversed) in Neutral	
27	Diode(forward) in Neutral		28	Full load earthed in condition 26	
29	Full load earthed in condition 27		30	Neutral Missing , diode (reversed) at 2L & earthed full load earthed	
31	Diode forward in condition 30		32	Neutral Missing, variable load at 2L & earthed, full load earthed	
33	Neutral Missing, variable capacitance at 2L & earthed, full load earthed		34	chopper in neutral	

No	Name of Condition	Graphical View	No	Name of Condition	Graphical View
35	Load earthed in condition 34		36	Neutral Missing, AC Chopper & earthed, full load earthed	
37	Neutral Missing, earthed load,diode in output and variable resistance with earthing at the input		38	Neutral Missing full load earthed at regular time interval	

TECHNICAL SPECIFICATION

FOR

Three Phase, Four Wire

Class 1, 10-100 Amp,

Smart Whole Current Meter

Tata Power Company Ltd.

Meter management Department

Dharavi Receiving Station,

Matunga,

Mumbai – 400 019

Document No.	TPC\MTL\WC\2019\02	Issue No.	01
		Issue Date	25.09.2019
Revision No.	02	Revision Date	10.06.2022
Description	Prepared By & Date	Reviewed By & Date	Approved By & Date
SPECIFICATION FOR SINGLE PHASE SMART DLMS METER	Himali Patel	Devanjan Dey	S V Savarkar

Revision Summary

Revision No.	Revision Details	Revision Date	Reviewed & Approved By
01	Clause No. 4.31, 4.32, 13.5, 13.8 is modified to include common BCS compatibility, various program feature, load limit profile.	15.10.2020	N Manjunath J S Wadhwa

02	Modified/ Added current rating, DIP(Demand Integration Period) and SIP(Survey Integration Period), Latest IS no., Current rating, Power consumption limit, Change of display sequence through firmware, Additional display sequence for Net meter and LT 2 part, self diagnostics list for LCD segment check, RTC limit, RTC sync, KVAH logic availability in BCS, NIC with 4G LTE with fallback to 2G, Logging of load switch, NIC module design and integration removed from meter specs, Magnetic tamper, ESD tamper, ND tamper, Nomenclature for events, compartment size, smart PT feature optical port with metallic, encapsulated design of meter body, TPC hologram seal to vendor, Meter category in nameplate, pre dispatch inspection, meter guarantee as 60 months, CAPA of defective meter, latent defect.	10.06.2022	Devanjan Dey S V Savarkar

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1 Scope:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site of Three phase four Wire, 3*240 V, 10-100A current operated ac static meters of accuracy class 1.0 (here after referred as meters) complete with all accessories for efficient and trouble free operation. The Meter shall use 4G LTE with fallback provision to 2G for a two way communication with the Head End System (HES)

2 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.

a) IS 16444 Part-1 2015) : A.C. Static Direct connected Watt hour Smart meter class 1.0 and 2.0
b) IS 13779 (2020) :A.C. Static Watt hour meter class 1.0 and 2.0
c) IS 15884 (2010) : A.C. direct connected static prepayment meters for active energy (CL 1 & 2)
d) IS 15959(Part 1-2011) : Data exchange for electricity meter reading, tariff and load control
e) IS 15959(Part 2-2011) : Data exchange for electricity meter reading , tariff and load control
f) IEEE 802.15.4(2003) : Standard for local and metropolitan area networks
g) IS 9000 : Basic Environmental testing procedure for electrical and electronic items.
h) IS 12346 (1999) : Specification for testing equipment for A.C.Electrical energy meter.
i) IS11000 (1984) : Fire hazard testing
j) IEC 62052-11 *(2003)* :Electricity Requirements (AC) General Requirements Tests and Test conditions for A.C.Static Watt hour meter for active energy Class 1.0 and 2.0.
k) IEC 62053-21 (2003) : A.C.Static Watt hour meter for active energy Class 1.0 and 2.0
a. IS 15707 (2006) : Testing Evaluation installation and maintenance of AC Electricity Meters- Code of practice.
l) IEC 60068 : Environmental testing.
m) CBIP – TR No.325 : Specification for A.C. Static Electrical Energy Meters (latest amendment).
n) CEA Regulation (2006) : Installation and operation of meters Dtd: 17/03/2006.
o) IS 60529 : Degree of protection provided by enclosure

3 Climatic Conditions of The Installation:

a) Max. Ambient Temperature : 50 deg.C

b) Max. Daily average ambient temp. : 40 deg.C
c) Min Ambient Temp : 0 deg C
d) Maximum Humidity : 95%
e) Minimum Humidity : 10%
f) Average No. of thunderstorm days per annum : 50
g) Maximum Annual Rainfall : 1450 mm
h) Average No. of rainy days per annum : 60
i) Rainy months : June to Oct.
j) Altitude above MSL not exceeding : 300 meters
k) Wind Pressure : 150 kg/sq m

The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3 g.

4 Technical Requirements:

S.No.	DESCRIPTION	REQUIREMENT
4.1	Type of the meter	Three phase Four wire , whole current meter-direct reading type without application of any multiplication constant. It also Consists of measuring elements, TOU of register, Display load switch and plug in type bi-directional communication module all integral within the meter. The meter design shall be such that no MF required for any parameter
4.2	Accuracy Class of the meter	1.0
4.3	Basic Current (Ib) & rated Maximum current (Imax)	Ib= 10A; Imax= 100 Amps
4.4	Reference Conditions for testing the performance of the meter	Vref = 3 X 240 V ± 1 % Frequency = 50hz ± 0.3% Temperature= 27 C± 2 0C (if the tests are made at the temperature other than reference temperature the results shall be corrected by applying Mean Temperature Coefficient 0.05)
4.5	Operating Voltage	Meter shall be operational with required accuracy from 0.6 Vref to 1.2 Vref. However meter shall withstand the maximum system Voltage of 440V (for minimum 5 min).
4.6	Operating Frequency	50 Hz± 5%.
4.7	Power Consumption	Voltage circuit: Maximum 5.0 W and 15 VA Current Circuit :0.08% of Vref*Imax (The additional power requirement during data transmission shall not exceed 7W per communication module).
4.8	Starting Current	20mA (0.2% of Ib)

4.9	Short time over current	3000 A for 0.01 sec (30Imax for one half cycle at rated frequency)
4.10	Influence of heating	Temperature rise at any point of the external surface of the meter shall not exceed by more than 20K with an ambient temperature at 45^0 C.
4.11	Rated Impulse withstand voltage	6KV (shall be applied ten times with one polarity and then repeated with the other polarity.)
4.12	AC withstand voltage for 1 min	4 KV
4.13	Insulation resistance a) Between frame &current ,voltage circuits connected together:	5 M ohm
4.14	Mechanical requirements	Meter shall be in compliance with clause 12.3 of IS 13779
4.15	Resistance to heat and fire	The terminal block and Meter case shall ensure safety against The spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per IS 13779. Fire retardant material shall be used.
4.16	Protection against penetration of dust and water.	Degree of protection : IP 51 or better as per IS 12063/60529, but without suction in the meter. Meter shall comply with clause 6.9 and 12.5 of IS 13779
4.17	Resistance against Climatic influence.	Meter shall be in compliance with clause 12.6 of IS 13779.
4.18	Electromagnetic Compatibility (EMC)	Meter shall be in compliance with clause 4.5 and 5.5 of IS 15884
4.19	Accuracy requirements	Meter shall be in compliance with clause 11 of IS 13779.
4.20	Power factor range	Zero lag to Zero lead.
4.21	Energy measurement	Fundamental energy +Energy due to Harmonics
4.22	Connection Diagram	The connection diagram for the system shall be provided on terminal cover.
4.23	Self-Diagnostic feature	The meter shall have indications for un satisfactory /non-functioning of (i) Real Time Clock and calendar (ii) RTC battery (iii) Non Volatile Memory (iv) LCD segment check (v) Communication Card
4.24	Initial startup of meter	Meter shall be fully functional within 5 sec after reference Voltage is applied to the meter terminals.
4.25	Alternate mode of supply to the meters	In case of power failure, reading/data shall be to downloaded with the help of battery of long life(minimum ten years) through Optical port in Battery mode.
4.26	Sleep Mode	Meter shall not go in sleep mode .Display should not be "OFF at any point of time when power up.
4.27	Internal diameter of the terminal holes Depth of the terminal holes	9.5mm (minimum) 25 mm
4.28	Clearance between adjacent terminals	10 mm (minimum)
4.29	Display	Backlit LCD, Scrolling, 10 seconds for each parameter minimum 7 Digits LCD display. The back lit must be green in color.

4.30	Security feature	Programmable facility to restrict the access to the information recorded at different security level such as read communication, write communication.
4.31	Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non-smart & upcoming smart meters) can be read through one BCS only.
4.32	Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing & load survey), MD reset, billing date change, relay connect/Disconnect, Set load limit, Pre paid/post paid, Set metering mode (Import/Export), display setting, shall be reconfigure through BCS/CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to TATA power till the useful life of the meters. Change in display setting shall be done through firmware upgrade by means of BCS/CMRI and remotely over the air (OTA). Meter data will not get reset while firmware upgrade. Display sequence for different categories like Net meter and LT2 part is given in the document.
4.33	Usage Application	Indoor and Outdoor
4.34	Ultrasonic welding	Meter cover and body should be Ultrasonic/chemical welded
4.35	Meter Dimension in MM	Is not more than 250L*200W*100H
4.36	Real Time clock	Accuracy of RTC Should be as per CBIP-325 report and shall not vary by ± 7 min per year. Meter RTC shall be corrected automatically by the system in synchronization to the network RTC. Meter shall support RTC sync request from HES also.
4.37	KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity. The same shall be displayed in BCS.
4.38	NO display	Meter Should design such a way, if meter found no display then after meter data retrieved from optical port.
4.39	Communication module of meter for AMI	As per clause no 1.2 (b) of IS 16444. Meter should have provision of communication module compatible with both the variant mentioned in IS 16444 PART-1. The Communication Network Interface Card (NIC) shall be 4G LTE with fallback provision to 2G and support all the bands offered by TSP's in India. It should be plug-in type and field hot swappable with cellular technology NIC of all type of meters of same make. Support for upgrade to 5G should

		be there without replacing the meter. Meter should be able to provide required power supply to NIC card.
4.40	Communication Layer Protocol	Should be as per clause 9.3 of IS 16444
4.41	Key Management and Security Feature	Should be as per IS 15959
4,42	Harmonics recording	The meter should record the current and voltage THD. The meter should record harmonics up to 20th harmonic Average THD of all phase for voltage THD and current THD. THD values shall have 30 minutes integration period in load survey. Accuracy of harmonics recording shall be as per meter accuracy class. The meter shall generate a flag whenever the threshold (user configurable) of the 5% THD of the load current and voltage is breached
4.43	Meter Category	C3 – The same shall be displayed in BCS
4.44	Load switch utilization category	UC2 or better

5 Disconnection Switch

The meter shall have the facility of disconnecting and re-connecting the load of the meter from the remote and by authenticated command through Laptop/HHU at site by means of a built-in switch/relay.

This operation shall be conducted with the help of a third party software which is owned by TATA POWER and in addition to the manufacturer's own software, in Cellular (GPRS/ 3G / 4G / LTE) which can be given through optical port using external modem by utility.

Each operation of the switches shall be logged by the meter as an event with date and time stamp and reading parameters. This operation should be in line with clause 11 of IS 16444 PART-1, however over current tripping should be disabled by default while supply and should have easy enabling provision in feature. Enabling and Disabling configuration setting change By Tata Power whenever required remotely over the air (OTA). The Tata Power will decide the enabling of disconnection based on statuary guidelines and changes in future. The cumulative number of ON/OFF operations shall also be made available in meter data and HES.

Logging of load switch profile shall be made available at BCS//HES end along with date/time stamping & instantaneous parameters like voltage, current, energies (Kwh& KVAH).

The make of the load switch should be of reputed make like Grooner (German) or equivalent and same shall be confirmed by the bidder during tendering. Switch shall

be in compliance to IS 15884. The brief technical particulars of this Disconnector/load switch are furnished below, bidders to comply for the same:-

S.No.	DESCRIPTION	REQUIREMENT
1	Operating Voltage range	130 V to 470 V
2	Operating Current range	20 mA to 120 A
3	Maximum switching power	22 kVA per phase/ per IS 15884 Annex G
4	No. of poles	3 nos (one in each R,Y,B phases)
5	Operation of switches	Simultaneous
6	Utilization Categories	UC2 or better
7	Min. number of operation	3000 (close, open each)

6 Immunity against external influencing signals:

6.1 Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with latest CBIP amendment. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

a) Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate
b) Meter shall show "Magnet" or appropriate icon in the display

Abnormal Magnetic field is defined as below;

a) Continuous DC magnetic induction: >0.2 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.2 Tesla)
b) AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT
c) Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Consumption during magnet temper shall be recorded in defraud register also. Demand shall be recorded as per actual load only.

6.2 Electrostatic Discharge (ESD)

Meter along with NIC shall be immune up to 35 kV and shall record accurate energy as per IS-13779:2020. Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 35 kV and shall show 'ESD' in the display.

The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.

The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.

The meter should be immune or log the tamper on application of any other higher magnetic field of any frequency waves, micro waves.

6.3 Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 1 min and for Pulsating DC and Chopped AC of any value with time delay of 1 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 1 min(occurrences and restoration time).

The meter shall record energy proportional to the current, V Ref (240V) and UPF when any of the tamper circuits enclosed as per annexure are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device and meter should recorded ND in meter memory. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

6.4 Abnormal and Tamper conditions

The meter shall record forward energy under any abnormal conditions.
All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral) , energy, PF).

Meter shall store cumulative count and cumulative durations all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time
Stamp on FIFO basis. The event which is not restored should not be removed from its meter memory and
FIFO should not applicable for unrestored event.
The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not
Operate on vibration or impact during handling or testing.
The meter shall register correctly if supply neutral is not available at the meter neutral terminal. The meter shall work in absence of two incoming wires. It shall keep recording correctly in case of unbalance system voltage.

The meter shall keep working accurately irrespective of the phase sequence of the supply.

The meter shall be able to differentiate between actual CT reversals and condition arising out of unbalanced / unhealthy capacitor bank.
During Voltage Failure event, the meter shall record energy proportional to the current and V Ref (240V).
Meter shall have neutral CT for tamper identification and analysis.
The event compartments shall be IS 15959 Part-1 table 9. The size of compartments should be such that all above event are accommodated in the assigned event compartment. i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table.

All Transactional/Programing related events and Control events for Connect/Disconnect to be logged in BCS/HES along with date/time stamping and instantaneous parameters.
Suitable nomenclature/icon shall be displayed on meter display for Magnet, HV ESD, Neutral Disturbance, Meter cover open related events.

Persistence time for occurrence and restoration for the events and compartment block size shall be as per table given below

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)
1	Voltage Failure	YES	25	Occ: Voltage <192V: and current > 2% Ib. Res: Vph > 191V (Independent of current)	5	5
2	Voltage unbalance	YES	25	Occ : (Vmax-Vph)>10% Vn and Vphase : 191>Vphase< 216 Res : (Vmax-Vph)<10% Vn and Vphase : 191<Vphase> 216	5	5
3	High Voltage	YES	25	Vph > 110% of Vref	30	30
4	CT open	YES	25	Occ: Ir+Iy+Ib+In>10% of Ib(vector Sum) and phase current<10% Ib with all current are positive Res: Ir+Iy+Ib+In<5% of Ib(vector Sum) and phase current>10% Ib with all current are positive	30	30
5	Current unbalance	YES	25	Occ : Imax – Imin > 30% of Iavg Res : Imax – Imin < 30% of Iavg	15	15
6	CT Bypass	YES	25	Occ: Ir+Iy+Ib+In>5% of Ib(vector Sum) and phase current>10% Ib with all current are positive Res: Ir+Iy+Ib+In>2.5% of Ib(vector Sum) and phase current<10% Ib with all current are positive	30	30
7	Current reversal	YES	25	1. Active current negative 2. PF > 0.3	2	2
8	Magnet	NO	25	Whenever meter sense magnetic field it shall record Active and Apparent energy at Imax at UPF	Immediate	Immediate

9	Neutral Disturbance	NO	25	Vph > 150% Vref In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode)	5	5
10	ESD/JAMMER	NO	25	Occ: Immunity upto 50 KV, > 50KV event logged In memory Res: Removal of ESD and Jammer Device	2	2
11	Low PF Tamper	YES	25	OCC: PF < +/- 0.5 and I>1%Ib REC: PF > +/- 0.7 and I>1%Ib	5	5
12	Top Cover open	NO	1	When cover opens by more than 2 to 4 mm.	Immediate	NA
13	Temperature Rise	NO	25	Occ: T > 70˚C REC: T < 60˚C	2	2
14	NIC card Removed (Immediate)	NO	25	OCC: On removal of card RES: On Inserction card	Immediate	Immediate
15	Power On/Off	NO	25	Occ: Actual voltage OFF Res: Actual voltage ON	5	5

Compartment size	
Voltage related events	100
Current related events	100
Power failure related events	30
Transaction related events	20
Other events	50
Non-rollover events	1
Control events for Connect/Disconnect	10

Note:- During Voltage Failure event, The meter shall record energy proportional to the current and V Ref (240V). Smart PT feature can be seen in BCS for verification.

7 General Technical Requirements

The Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against electric shock, safety against effect of excessive temperature, protection against spread of fire, protection against penetration of solid objects, dust and water.

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. Meter shall withstand Solar radiation.

The meters shall be designed and manufactured using SMT (Surface Mount Technology) components.

There should not be any connector or joint in CT secondary connection and shall be soldered directly on PCB.

The battery cell shall be button/coin type leak proof.

All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy as given below or any other equivalent make with the strict approval of Purchaser:

S No	Component Function	Requirement	Makes and Origin
1.	Measurement/ computing chips	The Measurement/ computing chips used in the meter should be with the Surface mount type along with the ASICs	USA: Anolog Devices, Cyrus Logic, Atmel, Phillips South Africa: SAMES Japan: NEC
2.	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel, National Semiconductors, Texas Instruments, Phillips Japan:Hitachi or Oki
3.	Display modules	The display modules should be well protected from the external UV radiations. The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The construction of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial	Taiwan: Holtek Singapore: Bonafied Technologies Korea: Advantek China:Xiamen

		grade with extended temperature range.	
4.	Optical port	Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	USA: National Semiconductors Holland / Korea: Phillips Taiwan: MAXIM Japan:Hitachi
5	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm. and Conformal coating required to protect from Environment like moisture	A class vendor
6.	Electronic components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Phillips, Texas Instruments Japan:Hitachi, Oki, AVX or Ricoh Korea: Samsung
7.	Battery	Lithium with guaranteed life of 15 years	Varta / Tedirun /Sanyo or equivalent.
8.	RTC / Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	USA: Philips , Dallas, Atmel, Motorola Japan: NEC or Oki
9.	Temperature Sensor	Temperature sensor shall be internal to the meter and its accuracy shall be as per relevant IEC / IS standards. The OEM test report to be furnished.With good performance till life of meter.	USA: Philips , Dallas, Atmel, Motorola Japan: NEC or Oki

Note: The makes of the components are in the preferential order.
Vendor shall submit list of components with makes to TPC during sample meter evaluation and FAT.

8 Meter Body:

Meter body shall be made of unbreakable, high grade, fire retardant reinforced Insulating material (protective Class II)with FVo Fire Retardant, self-extinguishing, UV stabilize, recyclable and Anti oxidation properties. The minimum thickness of the meter enclosure shall be 2mm.Meter base shall be opaque with polycarbonate LEXAN 500R or better on prior approval from the Purchaser. Meter cover shall be transparent with polycarbonate LEXAN 143R/943A or equivalent on prior approval from the Purchaser. Meter cover & base shall be provided with continuous and

seamless Ultrasonic/chemical welding such that it is not opened without breaking the enclosure. Front cover & base shall be such that it is not possible to cut & open the meter without certainly damaging the meter body and by no means shall an attempt to reassemble would not leave physical evidence. The damage evidences should be visible externally& should be traceable in such a way that attempts can be proved in court of law. The meter body shall be sealed in such a way that opening of meter base and cover is possible only after breaking the seal(s). Unidirectional screws to be used on meter covers where ever required. However meter with opaque encapsulated design/integrated base and cover (single enclosure) would be highly preferred, thus nullifying the possibility of opening of meter case. The meter body shall be such that the liquid or chemical shall not reach the electronic part PCB, processor and display from meter terminal and push button.
Optical port of meter shall be metallic to hold magnetic optical cord during data downloading locally.

9 Terminals, Terminal Block

Terminal block should be in single mould with meter body base(Not separate). After any attempts the terminal block should not be able to disengaged, opened or loosen from any side. Any attempt to disengage the terminal block should certainly damage the meter body with physical evidences. The damage evidences should be visible externally& should be traceable in such a way that attempts can be proved in court of law.

Terminals may be grouped in terminal block having adequate insulating properties and mechanical strength. In order to satisfy such requirements when choosing insulating materials for the terminal block adequate testing of materials shall be taken into account. Terminal block and terminal cover shall be of a material which complies with the requirements of IS11731 (part 1) method FH1. The material of which the terminal block is made shall be capable of passing the test given in ISO 75 for temperature of 180°C and pressure of 1.8 M Pa. The terminal block shall be of opaque with polycarbonate LEXAN500Ror equivalent on prior approval from the Purchaser.

The terminals shall be marked properly on the terminal block for making external connections.
The terminals and connections shall be suitable to carry up to 120 Amp continuously (Imax 100 A). The size, design & material of terminal so that temperature rise will not be more than 20 ˚C above ambient temperature of 45˚C at 120% of I max loading for 06 hrs continuous.
Temperature sensor to be provided from inside near the terminal block and precisely placed near incoming terminals of the energy meter for sensing the temperature and meter should be programmed in such way that on reaching the threshold value set (as per tamper table) the event/alert should go the to HES/MDMS.

The terminal block, the terminal cover and the meter case shall ensure reasonable safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them.

The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there is no risk of loosening or undue heating. Terminals shall be preferably of MS cage clamp type as per IS: 15707or of flat end screw with at least 9 mm dia of screw for better contact area.
Internal diameter of the terminal holes shall be minimum 9.5 mm; minimum clearance between adjacent terminals shall be 10 mm. Depth of the terminal holes shall be of 25 mm. Terminal screws shall be of Zinc plated MS bottle type.
Meter terminal should have 8pin arrangement consisting of neutral and neutral S2 shorted inside the meter. All terminal should be in one row only.

Terminal block shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material.
The preferred arrangement of terminals shall be linear. Minimum two number of terminal screws to be provided per terminal wire

9.1 Terminal Cover:

Terminal cover shall be of short type and shall be transparent with polycarbonate LEXAN 143R/943A or equivalent on prior approval from the Purchaser. Appropriate space shall be available for incoming /outgoing cables without damaging/stressing terminal cover (terminal cover design shall be as per the Purchaser approval). After sealing the cover, terminals shall not be accessible without breaking the seals.
Terminal Cover with C cut to enable smooth insertion of cable in the terminals.

Length of terminal cover shall not be more than 50 mm length from bottom of terminal block in line with meter base.

The terminal cover should open on the top side, during connection of the cables. The side opening of terminal cover is not acceptable due to additional opening space requirement

9.2 Sealing of meter

Reliable sealing arrangement shall be provided to make the meter tamper evident and to avoid fiddling or tampering by unauthorized persons. For this, one no. Polycarbonate seal left side and one no. Hologram seal on right side shall be provided by the Bidder.
Additional Hologram seals will be provided by TPC to supplier for putting them on meter body as per requirement.
All the seals shall be fixed on meter body by the bidder at his works before dispatch.

Two sealing provision shall be provided at meter terminal cover, such that terminal shall not be accessible without breaking the seals. All the seals shall be provided on front side only and as per the Purchaser specification. Rear side sealing arrangement shall not be accepted. Bidder shall provide seals be as per CEA regulation (2006). Only patented seals to be used as per CEA requirements.

Plug in type NIC card cover should have proper sealing arrangement and should be sealed with manufacturer's polycarbonate seal.
The bidder shall provide the soft record of polycarbonate seal, Manufacturers and TPC hologram seal serial number, NIC card serial number and box packing list used against each meter serial number along with its position in tabular form for every lot of meter.

The manufacture should provide manufacture Hologram seal as and when required by TPC within week.

10 TOD Feature:

The meter shall be capable of measuring Cumulative Energy (KWh), Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by BCS/CMRI/OTA with adequate security level).
TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs
TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

11 MD Integration:

The MD integration period shall be 15 minutes (integration period-programmable by CMRI at site and also thru AMR with adequate security level). The MD resetting shall be automatic at the 1st of the month i.e. 0000 hours of 1st day of the month. Manual MD reset button shall not be available. Last 12 MD values shall be stored in the memory. MD shall be recorded and displayed with minimum three digits before decimal and minimum three digits after decimal points. MD integration shall be Block Type Demand.

12 Parameters In BCS

All these parameters shall be downloaded locally or remotely. All the parameters shall be recorded in its NVM(Non Volatile Memory). NVM shall have minimum retention time of 10 Years. Below mention current, history billing data and at least 25 tamper event for each tamper shall be available In NVM.

12.1 Billing Information

Current+ 12 Month History billing Date
Current + 12 Month History of Energy (KWH, KVAH, KVARH Lag, KVARH Led, Def KWH, Def KVAH)
Current + 12 Month History Consumption (KWH, KVAH, KVARH Lag, KVARH Led, Def KWH, Def KVAH)
Current + 12 Month History of Demand (KW,KVA, KVAR Lag, KVAR led) Along with date and time stamp
Current + 12 Month History of PF
Current + 12 Month History of Disconnected switch cumulative count.

12.2 TOD wise billing Information

Current + 12 Month History of Energy (KWH, KVAH)
Current + 12 Month History of Consumption (KWH, KVAH)
Current + 12 Month History of Demand (KW, KVA) along with date and time stamp
Current + 12 Month History of PF

12.3 Load survey:

The meter shall be capable of recording load profile of atleast 45 days for 15 min IP for ON days only for following parameters.
KWH
KVAH
KVARH Lag
KVARH Led
KW
KVA
KVAR Lag
KVAR Led
AVG PF
Voltage for each Phase
Current for each Phase
Neutral current
Temperature
THD Voltage phase wise
THD Current phase wise

12.4 MID Night Energy:

Meter shall be capable of recording daily Midnight Energy(KWH, KVAH) 00:00 to 24:00 Hrs for 90 power ON days.

12.5 Instantaneous Parameters:

Meter shall have capable following Instantaneous parameter In Memory and should be available in BCS

Meter Serial No
Meter Type
Meter date and Time
MRI date and time
Dump date and time
Voltage of each Phase
Line Current of each Phase
Active Current of each Phase
Reactive Current of each Phase
Actual Neutral current
Power factor of each Phase
Average Power Factor
Instantaneous Frequency
Instantaneous Load (KW, KVA, KVAR Lag, KVAR Led)
Present Cumulative energy(KWH, KVAH, KVARH Lag, KVARH Led, Def KWH, Def KVAH)
Cumulative Tamper count
Cumulative Billing Count
Vector/Phasor diagram
Terminal Block Temperature
No. of disconnected operation Count
Load limit value in KW

12.6 General Information:-

Meter shall be capable for providing below mention general parameters in memory should be available in BCS

Meter serial No
Meter Type
Manufacture Name
Manufacture date
Meter Class
Meter constant
Meter voltage rating
Meter current rating
Firmware version of meter
Available TOD profile showing timing and seasons
Available Meter display sequence

12.7 Transactions:-

All the change in software of meter to be logged along with date and time stamp and instantaneous parameters.

12.8 Load switch profile:-

All energy & demand parameters alongwith date time stamping shall be available with status of Relay connect/disconnect.

13 Display units:

The display unit shall be Pin type built-in liquid crystal display (Permanently backlit type LCD). The LCD shall be of STN (Super Twisted Nematic) construction suitable for maximum temperature withstands 65 C degree and minimum temperature withstands 0degree C during normal operating condition. The LCD display shall have a wide viewing angle of 120 degree. When the meter is not energized the electronic display need not be visible. The display shall not be affected by electrical, magnetic disturbances and ESD. The back lit must be green in color while in normal registration modes.

Display shall have minimum 7 digits before decimal for energy register, 3 digits before & 3 digits after decimal place in the display for demand register, 2 digits before & 5 digits after decimal place in the display for High resolution energy registers, 3 digits before decimal & 3 digit after decimal for Voltage, 3 digits before decimal & 3 digit after decimal for Current, 1 digits before decimal & 3 digit after decimal for PF, 3 digits before decimal & 3 digit after decimal for Power, size of the digits shall be minimum 10mmx6mm. Cumulative energy (KWh) shall be displayed without decimal in auto scroll mode

Persistence time for each parameter shall be 10 second. Values followed by header shall be avoided. (I.e. if MD1 is displayed in Auto scroll mode, Header (MD1) and value (say 5.23 KW) shall be shown simultaneously; it shall not be shown in successive displays. Off time shall not be available in auto scroll mode between each cycle. Auto scroll mode is restored after 30 sec, if push button is not operated.

1. **Default Display sequence –**

Display1 Parameters (Auto Scroll Mode)
Cumulative Forward kWh (7+1)

Display2 Parameters (Manual Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Phase wise Voltage

Instantaneous Phase wise Current
Instantaneous Neutral Current
Instantaneous Active power
Instantaneous Reactive power
Instantaneous Apparent power
Instantaneous Phase wise PF
Cumulative Forward kWh (7+1)
TOD 1 Forward kWh
TOD 2 Forward kWh
TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag
Tariff wise MD Forward kVA Date & time
Cumulative Forward kVArh lead
Cumulative Forward kVAh
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh
Average PF
Latest reset- Forward kWh
Latest reset-TOD 1 Forward kWh
Latest reset-TOD 2 Forward kWh
Latest reset-TOD 3 Forward kWh
Latest reset-TOD 4 Forward kWh
Latest reset-TOD 5 Forward kWh
Latest reset- Forward kVArh lag
Latest reset-Tariff wise MD Forward kVA Date & time
Latest reset- Forward kVArh lead
Latest reset- Forward kVAh
Latest reset-TOD 1 Forward kVAh
Latest reset-TOD 2 Forward kVAh
Latest reset-TOD 3 Forward kVAh
Latest reset-TOD 4 Forward kVAh
Latest reset-TOD 5 Forward kVAh
Latest reset- Average PF
Rising Demand Forwared kVA
Connection Check
Voltage Phase sequence
Current Phase sequence
Previous reset- Forward kWh

Previous reset- Tariff wise Forward kWh
Previous reset - Forward Kvarh Lag
Previous reset- Tariff wise MD forward KVA Date & Time
Previous reset- Forward Kvarh Lead
Previous reset - Forward Kvah
Previous reset - Tariff wise Forward Kvah
Previous reset - Average PF
MD reset count
Defrauded Energy cummulative Kwh
Defrauded Energy cummulative Kvah
Cummulative Tamper count
History of last 3 tampers
Defraud Register Cumulative kWh during Magnetic Tamper (6+2)
Defraud Register Cumulative kWh during ND Tamper (6+2)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest ND tamper occurrence Date & time
Latest ND tamper recovery Date & time
Cover Open tamper occurrence Date & time
Status of Load Switch
Count of Relay connect
Latest Occurrence Relay connect Date & time
Count of Relay disconnect
Latest Occurrence Relay disconnect Date & time
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display3 Parameters (High Resolution Mode)
Cumulative Forward kWh (2+5)
Tariff wise Forward kWh (7+1)
Cumulative Forward kVArh lag (2+5)
Tariff wise Reset Period MD Forward kVA Date & time (3+3)
Cumulative Forward kVArh lead (2+5)
Cumulative Forward kVAh (2+5)
Tariff wise Forward kVAh (7+1)
Battery mode will be as per display 3.

2. Display sequence for LT 2 part (programmable through firmware upgrade) –

Display1 Parameters (Auto Scroll Mode)

Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Cumulative Forward kWh (7+1)
TOD 1 Forward kWh
TOD 2 Forward kWh
TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag
Tariff wise MD Forward kVA Date & time
Cumulative Forward kVArh lead
Cumulative Forward kVAh
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh
Average PF
Latest reset- Forward kWh
Latest reset-TOD 1 Forward kWh
Latest reset-TOD 2 Forward kWh
Latest reset-TOD 3 Forward kWh
Latest reset-TOD 4 Forward kWh
Latest reset-TOD 5 Forward kWh
Latest reset- Forward kVArh lag
Latest reset-Tariff wise MD Forward kVA Date & time
Latest reset- Forward kVArh lead
Latest reset- Forward kVAh
Latest reset-TOD 1 Forward kVAh
Latest reset-TOD 2 Forward kVAh
Latest reset-TOD 3 Forward kVAh
Latest reset-TOD 4 Forward kVAh
Latest reset-TOD 5 Forward kVAh
Latest reset- Average PF

Display2 Parameters (Manual Scroll Mode)

Display Check
Meter Serial Number

RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Phase wise Voltage
Instantaneous Phase wise Current
Instantaneous Neutral Current
Instantaneous Active power
Instantaneous Reactive power
Instantaneous Apparent power
Instantaneous Phase wise PF
Cumulative Forward kWh (7+1)
TOD 1 Forward kWh
TOD 2 Forward kWh
TOD 3 Forward kWh
TOD 4 Forward kWh
TOD 5 Forward kWh
Cumulative Forward kVArh lag
Tariff wise MD Forward kVA Date & time
Cumulative Forward kVArh lead
Cumulative Forward kVAh
TOD 1 Forward kVAh
TOD 2 Forward kVAh
TOD 3 Forward kVAh
TOD 4 Forward kVAh
TOD 5 Forward kVAh
Average PF
Latest reset- Forward kWh
Latest reset-TOD 1 Forward kWh
Latest reset-TOD 2 Forward kWh
Latest reset-TOD 3 Forward kWh
Latest reset-TOD 4 Forward kWh
Latest reset-TOD 5 Forward kWh
Latest reset- Forward kVArh lag
Latest reset-Tariff wise MD Forward kVA Date & time
Latest reset- Forward kVArh lead
Latest reset- Forward kVAh
Latest reset-TOD 1 Forward kVAh
Latest reset-TOD 2 Forward kVAh
Latest reset-TOD 3 Forward kVAh
Latest reset-TOD 4 Forward kVAh
Latest reset-TOD 5 Forward kVAh
Latest reset- Average PF
Rising Demand Forwared kVA
Connection Check

Voltage Phase sequence
Current Phase sequence
Previous reset- Forward kWh
Previous reset- Tariff wise Forward kWh
Previous reset - Forward Kvarh Lag
Previous reset- Tariff wise MD forward KVA Date & Time
Previous reset- Forward Kvarh Lead
Previous reset - Forward Kvah
Previous reset - Tariff wise Forward Kvah
Previous reset - Average PF
MD reset count
Defrauded Energy cummulative Kwh
Defrauded Energy cummulative Kvah
Cummulative Tamper count
History of last 3 tampers
Defraud Register Cumulative kWh during Magnetic Tamper (6+2)
Defraud Register Cumulative kWh during ND Tamper (6+2)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest ND tamper occurrence Date & time
Latest ND tamper recovery Date & time
Cover Open tamper occurrence Date & time
Status of Load Switch
Count of Relay connect
Latest Occurrence Relay connect Date & time
Count of Relay disconnect
Latest Occurrence Relay disconnect Date & time
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display3 Parameters (High Resolution Mode)
Cumulative Forward kWh (2+5)
Cumulative Forward kVArh lag (2+5)
Cumulative Forward kVArh lead (2+5)
Cumulative Forward kVAh (2+5)
Battery mode will be as per display 3.

3. Display sequence for Net meter (programmable through firmware upgrade) –

Display1 Parameters (Auto Scroll Mode)

Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Cumulative kWh (7+1) - Import
TOD 1 kWh - Import
TOD 2 kWh - Import
TOD 3 kWh - Import
TOD 4 kWh - Import
TOD 5 kWh - Import
Cumulative kVArh lag - Import
Tariff wise MD kVA Date & time - Import
Cumulative kVArh lead - Import
Cumulative kVAh - Import
TOD 1 kVAh - Import
TOD 2 kVAh - Import
TOD 3 kVAh - Import
TOD 4 kVAh - Import
TOD 5 kVAh - Import
Cumulative kWh (7+1) - Export
TOD 1 kWh - Export
TOD 2 kWh - Export
TOD 3 kWh - Export
TOD 4 kWh - Export
TOD 5 kWh - Export
Cumulative kVArh lag - Export
Tariff wise MD kVA Date & time - Export
Cumulative kVArh lead - Export
Cumulative kVAh - Export
TOD 1 kVAh - Export
TOD 2 kVAh - Export
TOD 3 kVAh - Export
TOD 4 kVAh - Export
TOD 5 kVAh - Export
Average PF
KVA Rising demand

Display2 Parameters (Manual Scroll Mode)

Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)

Instantaneous Phase wise Voltage
Instantaneous Phase wise Current
Instantaneous Neutral Current
Instantaneous Active power
Instantaneous Reactive power
Instantaneous Apparent power
Instantaneous Phase wise PF
Net Average PF
Rising Demand Forwared kVA
Latest reset- Cumulative kWh (7+1) - Import
Latest reset- TOD 1 kWh - Import
Latest reset- TOD 2 kWh - Import
Latest reset- TOD 3 kWh - Import
Latest reset- TOD 4 kWh - Import
Latest reset- TOD 5 kWh - Import
Latest reset- Cumulative kVArh lag - Import
Latest reset- Tariff wise MD kVA Date & time - Import
Latest reset- Cumulative kVArh lead - Import
Latest reset- Cumulative kVAh - Import
Latest reset- TOD 1 kVAh - Import
Latest reset- TOD 2 kVAh - Import
Latest reset- TOD 3 kVAh - Import
Latest reset- TOD 4 kVAh - Import
Latest reset- TOD 5 kVAh - Import
Latest reset- Cumulative kWh (7+1) - Export
Latest reset- TOD 1 kWh - Export
Latest reset- TOD 2 kWh - Export
Latest reset- TOD 3 kWh - Export
Latest reset- TOD 4 kWh - Export
Latest reset- TOD 5 kWh - Export
Latest reset- Cumulative kVArh lag - Export
Latest reset- Tariff wise MD kVA Date & time - Export
Latest reset- Cumulative kVArh lead - Export
Latest reset- Cumulative kVAh - Export
Latest reset- TOD 1 kVAh - Export
Latest reset- TOD 2 kVAh - Export
Latest reset- TOD 3 kVAh - Export
Latest reset- TOD 4 kVAh - Export
Latest reset- TOD 5 kVAh - Export
Latest reset Average PF
Previous reset- Cumulative kWh (7+1) - Import
Previous reset- TOD 1 kWh - Import
Previous reset- TOD 2 kWh - Import

Previous reset- TOD 3 kWh - Import
Previous reset- TOD 4 kWh - Import
Previous reset- TOD 5 kWh - Import
Previous reset- Cumulative kVArh lag - Import
Previous reset- Tariff wise MD kVA Date & time - Import
Previous reset- Cumulative kVArh lead - Import
Previous reset- Cumulative kVAh - Import
Previous reset- TOD 1 kVAh - Import
Previous reset- TOD 2 kVAh - Import
Previous reset- TOD 3 kVAh - Import
Previous reset- TOD 4 kVAh - Import
Previous reset- TOD 5 kVAh - Import
Previous reset- Cumulative kWh (7+1) - Export
Previous reset- TOD 1 kWh - Export
Previous reset- TOD 2 kWh - Export
Previous reset- TOD 3 kWh - Export
Previous reset- TOD 4 kWh - Export
Previous reset- TOD 5 kWh - Export
Previous reset- Cumulative kVArh lag - Export
Previous reset- Tariff wise MD kVA Date & time - Export
Previous reset- Cumulative kVArh lead - Export
Previous reset- Cumulative kVAh - Export
Previous reset- TOD 1 kVAh - Export
Previous reset- TOD 2 kVAh - Export
Previous reset- TOD 3 kVAh - Export
Previous reset- TOD 4 kVAh - Export
Previous reset- TOD 5 kVAh - Export
Previous reset Average PF
Connection Check
Voltage Phase sequence
Current Phase sequence
MD reset count
Defrauded Energy cummulative Kwh
Defrauded Energy cummulative Kvah
Cummulative Tamper count
History of last 3 tampers
Defraud Register Cumulative kWh during Magnetic Tamper (6+2)
Defraud Register Cumulative kWh during ND Tamper (6+2)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest ND tamper occurrence Date & time
Latest ND tamper recovery Date & time
Cover Open tamper occurrence Date & time

Status of Load Switch
Count of Relay connect
Latest Occurrence Relay connect Date & time
Count of Relay disconnect
Latest Occurrence Relay disconnect Date & time
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display3 Parameters (High Resiolution Mode)
Cumulative Forward kWh (2+5) - Import
Cumulative Forward kVArh lag (2+5) - Import
Cumulative Forward kVArh lead (2+5) - Import
Cumulative Forward kVAh (2+5) - Import
Cumulative Forward kWh (2+5) - Export
Cumulative Forward kVArh lag (2+5) - Export
Cumulative Forward kVArh lead (2+5) - Export
Cumulative Forward kVAh (2+5) - Export
Battery mode will be as per display 3.

For Net meter mode, Both Import and export energy recording shall be applicable in this mode of metering and relevant registers like Billing, LS, tamper logics etc shall be updated and shall be available in BCS also

Note: Latest reset is History 1 & Previous reset is History 2

All these parameters shall be downloaded locally or remotely and interpreted in PC/Laptop.

All the parameters shall be recorded and memorized in its Non-Volatile Memory (NVM). The corresponding non-volatile memory shall have a minimum retention time of 10 years.

14 Output Device:

14.1 Pulse rate

The meters shall have a suitable test output device. Red color blinking LED (marked as imp/kWh) shall be provided in the front. This device shall be suitable for using with sensing probe used with test benches or reference standard meters. The test output device shall have constant pulse rate of Imp / kWh and Imp/Kvarh. Meter constant shall be indelibly printed on the name plate as imp/kwh and Imp/Kvarh

Meter constant shall be as actual without multiplying factor.

14.2 Communication LCD indicator

The meter shall be provided with suitable LCD indication for communication in progress.

Meter shall display Communication status indications on LCD without affecting normal display parameters.

14.3 Load Switch LED indicator

The meter shall be provided with suitable LED indication for condition of load switch (Close/open). LCD should show when load switch is open.

15 Name plate and Marking:

Meters shall have a name plate clearly visible and effectively secured against removal. The name plate data should be laser printed. No sticker to be used to avoid loss of data in event of fire. The base color of Name plate shall be white indelibly and distinctly marked with all essential particulars as per relevant standards along with the following. The Serial no. series applicable for the meters shall be provided by Tata Power.

i. Manufacturer's name
ii. Type designation
iii. Number of phases and wires
iv. Serial number (Meter serial number shall be laser printed on name plate instead on sticker).
v. Serial number along with barcode
vi. Month and Year of manufacture
vii. Unit of measurement
viii. Reference voltage ,frequency
ix. Ref. temperature
x. Rated basic and maximum Current
xi. Meter constant (imp/kWh)
xii. 'BIS' Mark
xiii. Class index of meter
xiv. Property of Tata Power Co. Ltd
xv. Purchase Order No. & date
xvi. Guarantee period.
xvii. Sign of double square
xviii. Country of manufacture.
xix. Firmware version of meter
xx. Meter category
xxi. Symbol of load switch.
xxii. NIC serial NO (Shall be visible from Communication Module Slot)
xxiii. Compatibility of NIC Card.

Bidder should ensure that NIC provided in meters are having Sr. No., MFG date, Property of TATA POWER' marked, PO date and no. (same as that of meter PO)

16 Tests:

All routine, acceptance & type tests shall be carried out on the meter and meter body separately in accordance with the relevant IS/IEC. All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted in addition to the tests specified in IS/IEC.

16.1 Routine Test

i. AC High Voltage test
ii. Insulation test
iii. Test on limits of error
iv. Test of starting current
v. Test of no load condition

16.2 Acceptance test:

i. AC High Voltage test
ii. Insulation test
iii. Test on limits of error with following loads

120% I max	I max	Ib	0.5 Ib	0.1 Ib	0.05Ib
UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 lead and 0.5 lag	UPF, 0.8 Lead and 0.5 lag	UPF

iv. Test of meter constant
v. Test of starting current
vi. Test of no load condition
vii. Test of repeatability of error.
viii. Test of power consumption.
ix. Test for Immunity against external influencing signal as per the Purchaser specification
x. Test for Immunity against DC Immunity as per the Purchaser specification
xi. Test for Immunity against Tamper conditions as per the Purchaser specification
xii. Error measurements with abnormal condition
xiii. Test to Influence of Harmonics
xiv. Supply voltage and frequency variation test
xv. Testing of self-diagnostic features.
xvi. All tamper test, count increment and logging with date and time in meter database.
xvii. All tests defined in IS 15959(part-2):2016
xviii. Functionality of communication module is 16444 part2
xix. smart meter communicability as per provision of 28 IS 15959 (part-3)
xx. Physical check of NIC and replaceable ease of the NIC module in meter

16.3 Type test:

i. All tests as defined in IS16444 Part 1/IS 15959 Part 2/ IS 13779:2020 with latest edition.
ii. Test against abnormal magnetic influence as per CBIP TR 325 with Latest editions.
iii. DC immunity test (injection both on phase and neutral terminal)
iv. Test for Material used for Terminal Block and meter body as per relevant standards with Latest editions.
v. IP Test with Latest editions.

Note:- Bidder must mention IS 13779:2020 with latest edition in factory test report.

16.4 Special test:

i. The bidder shall demonstrate the communication capability of the meter through communication modes as defined in the specification before conducting acceptance tests. The bidder shall ensure that API (Application protocol interface) is compatible with TPC.
ii. Temperature rise of terminal block with 120% Imax for 6 hours on actual load on sample from first lot.

17 Type Tests Certificates:

The bidder shall furnish the type test certificates of the meter for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI / ERDA as per the relevant standards. 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 TPC.

18 Pre-Dispatch Inspection:

The successful bidder shall submit two prototype samples for further testing and compliance as per specifications and getting approval before mass manufacturing. 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. Bidder shall grant free access to the places of manufacture to TPC's representatives at all times when the work is in progress. Inspection by the TPC or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPC.

Following documents shall be sent along with material

a) Test reports
b) MDCC issued by TPC
c) Invoice in duplicate
d) Packing list
e) Drawings & catalogue
f) Guarantee / Warrantee card
g) Delivery Challan
h) Other Documents (as applicable)
i) Compatible BCS software
j) Meter user manual covering Technical Parameters, display, tamper logics, meter dimensions, etc

19 Inspection After Receipt At Store:

The material received at Purchaser's store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection. The successful bidder shall submit two extra carton boxes (unpaid) per lot delivered (lot size shall be 2,000 numbers or as defined in the order)

20 Guarantee:

Bidder shall stand guarantee towards design, materials, workmanship & quality of process / manufacturing of items under this contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the purchaser up to a period of at least **60** months from the date of last supplies, Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame not more than 1 month, and to the entire satisfaction of Tata Power, failing which Tata Power 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.

Bidder shall own responsibility for all internal component with an end to end agreement with individual component manufacturer.

Bidder to collect all defective meters from stores for repairs as per defined timeframe and send those meters immediately after repairs.
Bidders to submit CAPA report of each defective meter and submit the same to Lab/Store representative along with dispatch of repaired meters.
Meters to be designed in such a way that cases of No display/ Display faulty will be bare minimum or else Tata Power will liable to reject entire lot of meters.

Bidder shall further be responsible for 'free replacement/repairs" of entire lot of meters for any 'Latent Defects '(design issue due to faulty lot component) if noticed and reported by the purchaser within guarantee period.

Manufacture shall collect disputed meter from meter stores and provide testing report of disputed meter refer by TPC within 15 days period irrespective of guarantee period.

21 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.

Packing and transportation shall be as per IS 15707:206 clauses 9.1 and 9.2.
Routine test report of the individual meter shall be kept inside each card board carton of the meter.
The softcopy in PDF format, of the routine test certificate of each meter to be provided by bidder with each lot.

22 Tender Sample:

Bidders are required to manufacture 3 sample meters as per the TPC specification (sealed, unsealed and openable base and cover to view/test the inner circuits) and submit the sample (non-returnable) along with bid for approval.

Following accessories to be submitted along with sample

1. Test Reports of 3 sample meters (Type test, Acceptance test **)**
2. Detailed User Manual along with dimension
3. Guaranteed Technical Particulars
4. Tamper logic sheet
5. Display parameter sequence
6. BCS/MRI software for reading, programming and connect/disconnect testing
7. Optical communication cords
8. Internal connection diagram
9. List and make of all electronics component used
10. Clause by clause compliance sheet of Technical Specification
11. Bidder shall be responsible for integration of Meters with NIC and TPC HES.

23 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.

Quality should be ensured at the following stages:
At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.
At insertion stage, all components should undergo computerized testing for conforming to design parameter and orientation.
Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment (ATEs).
Prior to final testing and calibration, sample meters shall be subjected to aging test (i.e. meters will beare kept in ovens for 24 hours at 55 Deg. C temperature and atmospheric humidity under real-life condition at its full load current. After 24 hours meter should work satisfactorily)

The Purchaser's engineer or its nominated representative shall have free access to the bidder's/manufacturer's works to carry out inspections.

24 Minimum Testing Facilities:

Bidder shall have adequate in house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards. The bidder shall have duly calibrated Reference Standard meter of Class 0.05 accuracy or better.

25 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.

26 Spares, Accessories & Tools:

Bidder to be provide 2 free of cost 02 nos of JIG for retrieving data from memory of meter with every new design of meter. Jig should be such that NVM can be push fit on jig and data can be retrieve from this NVM

27 Drawings:

Following drawings & Documents shall be prepared based on TPC specifications and statutory requirements and shall be submitted with the bid:

a) Completely filled-in Technical Parameters.
b) General arrangement drawing of the meter
c) Terminal Block dimensional drawing
d) Mounting arrangement drawings.
e) General description of the equipment and all components with makes and technical requirement
f) Type Test Certificates
g) Experience List
h) Manufacturing schedule and test schedule

After the award of the contract, four (4) copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval:

S. No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	√		√
2	General Arrangement drawings	√		√
3	Terminal block Dimensional drawings	√		√
4	Mounting arrangement drawing.	√		√
5	Manual/Catalogues		√	

6	Transport/ Shipping dimension drawing		√	√
7	QA &QC Plan	√	√	√
8	Routine, Acceptance and Type Test Certificates	√	√	√

Bidder shall subsequently provide Four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy (Compact Disk CD) of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.
All the documents & drawings shall be in English language.
Instruction Manuals: Bidder shall furnish two softcopies (CD) and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

28 Guaranteed Technical Particulars:

S.No	Description	Units	As Furnished by Bidder
1	Type of meter		
2	Accuracy Class of the meter		
3	Ib & Imax	A	
4	Operating Voltage of Meter and communication unit	V	
5	Operating Frequency	*Hz*	
6	Power Consumption and Burden		
7	Starting Current	mA	
8	Short time over current	A	
9	Influence of heating		
10	Rated impulse withstand voltage	KV	
11	AC withstand Voltage for 1 min	KV	
12	Insulation resistance a) Between frame &Current, voltage circuits connected together:	M ohm	
13	Mechanical requirement as per IS 13779		
14	Resistance to heat and fire (As per specification)		
15	Degree of protection		

16	Resistance against climatic influence (as per IS 13779)		
17	Electromagnetic Compatibility (EMC)		
18	Accuracy requirements (As per IS 13779(latest Editions)		
19	Power factor range		
20	Energy measurement		
21	Connection Diagram for system on terminal cover	Yes/No	
22	Self diagnostic feature		
23	Initial start up of meter (meter shall be fully functional within 5 sec after reference voltage is applied to the meter terminals)		
24	Terminal block a) Depth of the Terminal holes b) Internal diameter of terminal holes c) Clearance between adjacent terminals	 mm mm mm	
25	Communication capabilities as per clause 5.0		
26	Immunity against abnormal Magnetic influence, as defined in Cl. 6.0.1		
27	Immunity against HV ESD as defined in Cl. 6.0.2		
28	DC Immunity as defined in Cl. 6.0.3		
29	Grade of material for a) Meter base b) Meter cover c) Terminal block d) Terminal cover		
30	Tamper counts		

31	Recording forward energy in all conditions.	Yes/No	
32	Makes of all components used in the meter.	Yes/No	
33	Non Volatile memory (Retention period)		
34	Measuring elements used in the meter		
35	Power supply to circuit in case of supply failure		
36	Display of measured values (As per specification – clause 13)	Yes/No	
37	LCD display (Type and viewing angle)		
38	Pulse rate	Imp/kWh, Imp/kVArh	
39	Name plate marking	Yes/No	
40	Routine test certificates	Yes/No	
41	Acceptance test certificates	Yes/No	
42	Type test certificates	Yes/No	
43	Guarantee certificates	Yes/No	
44	Display Sequence	Yes/No	
45	Tamper thresholds	Yes/No	
46	Ultrasonic Welding of cover and Base	Yes/No	
47	Fire retardant category of meter Body And terminal block		
48	Supply of jig for retrieval of Damaged/ burnt meter.		
49	Meter shall be programed for like RTC, TOD		
50	Dimension of meters L*B*H		
51	KVAH & KVA calculation		

52	Meter data retrieved if meter found no display	Yes/No	
53	RJ 11 Pin configuration as per TPC	Yes/No	
54	Make of Disconnector Switch		
55	Temperature Sensor near terminal block at incomer side		
56	Output Device (LEDs) As per Cl 14		
57	NIC module with cover & sealing Arrangement		
58	Harmonics Recording- The recording of harmonics up to 20th harmonic Average THD of all phase for voltage THD and current THD.		
59	Accuracy of harmonics recording		
60	Measuring element used		
61	Meter Category		
62	Load switch utilization category		

Electronics parts

Sr NO	Component Function	Requirement	Makes and Origin (to be provide by Bidder)
1.	Measurement/ computing chips	The Measurement/ computing chips used in the meter should be with the Surface mount type along with the ASICs	
2.	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	
3.	Display modules	The display modules should be well protected from the external UV radiations The display visibility should be sufficient to read the meter mounted between height of 0.5m and 2m. The construction of the modules should be such that the displayed quantity should not disturbed with the life of display. (Pin Type) It should be trans-reflective STN type industrial grade with extended temperature range.	
4.	Optical port	Optical port should be used to transfer the meter data to meter reading instrument. The mechanical construction of the port should be such to facilitate the data transfer easily.	
5	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm and Conformal coating required to protect from Environment like moisture	
6.	Electronic Components	The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes.	
7.	Battery	Lithium with guaranteed life of 15 years	
8.	RTC / Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	
9.	Temperature sensor	Temperature sensor shall be internal to the meter and its accuracy shall be as per relevant IEC / IS standards. The OEM test report to be furnished. With good performance till life of meter.	

29 Schedules Of Deviations:

The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless **specifically** mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications.

(TO BE ENCLOSED WITH THE BID)

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

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

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

Seal of the Company.

Designation Signature

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1 Smart Meter Project at Tata Power Mumbai

1.1 Background

Tata Power - Distribution is engaged in retail supply of electricity across Mumbai Licensed area. The total spread of the licensed area is 485 Sq. Km. covering the main city of Mumbai & its suburbs and houses a population of approximately 1.45 crores. Presently Tata Power has a consumer base of about 7 Lac which includes HT & LT Industrial, Commercial and Residential consumers. This RFP is being floated for inviting tender for Supply and Integration of Smart Meters with Head End System and Meter Data Management system for the consumers of Tata Power. The supply under the RFP would cover 15,000 Smart Meters which would include Single Phase, Three Phase Whole current Smart Meters.

1.2 Brief Scope of Work

1.2.1 Bidder shall study the existing system of Tata Power and offer Smart Metering solution and design and integration of Smart Meters of different type, integrate with existing TPC HES, carry out the integration of their Head-End System with Meter Data Management System of Tata Power.

1.2.2 Bidder shall Design, Supply and Integrate the Smart Meter with 4G fall back 2G Network Interface Card (NIC).

1.2.3 Bidder shall extend desired support (without any extra cost) to integrate these Smart Meter with Tata Power HES.

1.2.4 Bidder shall demonstrate the integration of meter with Tata Power existing HES and Smart Meter functioning as per IS standards as part of technical evaluation if asked by TPC.

- **1.3 The Project Quantity**

The Project is intended for supply and integration of Smart Meters as per below list.

Sr. No	Particulars	Quantity
1	1PH Whole Current Smart Meter	10000
2	3PH Whole Current Smart Meter	5000

- The exact order quantity will be decided at the time of ordering.
- Tata Power may split the order quantity to more than 1 bidders.
- Tata Power may place the OLA for taking the meters in batch as per requirement.

2 Smart Meters

2.1.1 Smart meters will have to be supplied as per the specifications of Tata Power Mumbai.

2.1.2 Following types of Smart Meters are to be supplied

- Single & Three Phase Whole current Smart Meters

2.1.3 Smart Meter shall have the following minimum basic features (but not limited to)

- Plug-in Type Bidirectional Communication module / Network Interface Card (NIC) with suitable sealing arrangement.
- The Plug-in module shall be field Hot Swappable with any type of communication module such as 4G(LTE) fallback to 2G. Smart Meter shall have the dedicated slot with suitable power arrangement which will accommodate any type of Communication Module/ Network Interface Card without the need to replace entire meter. (The bidder shall be able to demonstrate this feature i.e. Same Meter can work on multiple technology NIC)
- 4G NIC shall have facility of auto fall back to 2G networks.
- Integrated Load Limiting Switch / Relay
- Pre-Paid Functionality.
- Net Metering Feature (Import/Export Energy Measurements)
- Tamper event detection, recording and reporting
- Terminal Cover Open with “time stamp” registration at no power
- Power event alarms such as Loss of Supply, Low/ High Voltage, Phase Unbalance
- Remote Firmware Upgrade
- On Demand Reading

2.1.4 The Bidder shall have the ability to incorporate various communication technologies, such as : GPRS/2G/3G/4G /5G LTE/NBIoT all in the same module form factor.

2.1.5 Bidder shall provide all the support for Up-gradation / Modification of Firmware.

2.1.6 The bidder shall ensure the possibility of up-gradation of the Firmware / software in the communication modules/Smart Meter from remote.

2.1.7 Offered solution to comply with the existing IS standards for applications as mentioned in RFP & its Feasibility to change / modify the offered solution based on changes happening in standards in future.

2.1.8 Offered solution to comply with all govt notifications in force as on date of order placement. Bidder should also support in complying the latest govt notifications issued time to time within speculated timelines provided by govt.

2.1.9 Smart Meter should display signal strength/ network type/ communication status on display for quick analysis and shall have the facility to send the same to HES.

2.1.10 Bidder should supply the Smart Meter as per the Tata Power Data Model. Bidder should support with firmware changes and obis code development to meet the requirement of Tata Power. Any firmware change required due to regulatory or statutory body requirement will be done by bidder on priority basis to meet the timeline throughout the life cycle of meter.

3 Communication System

3.1 General requirement for communication system

3.1.1 Tata Power intends to leverage 4G (LTE) as the primary communication technology with hot swappable Network Interface Card. NIC Card should support fallback to 2G option. Tata Power require the NIC Cards to be supplied with e-SIM. Bidder is required to demonstrate the facility as a part of tender evaluation.

3.1.2 Bidder shall ensure integration of the meters with the Tata Power provided NSP.

3.1.3 Bidder shall ensure the integration of meters with Tata Power HES system.

3.1.4 Tata Power will execute separate agreement with NSP.

3.1.5 The Network Interface Card (NIC) for 4G shall be modular and pluggable.

3.1.6 Meter supplied by bidder and network elements of the proposed solution comply to the WPC/any other Govt. regulatory and security guidelines. The offered solution should have minimum life cycle cost and should perform as per the defined SLA.

3.2 Functional requirements of Network Interface Card (NIC)

3.2.1 NIC shall be interoperable at smart meter level of multiple make and model. Also the NIC shall be vendor and service provider agnostic.

3.2.2 Bidder to supply suitable communication system as described above to ensure appropriate primary and fall-back arrangement for data flow from Smart meter till the HES.

3.2.3 NIC shall support two-way communications between smart meter & head-end system such as data exchange, configuration parameters exchange, alarms, operational commands, firmware upgrade of the meter as defined in IS16444 and IS15959 (With latest amendments).

3.2.4 NIC shall support push services, alarms services of the smart meter as defined in IS16444 and IS15959 (With latest amendments).

3.2.5 NIC shall also support on-demand / schedule reading, connect / disconnect, time sync, configuration and over the air firmware upgrade from the head-end system.

3.2.6 NIC card shall support remote Device Management Capability such as Reset, Configuration, Log Check, Ping, and over the air Firmware upgrade

3.2.7 NIC shall have persistent network connectivity throughout as defined by 4G standards. It shall support pre-configuring and self-healing features.

3.2.8 NIC shall operate 24*7 and shall recover from any deadlock situation in the field immediately.

3.2.9 NIC shall register with network i.e. login and logout of each terminal to the HES. It shall be recognized in the HES as authorized node.

3.2.10 Attributes such as Firmware version, Hardware version, Signal strength values, packet error rate, should be pushed periodically to HES for effective communication management.

3.2.11 NIC shall support standard security protocols.

3.2.12 NIC shall be compliant with cyber security norms.

3.2.13 Data must be encrypted with AES-128 bit or current IS standard or higher level.

3.2.14 Support for provision of a unique certificate/key in each card for mutual authentication with the HES from security point of view.

3.2.15 LED indication for System, Power ON indicator.

3.2.16 Colour coded LED (a) For latching on to the network (b) For latched on to the network (c) For data flow indication.

3.2.17 Meter should support configuration of APN, Push IP, Load limit & current limit (enable-diable, threshold settings, timing settings etc) , configuration change(prepaid configs, TOD configs., load survey, demand period time, MD reset, RTC etc.) from remote and local. Bidder to also provide local application for the same.

3.2.18 Supplied NIC should support all the operational cellular bands of all Telecom Service Providers operating in Country on the date of award of PO.

3.2.19 Supplied Smart Meter along with NIC card should be ready to handle the future advancement of communication technology like 5G. It should be possible through NIC change/firmware update/ configuration change without replacing meters.

3.2.19 Appropriate software/ tools with life time license to be provided for internal troubleshooting of NIC & Device Level Issues. Training of same to be given to Tata Power personal without any cost implications.

3.3 SIM CARD MANAGEMENT

3.3.1 SIM cards shall be provided to the Bidder by Tata Power.

3.3.2 SIM Cards will be dispatched to the bidder address by NSP as per project plan given by bidder. Bidder shall supply the meters after installing the sim cards & sealing the meters from their factory.

3.3.3 Bidder shall do the configuration like APN setting and push IP assignment at their factory as per details given by Tata Power.

3.3.4 Bidder shall provide the reconciliation of supplied sim cards and provide the meter, sim nic mapping details as per Tata Power format before meter dispatch in all batches.

3.3.5 NIC card with E-SIM Facility would be required. Supplied e-sim module should support all network service providers in India.

3.3.6 TPC can also ask for the supply of some of the modules with Nb-IOT modules. Quantity can be mutually discusued.

4 Facility Management Services (FMS)

1. Bidder shall provide Facility Management Services (FMS) for the Smart Meter Project (Consumer and DT Meter).
2. FMS for particular meter shall start from the date of successful data transfer through remote and completion of one billing cycle.
3. Under FMS, the Bidder shall provide maintenance support for the Meter and NIC with the goal of meeting the SLA.
4. Bidder to submit it's after sale service support plan and escalation matrix in order to meet contractual obligations and performance guidelines. Bidder should have service office in Tata Power Area, once PO is awarded. The bidder should have sufficient technical person on roll of the company having relevant experience.
5. Bidder shall ensure 100% availability of monthly billing meter data for Smart Meters in HES on MRO (Meter Reading order) Date.
6. In case of Non-Receipt of Readings through Smart Meter System within MRO Date, readings shall be submitted through Meter Reading Instrument shall be arranged by the bidder at its own cost within the SLA timelines. No separate charge will be paid for the readings /Billing Data Submitted through MRI. Also all such readings are to be routed through HES/MDM.
7. Monthly invoice for FMS shall be submitted for only those meters for which the monthly bills were generated successfully which will be monitored. Taxes applicable, if any, such as GST or any other tax applicable from time to time shall be paid extra.
8. The Bidder shall analyze and identify faulty Smart Meters on daily basis regularly.
9. The Bidder shall carry out the replacement and configuration of Smart Meter at site within Tata Power SoP guidelines.
10. Bidder shall carry-out necessary configuration changes/firmware changes in Mass or Individual meter basis as per the TPC request in defined time period, such as converting the meter from Normal Meter to Pre-paid meter, Net-Meter, Bidder shall ensure smooth conversion of the meter in system with correct data flow.
11. For Pre-paid meters, in case of communication failure between Smart Meter and HES continuously for one day, the bidder shall make alternate arrangements to communicate with meter through optical port, at its own cost. In such cases the bidder should read the meter data through optical port and the downloaded data should be uploaded to HES/MDMS for prepaid application. No payment shall be made by TPC for meters downloaded through optical port. Any failure to meet this requirement shall attract penalty as per SLA with bidder.
12. Replacement of faulty NIC card in meters will be in scope of bidder.
13. Data availability of the field devices shall be taken from the MDM /HES, where missing interval data read report is prepared on hourly, daily, weekly and monthly basis.
14. No Separate changes will be paid for the Readings submitted through hand held Device.
15. For SLA calculation all exceptional cases not attributable to bidder like – power failure, power quality, sabotage, defective meter and issues at server end will be excluded from the calculation.
16. Tata Power reserves the right to exclude specific meters from FMS for specific period with prior information to vendor through mail.
17. Bidder shall provide the rectification report of all meters attended at site as per TPC provided format on daily basis. Bidder will check and attend the priority meters given by Tata Power within 4 hours for upto 10 meters, within 1 day for upto 100 meters and within mutually agreed timelines beyond that.

Penalty:
The following operational penalties shall be applicable on the Bidder and shall be calculated as here under:
Up to 95% - No Penalty
Below 95% and Up to 75% - No payment towards non-communicating Meters. Additionally penalty @ of percentage by which the SLA falls below 95% shall be deducted from the monthly invoice of the vendor.
Below 75 % -No payment shall be made

Note:

1. The designated officer of Tata Power shall verify and certify the invoice through system generated reports; bidder shall provide an interface for verification of the invoice in the software to facilitate the verification authority to compute the availability of meter data on system and amount of applicable penalty.
2. All %ages for SLA are to be calculated over calendar month.
3. One end point consider for a penalty in one parameter will not be consider for penalty for other parameter.
4. There will be penalty of Rs 100 /AMI NIC card / Day for non-communicating for more than 15 days.

5. Non-submission of daily rectification report in Tata Power format, will be penalized at the rate of 100 Rs/ day after 2 days as per rectification schedule, TPC mail.

6. Training and Knowledge Transfer

Bidder should demonstrate the functionality of meter and show the compliance testing of all relevant IS standards. They should demonstrate the local meter communication testing and provide all required softwares and give training for the local reading and troubleshooting like local communication issue and analysis of error codes.

1. Local communication BCS should be given free of cost along with 5 communication cables to connect with laptop.

2. Bidder should facilitate the API / codes / keys/ data models and any other thing required for the integration of Meter with Tata Power HES.

3. Bidder should provide the keys required for Firmware update/ any other config changes without any extra cost and within 1 one working day after formal request throughout meter warranty period

4. Bidder shall provide NIC troubleshooting software to TPC free of cost(including option to check error code/ signal strength/ network latching/ PDP Session etc.)

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.

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.

General Terms and Conditions – Addendum for Open Tender

1. The information contained in this Tender Document or subsequently provided to Bidder, whether verbally or in documentary or any other form by or on behalf of The Tata Power Company Limited herein referred to as Tata Power, or any of its employees, is provided to Bidder on the terms and conditions set out in this Tender Document and such other terms and conditions subject to which such information is provided.

2. Tata Power also does not accept any liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any Bidder upon the statements contained in this Tender Document.

3. Tata Power, and its employees make no representation or warranty and shall have no liability to any person including any Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this Tender Document or otherwise, including the accuracy, adequacy, correctness, reliability or completeness of the Tender Enquiry and any assessment, assumption, statement or information contained therein or deemed to form part of this Tender Document or arising in any way in this Selection Process.

4. Tata Power may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this Tender Document.

5. Though adequate care taken while issuing this Tender Document, Bidder should satisfy himself for completeness of the document in all respects. Intimation of any discrepancy should be given to Tata Power Concerned Person immediately. If no intimation received by this office within 3 days from the date of issue of the Tender Document, then Tata Power shall consider that the document received by the Bidder is complete and to the satisfaction of the Bidder in all respects.

6. Tata Power reserves the right to change any or all of the provisions of this Tender Document before date of submission. Such changes, if any, would be intimated to Authorized Person of Interested Bidder through E-Tender System only.

7. The issue of this Tender Document does not imply that Tata Power is bound to select a Bidder or to appoint the Selected Bidder, as the case may be, for the Contract and Tata Power reserves the right to reject all or any of the Proposals without assigning any reasons and or making any correspondence on this account whatsoever.

8. Bidder shall bear all costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by Tata Power

or any other costs incurred in connection with or relating to its Proposal. All such costs and expenses will remain with the Bidder and Tata Power shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Bidder in preparation or submission of the Proposal, regardless of the conduct or outcome of the Selection Process.

Any Bidder wishing to undertake site visits for familiarization with site conditions, may do so. All costs towards site visits, conference and submission of documents shall be borne by the Bidder themselves.

9. No claim shall be entertained on account of disruption of internet services being used by bidders. Bidders are advised to upload their bids well in advance to avoid last minute technical snag.

10. The decision of Tata Power Management regarding the opening of offers, evaluation and acceptance of the offer shall be final and binding on all the Bidders.

11. Tata Power reserves the right to extend the date of uploads/opening of tenders without assigning any reason thereof, and also reserves the right to distribute the work among more than one bidder.

12. Tata Power reserves the right to accept or reject any offer, and to annul the offer process and reject all offers at any time prior to award of Offer, without thereby incurring any liability to the affected Bidder or any obligation to inform the affected Bidder of the grounds for the Tata Power decision.

13. Tata Power reserves the right to invite open or limited tenders and when tenderers are called to accept a tender in whole or in part or reject any tender or all tenders without assigning any reasons for such action.

14. The authority for the acceptance of the tender will rest with the Tata Power. It shall be obligatory on the said authority to accept the most suitable bid or any other bid and no Bidder shall demand neither any explanation for the cause of rejection of his / their tender nor Tata Power undertake to assign reasons for declining to consider or reject any particular tender or tenders.

15. Local Conditions: It will be imperative on each Bidder to fully acquaint himself with all the local conditions and *factors* which would have any effect on the performance of the contract. Tata Power shall not entertain any request for clarifications from the tenderer regarding such local conditions. No request for the change of price, of time schedule of completion of work on account of any local conditions or factor shall be entertained after the offer is accepted by Tata Power.

16. The intending bidder will be deemed to have satisfied himself by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of

the works are taken into account and that rates he enters in the tender papers are adequate and all inclusive, for the completion of works to the entire satisfaction of Tata Power.

17. Bidder who is Black listed / Banned / Debarred as on originally scheduled date of this bid opening or whose Agreement / Work order has been terminated on account of performance, or a bidder against whom there is adverse report about its performance under an existing contract or a bidders performance security has been forfeited by any company/organization for non-performance at any time shall not be eligible, within 5 (five) years of originally scheduled date of this bid opening by any State / Central Govt. / Govt. Undertaking / Public sector Undertaking in India for similar type of work, will not be eligible for participating in this tender.

18. The bidder should provide detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder may result in rejection of Bid.

19. Conditional and incomplete tenders shall not be accepted. Bid must be in conformity with schedules / formats of this tender.

20. At any stage if it is found that bidder

    a. have submitted false document for the purpose of qualifying in the tender or non-execution of project as per contract,
    b. Have not provided relevant details (for example litigation history etc)

    action as per Law will be taken and the pending payment, Bank Guarantee, EMD, Security amount of the bidder will be forfeited by Tata Power at any stage of execution. Also Bidder will be Blacklisted for future Tenders by Tata Power.

21. Issuance of Tender document does not construe that Bidder will be qualified for award of work.

22. Tata Power reserves the right to verify all statements, information and documents, Submitted by the Bidder in response to Tender Document. Any such verification or the lack of such verification by Tata Power to undertake such verification shall not relieve the Bidder of its obligations or liabilities hereunder nor will it affect any rights of Tata Power there under.

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Appendix 3:
Safety Terms and Conditions

Reason for Change	Date of Last Revision	Prepared By	Reviewed By	Approved by
1.Simplify the procedure 2.Addition of capability building 3.Removal of CFSA 4. Addition of Environment KPI 5.Retention amount is based on Risk involved in Job	11 May 2015 -R1 10 January 2022 -R4	Rajesh Sharma *(Head-Safety Generation)*	Monish Kumar (Chief Corporate Contracts)	Suresh H Khetwani (*Chief safety and Environment*) 14/01/2022

1 Definitions

1.1. **Order Manager:** Order Manager is the Tata Power representative, who has the ownership of the given job.

1.2. **Site Safety Management Plan**: It is the safety plan agreed between Contractor and Tata Power. It will contain the entire job specific safety requirement and will be signed by the contractor.

1.3. **Contractor**: An individual or a company that provides services to Tata Power under a signed contract.

1.4. **Emergency:** a serious, unexpected, or dangerous situation requiring immediate action, which may result in loss of revenue/property, business discontinuity. In case of Emergency*, services may be procured by selecting the qualified vendor based on the vendor category without the safety bid evaluation. It must be approved by MB level and above.

1.5. **Expert Service jobs:** Jobs which needs expert services of contractor which does not involve direct exposure to the potential risk or work which involves only supervisory work such as expert for turbine overhaul, expert for boiler overhaul, expert for pump and motor, expert for compressor overhaul.

1.6. ***CEO/Chief/Head of division/Unit/Utility*:** Business in charge of the division who is overall custodian of the generating station or transmission division or distribution division.

1.7. **Category A Vendor:** Vendor eligible to carry out Very High & High risk (as per Tata Power Hazard Identification and Risk Analysis Procedure) and /or Long-Term Contract related to operation and maintenance (O&M) of plant. Vendors must fulfil the requirement specified for Category A in Appendix 12-CSMF-5 of Contractor Safety Code of Conduct document. Any vendor wants to registration under Category -A shall have ISO 45001/OHSAS 18001 Certification from accredited agency recognised by Tata Power .

1.8. **Category B Vendor:** Vendors eligible to carry out technical jobs, that are classified under Medium /low risk. Vendors must fulfil the requirement specified for Category B in Appendix 12-CSMF-5 of Contractor Safety Code of Conduct document. Any Vendor/Contractor wants to registrar under Category-B shall have ISO 9001 Certification from accreditation agency recognised by Tata Power.

1.9. **Category C Vendor:** Vendors eligible for to carry out low or very low risk administrative and office jobs. For this he must fulfil the requirement specified for Category C in Appendix 12-CSMF-5 of Contractor Safety Code of Conduct

document. Any Vendor/Contractor wants to registrar under Category-C shall have ISO 9001 Certification from accreditation agency recognised by Tata Power.

1.10. **Category D Vendor:** Consultants, Medical Practitioners or vendors taking job from Tata Power and working from their own premises (e.g., motor rewinding at vendor's own shop floor etc.) are classified as Category D Vendor

1.11. **High/Very High-Risk Jobs** A Job or its activities are considered as Very High or High Risk when Order manager apply the "Tata Power Hazard Identification and Risk Analysis" procedure and found safety risk associated with are under Very High or High category. Indicative lists of jobs are given in appendix 15 of this document.

1.12. **Medium Risk Jobs:** Jobs or its activities are considered as medium risk when Order manager apply "Tata Power Hazard Identification and Risk Analysis" procedure and found the same as Medium Risk.

1.13. **Low/*Very low* Risk Jobs:** Any job or its activities are considered as Low or Very low risk while Order manager, calculate it by applying "Tata Power Hazard Identification and Risk Analysis" procedure and found it under Low or Very Low category.

1.14. **Long Duration Jobs:** When the duration of job is 12 months or more, it is considered as Long duration job

1.15. **High Value Jobs:** When the value of the job contract is Rs. One Crore or more it will be considered as High value job.

2 Health and Safety Policy

TATA

HEALTH AND SAFETY POLICY

Tata Power is committed to provide safe and healthy working environment for the prevention of work related injuries and ill-health. Safety is one of our core values. We strive to be a leader in safety excellence in the global power and energy business. In pursuit of this, we are committed to the following:

- **Maintain and continually improve our management systems to eliminate hazards and reduce health & safety risks to all our stakeholders.**
- **Incorporate appropriate health & safety criteria into business decisions for selection of plant and technology, performance appraisal of individuals and appointments in key positions.**
- **Comply and endeavour to exceed all applicable health & safety legal and other requirements**
- **Integrate health & safety procedures and best practices into every operational activity with assigned line-functional responsibilities at all levels.**
- **Involve our employees and business associates in maintaining a safe and healthy work environment through consultation and participation**
- **Inculcate safety culture by visible leadership and empowerment.**
- **Ensure required competency to enable our employees and business associates for working safely.**
- **Promptly report incidents, investigate, share crucial learnings and prevent recurrences.**
- **Influence our business associates in enhancing their health and safety standards and align with Tata Power's health & safety codes and practices.**
- **Set safety & health metrics as indicators of excellence, monitor progress and continually improve health and safety performance.**

We shall ensure the availability of appropriate resources at all times to fully implement and communicate this policy to all stakeholders by suitable means and periodically review its relevance in continuously changing business environment.

(Praveer Sinha)
CEO & Managing Director

Date: 11th March, 2019

TATA POWER

Lighting up Lives!

3. Safety Organization & Responsibilities

3.1 Contractor Site Management and Supervision

Each Contractor will be responsible for fulfilling all statutory and safety requirements as per the laws of the land and not limited to Factory Act, Electricity Act, Electricity Rules and Regulations, Shop and Establishment Act etc.

Each Contractor shall provide at least one competent full-time safety supervisor for workforce of every 50 workers or less than that. When workforce ranges to 500, the contractor must provide at least one qualified safety officer. Thus, for work force of 500 workers there will be one qualified safety officer and 10 safety supervisors. For every 500 addition in workforce, the contractor must add 1 safety officer and 10 safety supervisors. The Tata Power Project Safety Manager will review and approve the appointment of all safety officers and supervisors. Contractor/Subcontractor safety supervisors/officers will work with Tata Power Safety Managers and align themselves with Tata Power safety requirements.

Each Contractors'/Subcontractors' Site Manager is responsible, and will be held accountable, for the safety of their own workforce as well as workforce of sub-contractors. He should also ensure that all equipment, materials, tools and procedures remain in safety compliance at job site, including:

3.1.1 Holding officer/supervisors accountable for safety and actively promote safe work performance.
3.1.2 Participate in and cooperate with all safety program requirements to be implemented in order to meet Tata Power safety objectives.
3.1.3 Ensure timely reporting of safety incidents, near misses, unsafe acts and conditions.
3.1.4 Identify the training needs of its employees and maintain all safety training documents.
3.1.5 Provide safety performance report at an agreed frequency.
3.1.6 Stopping of unsafe work (acts and/or conditions) immediately, until corrective action be taken.
3.1.7 Perform daily toolbox talk for all the jobs
3.1.8 Ensure only tested and certified tools and equipment is issued to workers.

3.2 Contractor Supervisors and General Staff

Contractors' site supervisors and general staff members in charge of job site functions such as field engineering, warehousing, purchasing, cost and scheduling, etc. are responsible for the safe performance of the work of those they supervise. They must set an example for their fellow employees by being familiar with applicable sections of the Site Safety program and ensuring that all site activities are performed with SAFETY as the primary objective.

Each site supervisor is responsible and will be held accountable for identifying, analyzing and eliminating or controlling all hazards through implementation of an aggressive, pro-active Health, Safety and Environmental Program. Each supervisor will proactively participate in the SHE programs by observing, correcting, and recording unsafe acts and conations at plant / sites.

3.3 Contractor Workforce

Site Safety Officer/Safety Supervisor / Safety Coordinator shall be interviewed by the order manager/ safety head of the division and then gate passes shall be issued.

All the contractor employees shall attend "SHE L0 or L1 Foundation Course in Safety". Depending on the critical procedure in job employees shall also be required to attend "SHE L2 course of critical/high risk operations". All Supervisors shall be required to attend "SHE L3 Supervisory Training". All the above trainings will be conducted by TPSDI or other equivalent institute approved by Tata Power.

Contractor employees shall be required to attend any other additional training if suggested by Order Manger or Site Safety Head.

Contractor / Vendor shall mobilize their manpower well in advance to complete the training through TPSDI.

Welder/electricians/fitters/radiographer/rigger mobilized by the Contractor shall have valid competency certificate issued by the authorized agency / institute.

Contractor workforce must make safety a part of their job by following safety rules and regulations and by using all safeguards and safety equipment. They must take an active part in the Plant /Site's Safety program.

Every member of the workforce is expected to report for work without influence of any Drug/Alcohol.
All employees shall report hazardous conditions, practices and behaviors in their work areas and correct wherever possible.

Workforce is responsible for active participation in safety and health programs, suggestion systems, trainings and reporting of unsafe practices, Unsafe conditions incidents and injuries to their supervisors.

3.4 Vendor/Contractor/sub-contractor

Vendors/Contractor shall always comply with and ensure that their workforce comply with all site safety rules and regulations. Specifically, with applicable provisions of the Tata Power Site Safety Management Plan and all statutory safety rules and regulations.
After receiving the work order/ purchase order vendor/contractor/bidder shall not appoint Sub-contractor without safety assessment of the sub-contractor through safety concurrence group Under Contractor Safety Code of Conduct. Penalty of 5% of contract value will be applicable to the contractor if subcontractor is appointed without the permission of SCG and without evaluation through CSCC process.

4 Site Safety Rules and Procedures:

The work in the safest possible manner can only happen when it has been carefully planned and all applicable procedures are followed. The Tata Power Safety Procedures are derived from Tata Power best practices and the applicable Government acts regulations. In each case, the most stringent regulation is used.

4.1 Requirement of Tools and Tackles

- Tools & Tackles used to carry out the job shall be checked and inspected by Order Manager and safety Officer.
- Vendor must submit a valid Certificate from Competent person under the Factories Act 1948 and State Factories Rule for all Lifting Tools and Tackles (like Hoist, D Shackles, chain Block, wire ropes etc.).
- All Electrical Hand Tools must be tested for leakage of current by a person /agency authorized by Tata Power. Electrical power must be taken though RCCB of 30mA. Electrical hand tools should not have cord more than 3 meters in length. If power source is at more than 3 meters, extension boards with RCCB of 30 mA and ON/OFF switch, shall be used.
- Removal or inclusion of tools any new tool /tackles / machinery / equipment at site should only be done with concurrence of the order Manager / Head Officer.

4.2 Critical safety Rules and Procedures

Following is the list of Tata Power's critical Safety Rules and Procedures. Contractor shall refer to approved Rules and Procedures for detailed requirements and ensure conformance.

4.2.1 Lock Out and Tag Out Procedure

This procedure is intended to be used for the protection of Personnel while servicing or performing maintenance on equipment / pipeline / vessel / process systems. This is a general procedure that shall be used as the minimum requirements for isolation of equipment, pipelines, machines, system from all possible sources of hazardous energy and / or material such as Steam, Hot Water, Compressed Air, any other process fluid / chemical energy /Mechanical energy or Electrical energy. For complete procedure kindly refer Procedure Document No. TPSMS/CSP/LOTO/001 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com / sustainability / safety-documents.aspx)

4.2.2 Excavation Safety (Shoring and Sloping) Procedure

This procedure is developed to cover the safe practices required for shoring and sloping in excavation and trenching jobs. This procedure is developed to establish mandatory requirements for practices to protect personnel, property and equipment from hazards associated with above activities. For complete procedure kindly refer Procedure Document No TPSMS/CSP/EXS/002 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.3 Confined Space Entry Procedure

This procedure outlines the steps required to perform the confined space entry and to protect personnel from the hazards of entering and conducting operations in confined spaces. For complete procedure kindly refer Procedure Document No – TPSMS/CSP/CSE/003 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.4 Working at Height Procedure

This procedure describes the rules and procedures to protect employees from the hazards of working at heights.
This procedure is developed to cover the safe practices required for Working at Heights. This procedure is developed to establish mandatory requirements for practices to protect personnel from hazards associated in this area. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/WAH/004 REV 01 available on official website of Tata Power (Link: https://www.tatapower.com / sustainability / safety-documents.aspx)

4.2.5 Heavy Equipment Movement Safety Procedure

Heavy equipment lifting and movement is an activity involving loading, unloading, storage and movement from one place to another including lifting and erection or repairing of equipment with cranes or hoists. Material, machinery and equipment handling operations are being carried out by large capacity cranes and hoists, which make the job safer and faster. This procedure addresses the hazards and precautions associated with such equipment and their use. For complete procedure kindly refer Procedure Document No – TPSMS/CSP/HEMS/005 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.6 Mobile Crane Safety Procedure

Mobile cranes are responsible for many incidents, injuries. Falling loads from mobile cranes pose a severe hazard to operators and nearby workers and property. Many types of cranes, hoists, and rigging devices are used for lifting and moving materials. To maintain safe, appropriate standards must be adhered to and only qualified and licensed

individuals shall operate these devices. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/MCS/006 REV 01. available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.7 Scaffold Safety Procedure

This procedure is developed to provide information on the safe erection, use, dismantling and maintenance of access scaffolding in the workplace. It is developed to establish mandatory requirements for practices to protect personnel from hazards associated with erection, use and dismantling of scaffolds. For complete procedure kindly refer Procedure Document No –TPSMS/CSP/SCAF/007 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.8 Electrical Safety Procedure

The objective of these standards is to specify minimum mandatory requirements and advisory guidance for identifying and controlling hazards to ensure 'Zero Harm' regarding operation maintenance and testing of electrical equipment. For complete procedure kindly refer Procedure Document No- TPSMS/CSP/ELEC/010 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.9 Job Safety Analysis (JSA) Procedure

This objective of this procedure is to have a task-based risk assessment process in place that identifies, evaluates and controls the risks associated with work activities, and as a result, prevents those involved in the task or those potentially affected by the task, from being harmed. For complete procedure kindly refer Procedure Document No-TPSMS/CSP/JSA/009 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.10 Fire Safety Management Procedure

Objective of This standard is to specify the minimum mandatory requirements and advisory guidelines to ensure prevention of fire related incidents and managing / controlling their impacts if they do occur. For complete procedure kindly refer Procedure Document No (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.11 Permit to Work Procedure

Given the inherent hazards of the power generation and distribution industry, a significant number of TATA POWER operations and installations are critical. Work Permit (WP) System is an essential element in controlling the workplace risks in an effective manner.

For complete procedure kindly refer Procedure Document No –TPSMS/CSP/PTW/008 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.12 Lift (Elevator) Safety Procedure

To provide safe operating procedure for taking control of lift car before entering and existing the pit of OTIS make elevators. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/LIFT/001 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.13 Working on conveyor belt Procedure

This procedure is developed to cover the safe practices required for Working on live equipment and to protect personnel from hazards associated with it. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/CONV/002 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.14 Handling Hazardous Materials Procedure

This Procedure is developed to provide procedure for recycling and / or safe disposal of used / waste batteries in compliance with all legislation. For complete procedure kindly refer Procedure Document No-TPSMS/GSP/HAZM/003 REV 01
available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx)

4.2.15 Material Handling and Storage Procedure:

The purpose of this document is to provide procedures to assist the safe handling of materials (manual handling and mechanical handling). For complete procedure kindly refer Procedure Document No – TPSMS/GSP/MATL/004 REV 01 available on official website of Tata Power (www.tatapower.com) (Link: https://www.tatapower.com/sustainability/safety-documents.aspx).

4.2.16 Contractor Safety Management Procedure

The purpose of this document is to engage with contractors in a way to create safe work environment for everyone working for Tata Power. For complete procedure kindly refer Procedure Document No – TPSMS/GSP/CSM/015 REV 01 available on official website of Tata Power (www.tatapower.com)

The above procedures will be updated time to time and the updated version of the procedures as well as any additional critical procedure will be available on official website of Tata Power (www.tatapower.com) for your reference.

4.3 Other Conditions:

- No Supervision No work policy should strictly be followed.
- HIRA /JSA as per the job scope must be prepared in detail and submitted along with Site Safety Plan by the successful bidder.
- Personal protective equipment (PPE) must always be checked before use to ensure that they are in good condition and clean. Replace them if necessary.
- All relevant PPE shall be provided by the vendor while working at the site.
- Housekeeping shall be maintained all the time while execution of work. All the unwanted material shall be removed from the site at the end of the day's work. Old/damaged parts if taken out of the system shall be kept at identified placed and it shall be shifted to scrap yard or disposed of as per instruction of order manager.
- Site Safety Plan shall be prepared by successful bidder along with order manger. Appendix 1 to be filled by successful bidder and submitted to Tata Power safety in-charge, before mobilization of team at site and start of the work.

5 Training and Capability Building

Safety Training and capability building of workforce is a major component of safety management program. All training required must be provided and documented as specified by Tata Power and Indian Regulations. Tata Power Safety Manager will audit contractors training and related documentation to assure its adequacy.

5.1 Tata Power Site Safety Orientation

All Tata Power contractor and subcontractor workforce is required to attend Tata Power Site Safety Orientation Training to receive a Safety Training Card, which is required to obtain a Gate Pass to the site, prior to entry.

This Safety Orientation Course will be for duration of minimum half day. The information provided during the orientation will include, but is not limited to following:

1. Job rules, personal safety, and conduct
2. Hazard's reporting
3. Reporting of injuries
4. Emergency procedures
5. Safety Activities and Program including disciplinary measure and incentives.
6. Critical safety procedure relevant to the job

5.2 Capability Building

5.2.1 ***Capability Building.*** Appropriate training such as SHE L0, L1, L2 and L3 shall be completed by job- holder, either supervisor or worker, to do his/her job safely. The skill training is provided through TPSDI and other agencies authorized by Tata Power on the list critical Safety procedures given from 4.2.1 to 4.2.14. Duration of training will be as

specified by Tata Power. These trainings are on chargeable basis and rates are decided by TPSDI and Tata Power from time to time. Contractor shall ensure that concerned workmen are provided with adequate training before he / she can execute the work. An evaluation test will be conducted after the completion of the training. Those employees who meets the minimum required competency will be provided with Certificate (Card), which will be valid for 3 years, post which the workmen must reappear for 1 day refresher training and assessment.

5.2.2 If the workman is not able to qualify the assessment, he/she will be given 3 additional attempts to clear in 3-month time failing which he/she will not be allowed to work in Tata Power.

5.2.3 Recognition to the Prior Learning (RPL) in Safety: If "Order Manger" recommends and "Head of the Safety Department of division" is satisfied with the safety knowledge and competency of the employee of contractor a test (RPL) may be conducted by TPSDI / other recognised institute to assess the prior learning in safety. If employees of the contractors will pass in such test, he will be exempted from appearing in SHE L1 training.

5.2.4 Quarterly Revalidation Test: After every three months, "SHE L1 Revalidation test" will be conducted for the contractor's employees to revalidate their safety awareness and knowledge.

5.2.5 Order Manager and Safety In charge of the Division/Site /Plant will conduct a Competency Assessment of all workforce, going to be deployed at site / plant for high-Risk job.

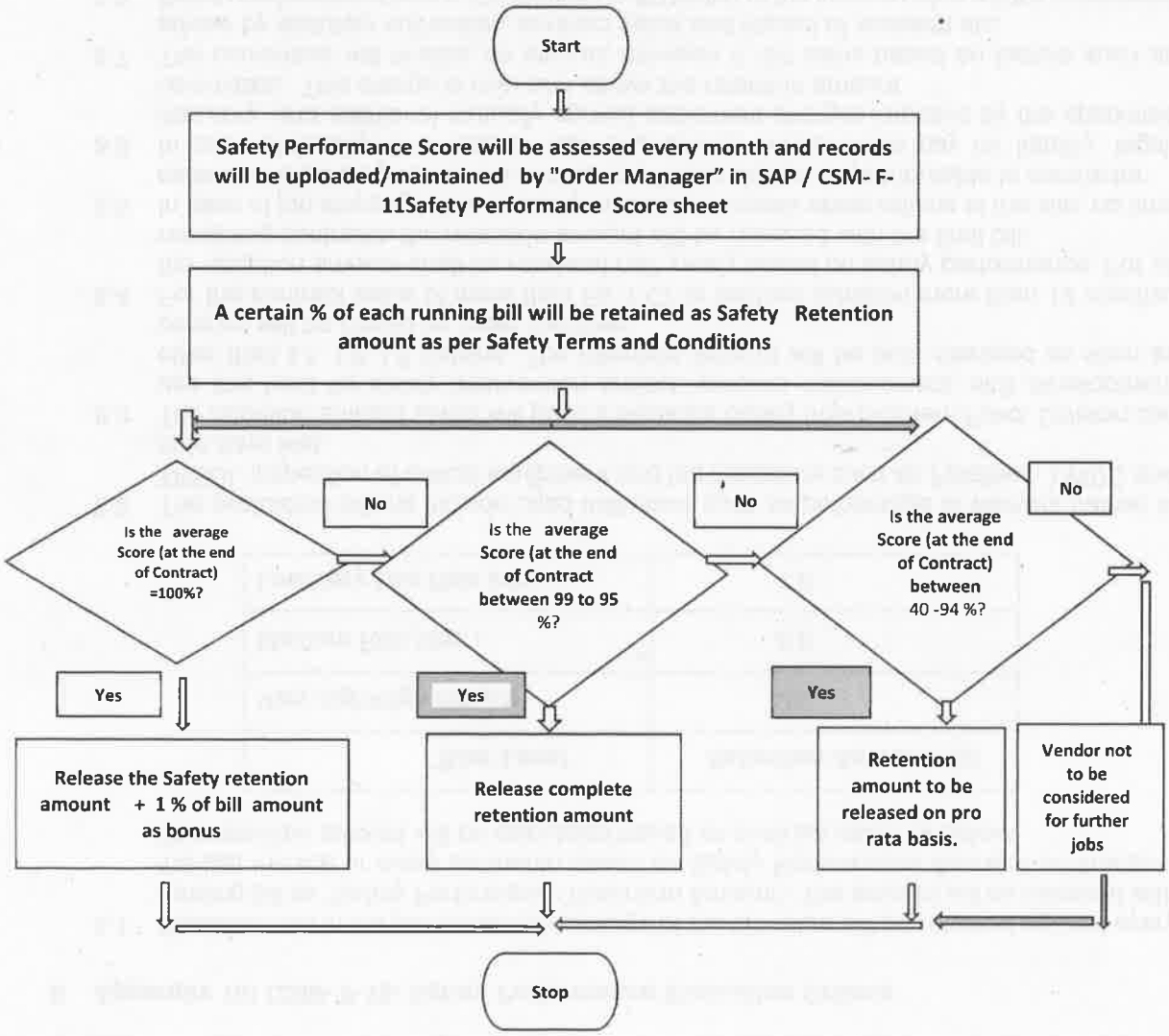
6 Pre-Employment and Periodic Medical check up

Contractor shall arrange to conduct a pre-employment and periodic medical check-up for its entire workforce by Tata Power medical officer or Tata Power authorized medical officer. The contractor shall be able to produce the certificate prior to the employment. The contractor shall also organize to conduct periodical medical checkup (six monthly) for the following category of employees:

- Drivers (Check for Vision & Hearing)
- HEM Equipment Operators (Check for Vision & Hearing)
- Workforce working at Height (Check for Vision, Hearing, Vertigo & Height Phobia)
- Workforce Handling the hazardous substances - Coal, ash and chemicals (Chest X-ray and Lung Function T)
- Workforce in high Noise area (> 90 Decibel), Check for Hearing
- Workforce handling radiography equipment for conducting NDT.
- Workforce, working in specific areas requiring specific medical attention should conduct the medical test as laid down in the respective Site Safety Management Plan.

7 Safety Performance Evaluation and Penalties:

During job execution, regular site inspection will be carried out by the Tata Power officials. Safety violations will be dealt as per CSM–F4 Safety Violation Penalty Criteria. Apart from the above, "Monthly Safety Performance" of the contractor will be evaluated based on the predetermined criteria as per CSM-F11. Safety Performance Score and monthly score will be maintained un-SAP by the Order Manager. Certain percentage of each running bill will be retained as Safety Retention amount and will be released on the basis of Safety Performance Score at certain intervals as defined in CSM- F-3- Safety Performance Evaluation Criteria. Please refer Appendix 10: Process Flow Chart for Safety Performance Evaluation. Percentage of retention amount is also given below:



8 Appendix 10: CSM- F-10- Safety Performance Evaluation Criteria

8.1 Based on risk in the job certain percentage of the bill value will be retained against every running bill as "Safety Performance Retention Amount". The amount will be released with the last invoice or every six-month based on Safety Performance Score of contractors. The retention amount will be calculated based on contract value as below:

Risk Level	***Retention Amount (%)***
Very high/High risk job	*2.5*
Medium Risk jobs	*2.0*
Low/Very Low Risk jobs	*1.0*

8.2 The evaluation criteria include Lead Indicators such as percentage of workers trained in TPSDI, inspection of critical equipment and lag indicators such as Fatalities, LWDC and man days lost.

8.3 The retention amount saved will go to a separate Safety Improvement Fund. Division can use this fund for safety intervention project, process improvement, skill development other than L1, L2, L3 training. The retention amount will be auto released as soon as contract will be closed by order manager.

8.4 For the contract value of more than Rs 1 Cr or contract duration more than 12 months, the retention amount shall be released half yearly based on safety performance. For all remaining contracts, the retention amount will be released with the final bill.

8.5 In case of job stoppage due to safety violations / unsafe observations at the site, no time extension shall be given to the contractor, if such delays are attributable to contractor.

8.6 In case of fatality, limb loss or loss of property, vendor must pay for liability, legal, statutory, and additional mutually agreed settlement charges imposed by the appointed committee. This charge is over and above the retention amount.

8.7 The committee will finalize an amount between 5 -50 lakhs based on factors such as advise by statutory authorities, contract value and impact of accident etc.

8.8 Safety performance bonus 1% (limiting to 50 lakhs) of the invoice value will be considered at the end of the job if the contractual safety performance score 100%.

8.9 During the progress of the work, concerned Supervisor/Engineer will visit and inspect the work site regularly and evaluate the safety performance of the contractor based on matrix attached herewith and apply the Consequence management policy as applicable.

8.10 Order Manager, divisional chief and SBU head have the authority to terminate the contract in case of three consecutive serious violations.

9 Appendix 11: CSM- F-11 Safety Performance Score

Sr. No.	Parameter	Unit of Measurement	Target	Weight age	Actual Performance	Actual Score
Lead Indicator						
1	% of Employee certified in TPSDI/Authorized agency	Number	100%	20		
2	Monthly inspection completed for Critical Equipment, lifting Tools & Tackles and hand tools used at site *by contractor*	Number	80%	15		
3	Condition of critical tools, tackles and equipment *to be checked by order manager*	Number	100%	10		
4	*Safe (designated way) Disposal of Waste generated*	-		*10*		
5	*Records of waste (Hazardous Waste – Oily cotton waste – E- waste etc.) generation*					
6	*No Effluents to drain*					
7	*No effluents/discharges to ground*					
Lag Indicator						
1	Number of Fatalities	No	0	*15*		
2	Number of Lost workday case (LWDC) (reportable)	No	0	10		
3	*Numbers of total reportable cases*	*No*	*0*	*10*		
4	Man-days Lost	Man-days	0	10		
					Final Score	
					Invoice Value	
					Amount to be released	

10 Revised Penalty Chart for Safety Violations (Unsafe Acts and Unsafe Conditions)

Penalty shall be imposed on the contractors under the following circumstances for breaching the contractual agreements:

Sr No	Description of violation	Severit Index	Penalty
1.	Working without Permit	5	5000/-
2.	Untrained (TPSDI) worker on high-risk jobs.	5	5000/-
3.	Unhygienic/Bad condition of PPE	2	250/-
4.	Not following Tata Power Procedure & Standard	4	2000/-
5.	Unsafe Act/Condition of Severity 4	4	2000/-
6.	Unsafe Act/Condition of Severity 5	5	5000/-
7.	No Earthling of Electrical equipment	5	5000/-
8.	Damaged welding cable	5	5000/
9.	Violation of Positive Isolation Procedure (LOTO Not followed)	5	5000/
10.	ELCB of more than 30 mA/ELCB not working	5	5000/
11.	On/Off switch of welding m/c not working	5	5000/
12.	Electric cable tied with metal wire	5	5000/
13.	Leakage found DA hose / cylinder	5	5000/
14.	Use of LPG	5	5000/
15.	Use of IC engine-based Three-wheeler at the work site.	5	5000/
16.	Starting the job without Toolbox Talk	5	5000/
17.	Spatter falling on DA hose / Gas-line/ pathways / Equipment	5	5000/
18.	No safety latch in crane hook	5	5000/
19.	Load raised or swung over people or occupied areas of buildings	5	5000/
20.	Persons standing in swing area of construction equipment.	5	5000/
21.	Using damaged slings.	5	5000/
22.	Unstable scaffolding/nonstandard Scaffolding in use	5	5000/
23.	Handrails and mid-rails are missing	5	5000/
24.	Safety Harness not anchored with lifeline/fixed structure	5	5000/
25.	Fall arrestor not provided/ Not being used.	5	5000/
26.	Double lifeline not used for working at height	5	5000/
27.	No rubber mat in Electrical Distribution (DB) room	4	2000/-
28.	Water found accumulated in Electrical Distribution room/near welding machine.	4	2000/
29.	Inserting electric cables into socket, without using plug.	4	2000/
30.	Use of damaged electrical cable/two core cables.	4	2000/
31.	Inflammable material found in Distribution Room / welding areas.	4	2000/
32.	Loose material falling into excavated pit	4	2000/
33.	Water logging into excavated pit /trenches	4	2000/
34.	No / inadequate Barricade	4	2000/
35.	Undercut / cave-in found on sides of excavated pits	4	2000/
36.	Grinding wheel/ Coupling/ Piling winch/other rotating parts without guard	4	2000/

37.	The HMV/Mobile Crane operator does not have a valid HMV driving license.	4	2000/
38.	The loading area is not leveled properly.	4	2000/
39.	Ladder not anchored at top	4	2000/
40.	Opening found in working platform of scaffolding/floor	4	2000/
41.	Inadequate illumination at the working area	4	2000/
42.	Loose material lying on Gantry, platform	4	2000/
43.	Cleaning with Compressed Air.	3	500/-
44.	Gas Cylinders using without cap.	3	500/
45.	Gas Cylinders stored without securing	3	500/
46.	Bringing inside any other chemicals, apart from approved by Safety dept.	3	500/
47.	Using drum for sitting or accessing height.	3	500/
48.	Misusing emergency facilities like fire hydrant line/ hose box/ spray system/ eye wash etc.	3	500/
49.	No provision of Safety net where falling materials or tools may occurs	3	500/
50.	Taking electrical supply from non-designated outlet (other than socket).	3	500/
51.	Restricted gangways due to unwanted materials.	3	500/
52.	Not reporting incident.	3	500/
53.	Entering into restricted area like switch yard/ hazardous storage	3	500/
54.	Work without supervision	3	500/
55.	Parking of vehicle without applying wheel choke at right front-front and left rear-rear wheels other than passenger cars.	3	500/
56.	Heavy Vehicle without helper or co-driver.	3	500/
57.	Not wearing florescent safety jacket at site.	3	500/
58.	People travelling in load body of vehicle.	3	500/
59.	Parking of vehicles at non designated area.	3	500/
60.	Shifting heavy materials without guide ropes.	3	500/
61.	Using other than 24V lamp inside the confined space/Use of other than 24V lamps.	3	500/
62.	Angular loading/ lifting with Crane or hoist.	3	500/
63.	By passing the limit switch/ Safety Interlock.	3	500/
64.	Housekeeping activities on road without proper barricade.	3	500/
65.	Trying to board or alit from running vehicle.	3	500/
66.	Cylinder Valves of Gas cylinders not closed when not in use.	3	500/
67.	Flash-back arrester not used.	3	500/
68.	Hand Trolley wheel found damaged.	3	500/
69.	Guy ropes of required length on both sides of object are not used during movement with load.	3	5/ 00/
70.	Scotch block/wedge not provided, when the vehicle is parked.	3	500/

71.	Suitable Trolley not provided to hold the cylinders.	3	500/
72.	Locked First Aid box	3	500/
73.	Caution boards, danger signs (luminescent /red) along with emergency contact number are not found displayed.	3	500/
74.	Person found jumping barricading tape	3	500/
75.	Stacking of pipes, pile casing, drums without chock blocks/wedges	3	500/
76.	The terrain on which Heavy Equipment/Machinery moves is not reasonably hard.	3	500/
77.	Without Safety Helmet at working sites	4	250/-
78.	Without Crash Helmet (on bikes)	4	500/-
79.	Without Full body double lanyard Safety Harness (for work at height)	5	5000/-
80.	Without Hand gloves - Material Handling, Welding, Cutting,	4	100/-
81.	Without Safety goggles/ face shield - Welding/Cutting /Grinding	5	5000/-
82.	Handling Chemical without PVC Apron	5	5000/-
83.	Smoking in prohibited area (e.g. Go down / Warehouse / Store of flammable material etc. / Area prone to dust explosion)	5	1000/-
84.	Sleeping at Workplace	3	100/-
85.	Driving beyond speed limit	3	1000/-
86.	Seat Belt While Driving (for front seat passengers and driver)	3	500/-
87.	Driving without license	4	1000/-
88.	Heavy Commercial vehicles without reverse horn	3	500/-
89.	Nonfunctional Head light/ taillight and side indicators	3	100/-
90.	Using Mobile Phone During Driving	5	5000/-
91.	Poor visibility of registration number/ without registration number	3	100/-
92.	Broken/ without Side view mirror	3	100/-
93.	Over speeding above specified limit	3	500/-
94.	Broken/ Without Pressure gauge on Oxygen/ LPG / Acetylene cylinder.	3	500/-
95.	Without Flash back arrestor on Industrial Acetylene & Oxygen cylinders.	5	5000/-
96.	Spillage of hazardous material/chemicals during transportation	4	2000/-
97.	Electrical equipment without Earthing/ ELCB/ Double Insulation Cable.	5	5000/-
98.	Lifting Tools & Tackles used without/ expired Test Certificates.	5	5000/-
99.	Housekeeping repeatedly not maintained		
100.	• First Time	3	Warning
101.	• Second Time	4	1000/-

102.	• Third Time	5	5000/-
103.	Serious Violation of House Keeping (after 1st or 2nd warning to be decided by Project Manager depending on the severity)	5	Rs.10000/- and above
104.	Repeat Violation of same nature	5	5 X Penalty for Violation
105.	Appointment of subcontractor without his Safety Bid Evaluation and/or without the permission of engineer in charge or Order manager.	5	5% of Contract Value

Safety Bid Document

Safety PQR Requirement

If the job is ''High Risk " or “High Value " or " Long duration” then Tata Power Corporate Contracts Department will attach following documents along with the Request for Quotation (RFQ):

1) Tata Power Safety Terms and Conditions (attached Separately)
2) Tata Power CSM- F7-Safety Competency Form
3) Tata Power CSM-F8-PPE Requirements

If the job is not coming under "High Risk /High value /Long duration” than the RFQ will be contain only "Tata Power Safety Terms and Conditions"

CSM-F7-Safety Competency Form

Name of the Vendor/Bidder :-

Name of the Sub Vendor **(If job is given to Sub Vendor)** **:-**

Description of the Job :-

Request for Quotation (RFQ) No. :-

Vendor/Bidder to mandatorily provide the below safety competency related information.

1. **Proposed Manpower Deployment Schedule** :-

Category of Manpower Deployed	Minimum Qualification & Experience	Proposed Numbers against each category month-wise			
		Month 1	Month 2	…	Month n
Project Manager					
Site-In-Charge (Site Manager)					
Shift-in-Charge					
Safety Officers					
Supervisors					
Technicians					
a……					
b……					
Highly Skilled Workmen					
a……					
b……					
Skilled Workmen					
Semi-Skilled Workmen					
Unskilled Workmen					
Total Manpower					

Instructions to Bidder to fill:

1. Bidder to provide the overall site manpower deployment schedule as above.
2. Bidder to indicate (through colour code mentioned below) their direct and sub-contracted employees

Direct bidder employee
Partly Direct / Partly sub-contracted
Sub-Contracted

3. Against each of the category, bidder to indicate the minimum qualification and experience of the proposed manpower.
4. Rows can be added to also identify other specialised manpower e.g. specific details to be included for high risk activities operators
5. Columns can be extended to the actual duration of Site activities.
6. Bidder to note that if operations is in shifts, then Shift-in-charge / safety officers are required for each shift of operation.

2. List of Tools ,Tackles & Equipments :-

Bidder/Vendor to provide the list of tools, tackles, equipments to be used during the job/ project execution. Bidder/Vendor to ensure that all the lifting tools and tackles, pressure vessels are duly certified by the competent person authorised by the Chief Inspector of Factories of the respective state prior to start of the job

Sr. No.	Description of Tools / Tackles	Capacity / Rating	Quantity	Make	Remarks
1					
2					
3					
4					
5					
6					
7					
...					

3. Safety Records:

Bidder to provide the details of fatalities and lost work day cases (LWDC) which may happened during the last three years (data to be provided for the last completed year and preceding 2 years).

Description	Safety Data for Last 3 Years		
	Year 1	Year 2	Year 3
	20__ - __	20__ - __	20__ - __
Fatalities (Nos.)			
Lost Work Day Cases (Nos.)			

In case of no fatalities, LWDC during any year, the form may be filled stating NIL against the respective year. Bidders are encouraged to also submit the RCA / incident investigation reports and the learning's implemented out of the above reported incidents

4. Job Safety Plan/ Method Statement:

Bidder to provide / enclose a detailed Site/Job Safety Plan along with a Method statement detailing the execution philosophy (how the bidder intends to execute the Job/Project), identifying all key activities which are required to be performed by the contractor at Site. Bidder to also list down all high risk activities and provide the Hazard Identification and Risk Assessment (HIRA) for all such high risk activities involved in the site work.

5. Accreditations:

Sr.	Certification	Yes / No	If Yes, Year of Certification	If No, Planned date for Certification
1.	ISO 9001			
2.	ISO 14001			
3.	OSHAS 18001			
4.	Any other (please specify…….)			
Note: Please attach certificates to support above. In case not accredited for above but applied for, application letters may be attached.				

CSM-F8-PPE Requirements

The Bidder/Vendor shall ensure that the following PPE of Approved standards shall be available at all time and shall be used by his employees with no exception whatsoever.

1	All contractor's employees at site	Safety Florescent Jacket (orange colour), Safety helmet & safety shoes with steel toe cap
2	Workers mixing asphalt , cement , lime / concrete	Safety goggle & protective Hand gloves and footwear, Nose mask.
3	Welders / Grinders	Welding screen/goggles , safety shoes, leather hand gloves, aprons , leg guard
4	Stone breaker	Protective goggle, hearing protection, anti vibration hand gloves and Protective clothing.
5	Electricians	Rubber hand gloves & Electrical resistant shoes.
6	Workers engaged in insulation using glass wool etc.	Respiratory mask & leather Hand gloves, goggles.
7	Workers engaged in coal handling plant, ash handling plant and working in high dust area.	Dust mask, Hand gloves, protective goggles.
8	Workers working at a height of 1.8 Meter or above.	Double lanyard full body harness, Fall arrestor and safety net made of reinforced nylon fiber ropes firmly supported with steel structures

• PPE shall be conforming to BIS/DGMS/DIN specifications, in good condition and shall be comfortable to his employees, when used.

HEALTH AND SAFETY POLICY

We, at Tata Power, reaffirm our belief that the health and safety of our stakeholders is of the utmost importance and takes precedence in all our business decisions. In pursuit of this belief and commitment, we strive to:

- Maintain and proactively improve our management systems to minimize health and safety hazards to our stakeholders and all others influenced by our activities.
- Comply and endeavour to exceed all applicable occupational health & safety legal and other requirements by setting the highest standards.
- Integrate health & safety procedures and best practices into every operational activity with assigned line-functional responsibilities at all levels, for improving and sustaining health & safety performance.
- Involve our employees in maintaining a safe and healthy work environment through risk assessments, periodic reviews of operational procedures, safe work methods and adoption of new technology.
- Develop a culture of safety through active leadership and provide appropriate training at all levels to enable employees developing their skills to work safely.
- Incorporate appropriate health & safety criteria into business decisions for selection of plant and technology, performance appraisal of individuals and appointments in key positions.
- Ensure availability at all times of appropriate resources to fully implement the health & safety policy of the company.
- Promptly report incidents, investigate for root causes and ensure lessons learnt shared and deployed across the company.
- Ensure service providers and their workmen align with company's safety codes and practices for the health and safety of personnel working with us.
- Set safety & health metrics as indicators of excellence, monitor progress and continually improve performance.

We shall actively communicate this policy to all stakeholders by suitable means and periodically review its relevance in continuously changing business environment.

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER

Lighting up Lives!

CORPORATE ENVIRONMENT POLICY

Tata Power is committed to a clean, safe and healthy environment, and we shall operate our facilities in an environmentally sensitive and responsible manner. Our commitment to environmental protection and stewardship will be achieved by:

- Complying with the requirements and spirit of applicable environmental laws and striving to exceed required levels of compliance wherever feasible
- Ensuring that our employees are trained to acquire the necessary skills to meet environmental standards
- Conserving natural resources by improving efficiency and reducing wastage
- Making business decisions that aim towards sustainable development
- Engaging with stakeholders to create awareness on sustainability

Date: 15th June, 2018

(Praveer Sinha)
CEO & Managing Director

TATA POWER
Lighting up Lives!

CORPORATE SUSTAINABILITY POLICY

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

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

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

(Praveer Sinha)
CEO & Managing Director

Date: 15th June, 2018

TATA POWER
Lighting up Lives!

TATA CODE OF CONDUCT 2015

LEADERSHIP THAT INSPIRES

For over 100 years, the Tata group has been led by visionaries who have stayed true to the vision of the founder, Jamsetji Tata.
A vision that placed the greater good of society at par with business growth.
A vision that put into practice pioneering social initiatives that changed the way responsible business was run.
And a vision that brought into the group a strong social conscience.

We do not claim to be more unselfish, more generous or more philanthropic than other people. But we think we started on sound and straightforward business principles, considering the interests of the shareholders our own, and the health and welfare of the employees, the sure foundation of our success.

Jamsetji Tata
Founder of the Tata group
Chairman (1868 – 1904)

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FOREWORD

Tata companies have consistently adhered to the values and ideals articulated by the Founder for over 150 years. The Tata Code of Conduct was first formalized by Mr Ratan Tata. It articulates the Group's values and ideals that guide and govern the conduct of our companies as well as our colleagues in all matters relating to business. Today, the Code is a bedrock on which we base our individual, as well as leadership commitments to core Tata values.

The Tata Code of Conduct outlines our commitment to each of our stakeholders, including the communities in which we operate, and is our guiding light when we are sometimes faced with business dilemmas that leave us at ethical crossroads. The Code is also dynamic in that it has been periodically refreshed in order to remain contemporary and contextual to the changes in law and regulations. However it remains unaltered at its core.

Our stellar reputation and success as a business entity has been defined by the powerful commitment and adherence to the core values and principles expressed in this Code, by all our employees, directors and partners. I trust every Tata colleague and Tata company will continue to not only comply with the laws and regulations that govern our business interests around the world, but will continue to set new standards of ethical conduct that will generate deep respect and inspire emulation by others.

N. Chandrasekaran
21st February, 2017

A. OUR VALUES

TATA has always been values-driven. The five core values that underpin the way we conduct our business activities are:

INTEGRITY

We will be fair, honest, transparent and ethical in our conduct; everything we do must stand the test of public scrutiny.

UNITY

We will invest in our people and partners, enable continuous learning, and build caring and collaborative relationships based on trust and mutual respect.

RESPONSIBILITY

We will integrate environmental and social principles in our businesses, ensuring that what comes from the people goes back to the people many times over.

PIONEERING

We will be bold and agile, courageously taking on challenges, using deep customer insight to develop innovative solutions.

EXCELLENCE

We will be passionate about achieving the highest standards of quality, always promoting meritocracy.

These universal values serve as the foundation for the Tata Code of Conduct. They find expression within the value system of every Tata company.

B. SCOPE AND PURPOSE OF THIS CODE

1. This Code sets out how we behave with:
   - our employees, or those who work with us;
   - our customers;
   - the communities and the environment in which we operate;
   - our value-chain partners, including suppliers and service providers, distributors, sales representatives, contractors, channel partners, consultants, intermediaries and agents;
   - our joint-venture partners or other business associates;
   - our financial stakeholders;
   - the governments of the countries in which we operate; and
   - our group companies.
2. In this Code, "we or us" means our company, our executive directors, officers, employees and those who work with us, as the context may require.
3. The term "our group companies" in this Code typically means companies Tata Sons intends for this Code to apply to, and / or to whom Tata Sons has issued this Code.
4. This Code sets out our expectations of all those who work with us. We also expect those who deal with us to be aware that this Code underpins everything we do, and in order to work with us they need to act in a manner consistent with it.

REMEMBER...

It is our commitment to protect our reputation and our brand equity by adhering to the values and principles set out in this Code. By doing so, we strengthen our unique culture and identity.

OUR CORE PRINCIPLES

The Tata philosophy of management has always been, and is today more than ever, that corporate enterprises must be managed not merely in the interests of their owners, but equally in those of their employees, of the consumers of their products, of the local community and finally of the country as a whole.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

C. OUR CORE PRINCIPLES

1. We are committed to operating our businesses conforming to the highest moral and ethical standards. We do not tolerate bribery or corruption in any form. This commitment underpins everything that we do.
2. We are committed to good corporate citizenship. We treat social development activities which benefit the communities in which we operate as an integral part of our business plan.
3. We seek to contribute to the economic development of the communities of the countries and regions we operate in, while respecting their culture, norms and heritage. We seek to avoid any project or activity that is detrimental to the wider interests of the communities in which we operate.
4. We shall not compromise safety in the pursuit of commercial advantage. We shall strive to provide a safe, healthy and clean working environment for our employees and all those who work with us.
5. When representing our company, we shall act with professionalism, honesty and integrity, and conform to the highest moral and ethical standards. In the countries we operate in, we shall exhibit culturally appropriate behaviour. Our conduct shall be fair and transparent and be perceived as fair and transparent by third parties.
6. We shall respect the human rights and dignity of all our stakeholders.
7. We shall strive to balance the interests of our stakeholders, treating each of them fairly and avoiding unfair discrimination of any kind.
8. The statements that we make to our stakeholders shall be truthful and made in good faith.
9. We shall not engage in any restrictive or unfair trade practices.
10. We shall provide avenues for our stakeholders to raise concerns or queries in good faith, or report instances of actual or perceived violations of our Code.
11. We shall strive to create an environment free from fear of retribution to deal with concerns that are raised or cases reported in good faith. No one shall be punished or made to suffer for raising concerns or making disclosures in good faith or in the public interest.
12. We expect the leaders of our businesses to demonstrate their commitment to the ethical standards set out in this Code through their own behaviour and by establishing appropriate processes within their companies.
13. We shall comply with the laws of the countries in which we operate and any other laws which apply to us. With regard to those provisions of the Code that are explicitly dealt with under an applicable law or employment terms, the law and those terms shall take precedence. In the event that the standards prescribed under any applicable law are lower than that of the Code, we shall conduct ourselves as per the provisions of the Code.

REMEMBER...

"Good faith" means having a reasonable belief that the information you have provided is truthful. It does not mean having 'all the evidence' about the potential violation or case reported.

OUR EMPLOYEES

Once you got the best people, the people who shared our values and ideals, we left them free to act on their own. We do not fetter them. We encourage them and give them opportunities for leadership.

J.R.D. Tata
Chairman, Tata Sons (1938 – 1991)

D. OUR EMPLOYEES

Equal opportunity employer

1. We provide equal opportunities to all our employees and to all eligible applicants for employment in our company. We do not unfairly discriminate on any ground, including race, caste, religion, colour, ancestry, marital status, gender, sexual orientation, age, nationality, ethnic origin, disability or any other category protected by applicable law.
2. When recruiting, developing and promoting our employees, our decisions will be based solely on performance, merit, competence and potential.
3. We shall have fair, transparent and clear employee policies which promote diversity and equality, in accordance with applicable law and other provisions of this Code. These policies shall provide for clear terms of employment, training, development and performance management.

Q&A

A job requirement entails extensive travel. One of the candidates has excellent relevant experience and qualifications. However, this candidate is a single parent. As a result, I feel such a situation would significantly hinder this candidate's ability to cope with the job requirement. What should I do?

In accordance with the Code, the decision to recruit an employee should be based upon merit. We cannot make a presumption that the candidate would not be able to meet the travel requirements of the job. All eligible candidates should be provided with equal opportunity to demonstrate or justify that they can cope with the travel requirements of the job. Being a single parent cannot be a ground to be discriminated against at any stage of recruitment or ongoing employment in our company.

REMEMBER...

We do not tolerate harassment in any form and therefore we expect every employee to discourage such misdemeanours in the workplace.

Dignity and respect

4. Our leaders shall be responsible for creating a conducive work environment built on tolerance, understanding, mutual cooperation and respect for individual privacy.
5. Everyone in our work environment must be treated with dignity and respect. We do not tolerate any form of harassment, whether sexual, physical, verbal or psychological.
6. We have clear and fair disciplinary procedures, which necessarily include an employee's right to be heard.
7. We respect our employees' right to privacy. We have no concern with their conduct outside our work environment, unless such conduct impairs their work performance, creates conflicts of interest or adversely affects our reputation or business interests.

Human rights

8. We do not employ children at our workplaces.
9. We do not use forced labour in any form. We do not confiscate personal documents of our employees, or force them to make any payment to us or to anyone else in order to secure employment with us, or to work with us.

Bribery and corruption

10. Our employees and those representing us, including agents and intermediaries, shall not, directly or indirectly, offer or receive any illegal or improper payments or comparable benefits that are intended or perceived to obtain undue favours for the conduct of our business.

REMEMBER...

Violation by even a single employee of any law relating to anti-bribery, anti-corruption, anti-competition, data privacy, etc. could result in severe financial penalties and cause irreparable reputational damage to the company.

Gifts and hospitality

11. Business gifts and hospitality are sometimes used in the normal course of business activity. However, if offers of gifts or hospitality (including entertainment or travel) are frequent or of substantial value, they may create the perception of, or an actual conflict of interest or an 'illicit payment'. Therefore, gifts and hospitality given or received should be modest in value and appropriate, and in compliance with our company's gifts and hospitality policy.

Freedom of association

12. We recognise that employees may be interested in joining associations or involving themselves in civic or public affairs in their personal capacities, provided such activities do not create an actual or potential conflict with the interests of our company. Our employees must notify and seek prior approval for any such activity as per the 'Conflicts of Interest' clause of this Code and in accordance with applicable company policies and law.

REMEMBER...

As a general rule, we may accept gifts or hospitality from a business associate, only if such a gift:

- has modest value and does not create a perception (or an implied obligation) that the giver is entitled to preferential treatment of any kind;
- would not influence, or appear to influence, our ability to act in the best interest of our company;
- would not embarrass our company or the giver if disclosed publicly.

The following gifts are never appropriate and should never be given or accepted:

- gifts of cash or gold or other precious metals, gems or stones;
- gifts that are prohibited under applicable law;
- gifts in the nature of a bribe, payoff, kickback or facilitation payment*;
- gifts that are prohibited by the gift giver's or recipient's organisation; and
- gifts in the form of services or other non-cash benefits (e.g. a promise of employment).

(*'Facilitation' payment is a payment made to secure or speed up routine legal government actions, such as issuing permits or releasing goods held in customs.)

Working outside employment with us

13. Taking employment, accepting a position of responsibility or running a business outside employment with our company, in your own time, with or without remuneration, could interfere with your ability to work effectively at our company or create conflicts of interest. Any such activity must not be with any customer, supplier, distributor or competitor of our company. Our employees must notify and seek prior approval for any such activity as per the 'Conflicts of Interest' clause of this Code and in accordance with applicable company policies and law.

Integrity of information and assets

14. Our employees shall not make any wilful omissions or material misrepresentation that would compromise the integrity of our records, internal or external communications and reports, including the financial statements.

15. Our employees and directors shall seek proper authorisation prior to disclosing company or business-related information, and such disclosures shall be made in accordance with our company's media and communication policy. This includes disclosures through any forum or media, including through social media.

16. Our employees shall ensure the integrity of personal data or information provided by them to our company. We shall safeguard the privacy of all such data or information given to us in accordance with applicable company policies or law.

17. Our employees shall respect and protect all confidential information and intellectual property of our company.

18. Our employees shall safeguard the confidentiality of all third party intellectual property and data. Our employees shall not misuse such intellectual property and data that comes into their possession and shall not share it with anyone, except in accordance with applicable company policies or law.

19. Our employees shall promptly report the loss, theft or destruction of any confidential information or intellectual property and data of our company or that of any third party.

Q&A

I am an accountant in the finance department of my company. Due to my artistic skills, I received an offer to pen cartoons for a children's publication for which I would receive compensation. I plan to undertake this activity during week-ends. What should I do before accepting this offer?

Before accepting the offer, you should ascertain whether the company policies and rules require you to make a disclosure to your supervisor so that the company may determine whether your undertaking this activity adversely affects our company's interests. On confirmation from the company that it does not do so, you would be free to take up the activity. It is also your duty to bring to the attention of the company whenever there is any change in the situation you have disclosed.

20. Our employees shall use all company assets, tangible and intangible, including computer and communication equipment, for the purpose for which they are provided and in order to conduct our business. Such assets shall not be misused. We shall establish processes to minimise the risk of fraud, and misappropriation or misuse of our assets.

21. We shall comply with all applicable anti-money laundering, anti-fraud and anti-corruption laws and we shall establish processes to check for and prevent any breaches of such laws.

Insider trading

22. Our employees must not indulge in any form of insider trading nor assist others, including immediate family, friends or business associates, to derive any benefit from access to and possession of price sensitive information that is not in the public domain. Such information would include information about our company, our group companies, our clients and our suppliers.

Q&A

Our company has recently announced the launch of a new business initiative. In connection with this, your friend who is a journalist with a leading business newspaper has asked you to provide some information that he could cover in his forthcoming article. He has promised not to quote you, or reveal your identity. Should you be giving him this information?

No. You should not be sharing information of this nature with the media, even if it is assured that the source would remain anonymous. Only authorised personnel in the company are permitted to speak to the media and provide information of this nature.

Our company has a "Use of Social Media" policy that lays down the "dos and don'ts" for use of social media even if you may access such media on your own time. Why is there such a policy?

External communication is a serious matter. It must be carefully managed because information put out with reference to our company or its businesses needs to be clear, truthful and not violate any undertakings we have given to other parties. In each business there are managers nominated to authorise and make different types of statements to the outside world. These managers should be consulted about any request for information you may receive or information you think we should give out.
In using social media, in particular blogs or social networking sites, you should exercise great caution while talking about our company or the business we do. It may feel like you are chatting with friends or expressing a personal opinion but even while doing so you cannot share any confidential information of our company.

REMEMBER...

We must respect the property rights of others by never misusing their assets, intellectual property or trade secrets, including the copying or downloading of unauthorised software, trademarks, copyrighted material or logos. We should never make unauthorised copies of computer software programs or use unlicensed personal software on company computers.

Prohibited drugs and substances

23. Use of prohibited drugs and substances creates genuine safety and other risks at our workplaces. We do not tolerate prohibited drugs and substances from being possessed, consumed or distributed at our workplaces, or in the course of company duties.

Conflicts of interest

24. Our employees and executive directors shall always act in the interest of our company and ensure that any business or personal association *including close personal relationships* which they may have, does not create a conflict of interest with their roles and duties in our company or the operations of our company. Further, our employees and executive directors shall not engage in any business, relationship or activity, which might conflict with the interest of our company or our group companies.

25. Should any actual or potential conflicts of interest arise, the concerned person must immediately report such conflicts and seek approvals as required by applicable law and company policy. The competent authority shall revert to the employee within a reasonable time as defined in our company's policy, so as to enable the concerned employee to take necessary action as advised to resolve or avoid the conflict in an expeditious manner.

26. In the case of all employees other than executive directors, the Chief Executive Officer / Managing Director shall be the competent authority, who in turn shall report such cases to the Board of Directors on a quarterly basis. In case of the Chief Executive Officer / Managing Director and executive directors, the Board of Directors of our company shall be the competent authority.

Q&A

You are responsible for maintaining our company's customer database. One of your friends is starting a business venture and requests you to share a few particulars from this database for marketing purposes of his business. He assures you that he would keep the data as well as his source confidential. Should you do so?

No. You should respect the confidentiality of customer information and not share any part of the database with any person without due authorisation.

You have access to revenue numbers of different business units of our company. While having a conversation with you over evening drinks, your friend enquires about the financial performance of our company. You do not share detailed information with your friend, but share approximate revenue figures. Is this conduct of yours correct?

No, it is not. You are not permitted to share financial information of our company with others who do not need to know this information. Financial information should always be safeguarded and disclosed only on a need-to-know basis after obtaining requisite approvals. Sharing of any price sensitive information that is not generally available with the public could also lead to violation of applicable insider trading laws.

27. Notwithstanding such or any other instance of conflict of interest that exists due to historical reasons, adequate and full disclosure by interested employees shall be made to our company's management. At the time of appointment in our company, our employees and executive directors shall make full disclosure to the competent authority, of any interest leading to an actual or potential conflict that such persons or their immediate family (including parents, siblings, spouse, partner, children) or persons with whom they enjoy close personal relationships, may have in a family business or a company or firm that is a competitor, supplier, customer or distributor of, or has other business dealings with, our company.

REMEMBER...

A conflict of interest could be any known activity, transaction, relationship or service engaged in by an employee, his/her immediate family (including parents, siblings, spouse, partner, and children), relatives or a close personal relationship, which may cause concern (based upon an objective determination) that the employee could not or might not be able to fairly perform his/her duties to our company.

Examples of Potential Conflicts of Interest

A conflict of interest, actual or potential, arises where, directly or indirectly, an employee or executive director:

(a) engages in a business, activity or relationship with anyone who is party to a transaction with our company;

(b) is in a position to derive an improper benefit, personally or for any family member or for any person in a close personal relationship, by making or influencing decisions relating to any transaction;

(c) conducts business on behalf of our company or is in a position to influence a decision with regard to our company's business with a supplier or customer where a relative of, or a person in close personal relationship with, an employee or executive director is a principal officer or representative, resulting in a personal benefit or a benefit to the relative;

(d) is in a position to influence decisions with regard to award of benefits such as increase in salary or other remuneration, posting, promotion or recruitment of a relative or a person in close personal relationship employed in our company or any of our group companies;

(e) undertakes an activity by which the interest of our company or our group companies can be compromised or defeated; or

(f) does anything by which an independent judgement of our company's or our group companies' best interest cannot be exercised.

28. If there is a failure to make the required disclosure and our management becomes aware of an instance of conflict of interest that ought to have been disclosed by an employee or executive director, our management shall take a serious view of the matter and consider suitable disciplinary action as per the terms of employment. In all such matters, we shall follow clear and fair disciplinary procedures, respecting the employee's right to be heard.

Examples of activities normally approved (post-disclosure) as per applicable company policy

Acceptance of a position of responsibility (whether for remuneration or otherwise) in the following cases would typically be permitted, provided the time commitments these demand do not disturb or distract from the employee's primary duties and responsibilities in our company, and are promptly disclosed to the relevant competent authority:

(a) Directorships on the Boards of any of our group companies, joint ventures or associate companies.

(b) Memberships/positions of responsibility in educational/professional bodies, where such association will promote the interests of our company.

(c) Memberships or participation in government committees/bodies or organisations.

Q&A

You are in a relationship with a colleague who has been recently moved into your team and would now be reporting to you. What should you do?

Romantic or close personal relationships with another employee where a reporting relationship exists and one is responsible for evaluating the other's performance, is likely to create a conflict of interest. In such a situation, you would need to report the potential conflict to your supervisor.

Your company is submitting a proposal to a company in which you were previously employed. You have confidential information pertaining to your previous employer, which you believe will help your present employer in winning the contract. Should you share this information?

No. You should not share this information with your company since it relates to confidential information of a third party. Your company respects its employees' duty to protect confidential information that they may have relating to their previous employers.

You are the purchasing manager in the procurement department of your company. You receive an invitation from a supplier to attend a premier sporting event as her guest. This particular supplier is one of the vendors who has submitted a proposal for an open tender issued by your company. Should you accept the invitation?

No. You should not accept the invitation in this instance. Since you are in a key decision-making role for the tender, any unusual benefit that you receive could be perceived as an inducement that could compromise your objectivity.

OUR CUSTOMERS

We have continued to enjoy prosperity, even with adverse times to fight against. Our relations with all concerned are the most friendly. We have maintained the same character for straight-forward dealing with our constituents and customers. Our productions have continued to be of the same high quality, and therefore command the best reputation and realise the highest prices. … I mention these facts only to point out that with honest and straight-forward business principles, close and careful attention to details, and the ability to take advantage of favourable opportunities and circumstances, there is a scope for success.

Jamsetji Tata
Founder of the Tata group
Chairman, Tata Sons (1868 – 1904)

E. OUR CUSTOMERS

Products and services

1. We are committed to supplying products and services of world-class quality that meet all applicable standards.
2. The products and services we offer shall comply with applicable laws, including product packaging, labelling and after-sales service obligations.
3. We shall market our products and services on their own merits and not make unfair or misleading statements about the products and services of our competitors.

Export controls and trade sanctions

4. We shall comply with all relevant export controls or trade sanctions in the course of our business.

Fair competition

5. We support the development and operation of competitive open markets and the liberalisation of trade and investment in each country and market in which we operate.
6. We shall not enter into any activity constituting anti-competitive behaviour such as abuse of market dominance, collusion, participation in cartels or inappropriate exchange of information with competitors.
7. We collect competitive information only in the normal course of business and obtain the same through legally permitted sources and means.

Dealings with customers

8. Our dealings with our customers shall be professional, fair and transparent.
9. We respect our customers' right to privacy in relation to their personal data. We shall safeguard our customers' personal data, in accordance with applicable law.

Q&A

You are the Regional Sales Manager of our company. You have become a member of an "informal group", on an instant messaging service, whose members are the regional sales heads of our company's competitors. The administrator of the group has requested an in-person meeting to informally discuss market conditions and brainstorm on "pricing strategy" from an industry perspective. What should you do?

Any meeting with competitors, especially to discuss "pricing strategy", could be an attempt to promote an anti-competitive practice or manipulate prices. You should respond by declining this invitation and exiting the "informal group". You should also report this incident to your supervisor and your Legal department.

You are attending a customer meeting with a colleague, and your colleague makes an untruthful statement about the company's services. What should you do?

You should assist your colleague in correcting the inaccuracy during the meeting if possible. If this is not possible, raise the issue with your colleague after the meeting to enable him/her or the company to correct any misrepresentation made to the customer.

While working on a customer project, you receive a call from your colleague. He used to manage that customer account before you took over his role. He recalls that he had worked with the customer on developing a new ordering system which he thinks would be beneficial for another customer and requests you to send him the project details. What should you do?

You must not share this information without specific approval of the customer; you are not permitted to use a customer's assets, including software, for another customer or for any personal use.

REMEMBER...

Striving for excellence in the standards of our work and in the quality of our goods and services is a core Tata value. It is the unwavering practice of this value that builds and sustains customer trust in our brand.

OUR COMMUNITIES AND THE ENVIRONMENT

> In a free enterprise, the community is not just another shareholder in business but is in fact the very purpose of its existence.

Jamsetji Tata

Founder of the Tata group
Chairman, Tata Sons (1868 – 1904)

F. OUR COMMUNITIES AND THE ENVIRONMENT

Communities

1. We are committed to good corporate citizenship, and shall actively assist in the improvement of the quality of life of the people in the communities in which we operate.
2. We engage with the community and other stakeholders to minimise any adverse impact that our business operations may have on the local community and the environment.
3. We encourage our workforce to volunteer on projects that benefit the communities in which we operate, provided the principles of this Code, where applicable, and in particular the 'Conflicts of Interest' clause are followed.

The environment

4. In the production and sale of our products and services, we strive for environmental sustainability and comply with all applicable laws and regulations.
5. We seek to prevent the wasteful use of natural resources and are committed to improving the environment, particularly with regard to the emission of greenhouse gases, consumption of water and energy, and the management of waste and hazardous materials. We shall endeavour to offset the effect of climate change in our activities.

OUR VALUE-CHAIN PARTNERS

If we had done some of the things that some other groups have done, we would have been twice as big as we are today. But we didn't, and I would not have it any other way.

J.R.D. Tata

Chairman, Tata Sons (1938 – 1991)

(on the pace of expansion of the Tata group in the 1960s and 70s)

G. OUR VALUE-CHAIN PARTNERS

1. We shall select our suppliers and service providers fairly and transparently.
2. 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.
3. Our suppliers and service providers shall represent our company only with duly authorised 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.
4. 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.
5. We respect our obligations on the use of third party intellectual property and data.

Q&A

You head the procurement function in our company. You have tight budgetary constraints for a project that you are working on. In order to complete the project within the targeted costs, you intend to request your supplier to provide you an exceptional discount on this project order on the understanding that you would "make it up to him" in future orders. Would you be violating the Code?

Yes, you would. Inducement in any form, including future benefits to the supplier, could compromise your ability to act objectively and in the best interests of the company and therefore must be avoided.

REMEMBER...

Our value-chain partners would include our suppliers and service providers, distributors, sales representatives, contractors, channel partners, consultants, intermediaries and agents; joint-venture partners and other business associates.

OUR FINANCIAL STAKEHOLDERS

Ethical behaviour in business – in every sphere and with all constituents – has been the bedrock on which the Tata group has built, and operates, its enterprises. This has been an article of faith for the group ever since its inception, a fundamental element of our cherished heritage and the essence of our way of life.

Ratan Tata
Chairman, Tata Sons (1991 – 2012)

H. OUR FINANCIAL STAKEHOLDERS

1. We are committed to enhancing shareholder value and complying with laws and regulations that govern shareholder rights.
2. We shall inform our financial stakeholders about relevant aspects of our business in a fair, accurate and timely manner and shall disclose such information in accordance with applicable law and agreements.
3. We shall keep accurate records of our activities and shall adhere to disclosure standards in accordance with applicable law and industry standards.

GOVERNMENTS

Business, as I have seen it, places one great demand on you; it needs you to impose a framework of ethics, values, fairness and objectivity on yourself at all times. It is not easy to do this; you cannot impose it on yourself forcibly because it has to become an integral part of you.

Ratan Tata
Chairman, Tata Sons (1991 – 2012)

I. GOVERNMENTS

Political non-alignment

1. We shall act in accordance with the constitution and governance systems of the countries in which we operate. We do not seek to influence the outcome of public elections, nor to undermine or alter any system of government. We do not support any specific political party or candidate for political office. Our conduct must preclude any activity that could be interpreted as mutual dependence/favour with any political body or person, and we do not offer or give any company funds or property or other resources as donations to any specific political party, candidate or campaign.

   Any financial contributions considered by our Board of Directors in order to strengthen democratic forces through a clean electoral process shall be extended only through the Progressive Electoral Trust in India, or by a similar transparent, duly-authorised, non-discriminatory and non-discretionary vehicle outside India.

Government engagement

2. We engage with the government and regulators in a constructive manner in order to promote good governance. We conduct our interactions with them in a manner consistent with our Code.

3. We do not impede, obstruct or improperly influence the conclusions of, or affect the integrity or availability of data or documents for any government review or investigation.

OUR GROUP COMPANIES

I do not think anyone was on par with Jamsetji as an industrial visionary. But that is not the sole reason why I have been an admirer of Jamsetji. The major reason was his sense of values, sterling values, which he imparted to this group. If someone were to ask me, what holds the Tata companies together, more than anything else, I would say it is our shared ideals and values which we have inherited from Jamsetji Tata.

J.R.D. Tata
Chairman, Tata Sons (1938 – 1991)

J. OUR GROUP COMPANIES

1. We seek to cooperate with our group companies, including joint ventures, by sharing knowledge, physical resources, human and management resources and adopting leading governance policies and practices in accordance with applicable law including adherence to competition law, where relevant.
2. We shall strive to achieve amicable resolution of any dispute between us and any of our group companies, through an appropriate dispute resolution mechanism so that it does not adversely affect our business interests and stakeholder value.
3. We shall have processes in place to ensure that no third party or joint venture uses the TATA name/brand to further its interests without proper authorisation.
4. Our Board of Directors shall consider for adoption policies and guidelines periodically formulated by Tata Sons and circulated to group companies.

Q&A

You are in the process of selecting potential vendors for an IT project in our company. In the final shortlist of two companies, one is a new start-up with limited references and a lower price-quotation, while the other is a Tata company with thirty years of implementation experience and good references, but a marginally higher quote for the same job. With all other parameters of choice being nearly equal, which company should you select for the job?

While price is undoubtedly an important criterion for decision making, it is clearly not the only one to be evaluated. You may also need to consider good customer references, proven track record and shared value systems in order to decide on your IT partner.

You are in the process of selecting potential vendors for a project. One of the three finalists is a group company. In reviewing the final proposals, you rank the group company second out of the three proposals based on pricing and total cost of ownership, and select the first-ranked vendor. Is this the right decision?

Yes. You should select the vendor that, on its own merits, is the vendor that is most appropriate for your company's requirements. You should not select a group company only because of its affiliation.

RAISING CONCERNS

We encourage our employees, customers, suppliers and other stakeholders to raise concerns or make disclosures when they become aware of any actual or potential violation of our Code, policies or law. We also encourage reporting of any event (actual or potential) of misconduct that is not reflective of our values and principles.

Avenues available for raising concerns or queries or reporting cases could include:

- immediate line manager or the Human Resources department of our company
- designated ethics officials of our company
- the 'confidential reporting' third party ethics helpline (if available)
- any other reporting channel set out in our company's 'Whistleblower' policy.

We do not tolerate any form of retaliation against anyone reporting legitimate concerns. Anyone involved in targeting such a person will be subject to disciplinary action.

If you suspect that you or someone you know has been subjected to retaliation for raising a concern or for reporting a case, we encourage you to promptly contact your line manager, the company's Ethics Counsellor, the Human Resources department, the MD/CEO or the office of the group's Chief Ethics Officer.

My supervisor has asked me to do something which I believe may be illegal. I am afraid if I do not do what I am told, I could lose my job. Should I do it?

No. Breaking the law is never an option. Discuss the situation with your supervisor to be certain that you both understand the facts. If your concerns are not resolved, contact a higher level supervisor, the Ethics Counsellor, the Legal department or report them via the company's confidential reporting system, if available.

I feel that my supervisor is treating me unfairly for reporting a concern to the Ethics Counsellor. What should I do?

Retaliation against anyone who raises a concern is a violation of the Code. You should therefore promptly report this action of your supervisor to the Ethics Counsellor or the MD/CEO of your company or via the company's confidential reporting system, if available.

ACCOUNTABILITY

This Code is more than a set of prescriptive guidelines issued solely for the purpose of formal compliance. It represents our collective commitment to our value system and to our core principles.

Every person employed by us, directly or indirectly, should expect to be held accountable for his/her behaviour. Should such behaviour violate this Code, they may be subject to action according to their employment terms and relevant company policies.

When followed in letter and in spirit, this Code is *'lived'* by our employees as well as those who work with us. It represents our shared responsibility to all our stakeholders, and our mutual commitment to each other.

SPEAK UP...

If you are unsure whether a particular action you are about to take is consistent with the principles set forth in the Code, ask yourself:

- Could it directly or indirectly endanger someone or cause them injury?
- Is it illegal/unlawful or out of line with our policies and procedures?
- Does my conscience reject it? Does it conflict with my personal values?
- Would I feel uncomfortable if the story appeared in the media? Would it shame my company, spouse, partner, parent or child?
- Does it 'feel' wrong?

If the answer to any of these questions is "Yes", please stop and consult your reporting manager, the Ethics Counsellor, the Human Resource department, the Legal department or any member of the senior management team, to assist you in making the decision.

When faced with a dilemma: Stop, Think, Act Responsibly

NOTE

The Code does not provide a comprehensive and complete explanation of all expectations from a company standpoint or obligations from a stakeholder standpoint.

Our employees have a continuing obligation to familiarise themselves with all applicable law, group-level advisories and policies, company-level policies, procedures and work rules as relevant. For any guidance on interpretation of the Code, we may seek support from our company's Ethics Counsellor or from the group's Chief Ethics Officer, as appropriate.

All joint ventures are encouraged to adopt the Tata Code of Conduct (TCOC) or a code of conduct that incorporates all elements of the TCOC.

This version of the Tata Code of Conduct supersedes all earlier versions and associated documents and stands effective from 29th July, 2015.

For any query or clarification on the Code, please contact the office of the group's Chief Ethics Officer via email at: ethicsoffice@tata.com.

TATA CODE OF CONDUCT – 2015

I acknowledge that I have received the Tata Code of Conduct.

I have read the Tata Code of Conduct and I acknowledge that as a Tata employee, I am required to comply with the guidelines described therein and failure to do so may subject me to action as per my employment terms and relevant company policies.

If I have a concern about a violation, or a potential violation of the Tata Code of Conduct, I understand that there are channels available to me in my company to report such concerns. By making use of these channels when necessary, I will play my part in maintaining the high ethical standards to which we hold ourselves.

Signature: _____

Date: _____

Name: _____

Department: _____

Address: _____

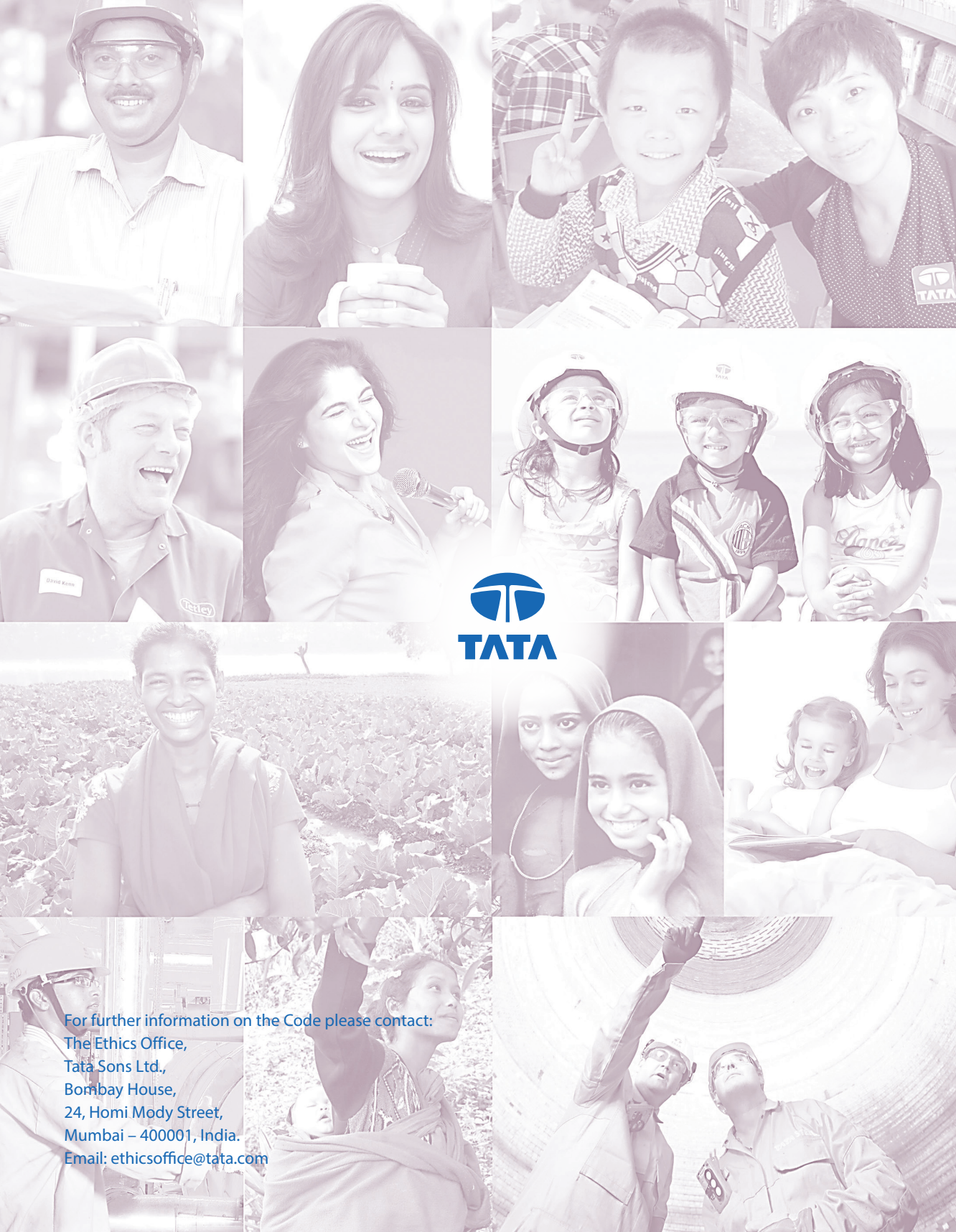
_____

_____

(Please submit this declaration to your Ethics Counsellor or the Human Resource department of your company.)

NOTES

NOTES



TATA

For further information on the Code please contact:
The Ethics Office,
Tata Sons Ltd.,
Bombay House,
24, Homi Mody Street,
Mumbai – 400001, India.
Email: ethicsoffice@tata.com