

Volume - I

Tender Notification for

**Single Phase and Three Phase Smart meter with HES Prepaid
Engine and SIM card
NIT : CMC/BY/18-19/RB/VKS/041**

Date : 08.08.2018

Due Date for Submission of Bids : 29.08.2018

**BSES YAMUNA POWER LTD (BYPL)
SHAKTI KIRAN BUILDING, KARKARDOOMA,
DELHI-110032
CIN: U74899DL2001PLC111525
TEL: 011 3999 9808
WEBSITE: www.bsedelhi.com**

SECTION - I

REQUEST FOR QUOTATION

2018-19

Tender Notification : CMC/BY/18-19/RB/VKS/041

**Event : Procurement of Single Phase and Three Phase Smart meter
with HES Prepaid Engine and SIM card**

Date : 08.08.2018

INDEX

SECTION - I: REQUEST FOR QUOTATION	4
SECTION - II: INSTRUCTIONS TO BIDDER	9
SECTION - III: GENERAL CONDITIONS OF CONTRACT.....	17-25
1.0 GENERAL INSTRUCTIONS.....	18
2.0 DEFINITION OF TERMS.....	18
3.0 CONTRACT DOCUMENTS & PRIORITY	19
4.0 SCOPE OF SUPPLY -GENERAL.....	19
5.0 QUALITY ASSURANCE AND INSPECTION	18
6.0 PACKING, PACKING LIST & MARKING.....	20
8.0 TERMS OF PAYMENT AND BILLING.....	21
9.0 PRICE VALIDITY	22
10.0 PERFORMANCE GUARANTEE.....	22
11.0 FORFEITURE	22
12.0 RELEASE	22
13.0 DEFECTS LIABILITY PERIOD	22
14.0 RETURN, REPLACEMENT OR SUBSTITUTION.....	23
15.0 EFFECTIVE DATE OF COMMENCEMENT OF CONTRACT:	22
16.0 TIME - THE ESSENCE OF CONTRACT.....	23
17.0 THE LAWS AND JURISDICTION OF CONTRACT:.....	23
18.0 EVENTS OF DEFAULT.....	23
19.0 CONSEQUENCES OF DEFAULT.	23
20.0 PENALTY FOR DELAY	24
21.0 FORCE MAJEURE.....	24
22.0 TRANSFER AND SUB-LETTING.....	26
23.0 RECOVERIES	26
24.0 WAIVER.....	26
25.0 INDEMNIFICATION.....	26
SECTION - IV: QUANTITY AND DELIVERY REQUIREMENT	28
SECTION - V: TECHNICAL SPECIFICATION	29-51

SECTION - I: REQUEST FOR QUOTATION

1.00 Event Information

1.01 BYPL invites Sealed tenders for supply of Meters from reputed manufacturers.

The bidder must qualify the technical requirements as specified in clause 2.0 stated below. The sealed envelopes shall be duly superscribed as – **“BID FOR Single Phase and Three Phase Smart meter with HES Prepaid Engine and SIM card AS PER SPECIFICATION TENDER NOTICE CMC/BY/18-19/RB/VKS/041. DUE FOR SUBMISSION ON DT:29.08.2018.**

S.no	Material Description	Specification	Requirement	Estimated
	BYPL		Total Qty	Cost
1	MTR,ENERGY,10-60A,1PH, SMART PREPAID	Section V	10000 Nos.	₹ 5.31 Cr
2	MTR,ENERGY,20-80AMP,3PH, SMART PREPAID		2000 Nos.	

Note : Quantity may vary to any extent of +/- 30% of above mentioned total quantity.

1.02 The schedule of specifications with detail terms & conditions can be obtained from address given below against demand draft/Pay Order of ₹ 1180 per set- drawn in favour of **BSES YAMUNA POWER LIMITED**, payable at Delhi. The sale of tender documents will be issued from 08.08.2018 onwards on all working days upto 29.08.2018. The tender documents can also be downloaded from the website **“www.bsedelhi.com”**. However, it is advisable to inform BYPL about your interest in tender.

In case tender papers are downloaded from the above website, then the bidder has to enclose a demand draft covering the cost of bid documents as stated above in a separate envelope with suitable superscription – **“Cost of Bid Documents:Tender Notice Ref:CMC/BY/18-19/RB/VKS/041**. This envelope should accompany the Bid Documents.

1.03 Offers will be received at 14:00 Hrs on dt. **29.08.2018** as indicated earlier will be opened on the same day at the address given below on **29.08.2018 at 14:30 Hrs** in the presence of authorized representatives of the bidders.. The schedule of specifications with detail terms & conditions are enclosed. It is the sole responsibility of the bidder to ensure that the bid documents reach this office on or before the due date.

**HEAD OF THE DEPARTMENT,
3rd FLOOR, 'A' BLOCK,
CONTRACTS & MATERIALS DEPARTMENT,
BSES YAMUNA POWER LTD,
SHAKTI KIRAN BUILDING,
KARKARDOOM, NEW DELHI**

1.04 BYPL reserves the right to accept/reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:

(i). Earnest Money Deposit (EMD) @ 1% (One percent) of the Tender value i.e ₹ 5,31,000 /- is not deposited in shape of Bank Guarantee executed on favour of BSES YAMUNA POWER LIMITED.

(ii). The offer does not contain **“FOR, NEW DELHI price indicating break-up towards all taxes & duties”**.

- (iii). Complete Technical details are not enclosed.
- (iv). Sample is not submitted along with the offer.
- (v). Tender is received after due time due to any reason.

2.0 Qualification Criteria:-

The prospective bidder must qualify all of the following requirements to be eligible to participate in the bidding Bidders who meet following requirements will be considered as successful bidder and management has a right to disqualify those bidders who do not meet these requirements.

1. The bidder must be a meter manufacturer of static meter.
 2. The bidder shall either themselves be manufacturers of the equipment offered or accredited representatives of such manufacturers in India or of their Principals abroad with whom they may be having collaboration Such accreditation should be at least of one year preferably last year as on date of tender. Authority letter from manufacturer shall be attached along with bid.
 3. Relevant documents (Joint Venture) in support of the above must be furnished along with undertaking of the manufacturers. If these documents are not furnished along with the tenders the offer will be rejected summarily.
 4. Bidder should have supplied atleast 5000 meters of each type of required meters in last three years and manufacturer or accredited representatives should have experience of supplying to Electricity Distribution Utility/ Undertaking in India with electronic display.
 5. Offered meters should be in successful operation since at least last 2 year as on the date of opening of Bid.
 6. This should be supported by the copies of purchase orders and performance reports from the SEBs/Power Utilities should be Enclosed. Existing supplier with good track record in terms of quality and timely delivery will get preference.
 7. The bidder must possess valid ISO 9001:2008 certification for meter manufacturing and must possess valid BIS Licence.
 8. Firms who are debarred/blacklisted in other utilities in India will not be considered, a undertaking shall be submitted by the bidder.
 9. The Bidder should have turnover of ₹ 20 Cr in any one of the last three financial years (i.e.2014-2015, 2015-2016 & 2016-2017) **related to metering item only**. Bidder should submit report on financial standing such as profit and loss statement, balance sheets for the last three years, along with bankers certificates for turnover of only of metering item only.
 10. The audited financial statements of accounts for the last three years submitted by bidder shall be evaluated and last year of audited accounts should show positive net worth.
 11. Bidder should have complete volume of type test reports as per relevant IS from any NBAL accredited lab. The type test report should not be older than 2 years as on the date of opening of tender.
 12. Manufacturer has to demonstrate and provide the software to acquire data and made available in required format.
 13. In case of new bidders (not enlisted in BSES), Factory inspection & evaluation may be carried out to ascertain bidder's manufacturing capabilities and quality procedures.
 14. The manufacturer should have following facility to meet both quality and quantity requirement of supplies. Buyer can audit manufacturers works for quality checks in event of order.
- 14.1 Computerized test bench:** The manufacturer should have sufficient Nos of Computerized test benches. The benches should have electronic supply, Isolated CT/ PT system and data should be directly stored in central server.
- 14.2 Seal tracking system:** The manufacturer has to put both his own seal and BSES seal(s) on the meter. He should have a seal tracking software to ensure tracking of seal and no duplication of seals and meter nos,.

- 14.3 Meter Burn In system:** In order to ensure the reliability of components and that there is no drift in meter accuracy with time; the manufacturer should have burn in facility --- Running meter with load at elevated temperature.
- 14.4 Routine test data:** During lot acceptance, all routine test data should be made available to inspector. In fact as per BIS, STI all test data should be offered to inspector for verification. **Routine test report should be packed with each meter.**
- 14.5 Test benches:** During the lot acceptance, BSES inspector can test up to 5% of offered quantity. The manufacturer should agree to provide all test facility to do so. Further he should allow BSES inspector to check shop floor process. The place of inspection should be clearly marked in tender and same should be well equipped.
- 14.6 Test equipments:** Since the meters has lot of anti theft features, the manufacturer should have test set up to check the working of all anti theft features. Same should be available during lot inspection, otherwise inspector has a right to withdraw inspection.
- 14.7 PCB assembly facility:-** The PCB facility should have auto- pick n place machine, in- circuit tester, Protection against static charge/ dust etc.; and process to ensure no corrosion of solder points/ tracks. In case service is taken from other vendor than bidder shall arrange inspection of facility. The bidder should be taking the service from the vendor since last two years and so far have procured & one million meter PCB from vendor.

The manufacturer should send the compliance of above mentioned parameters in technical offer and has to give an undertaking about **No Objection** to verify his manufacturing facility as a part of tender process. Further in relevance to above clause (13.1 to 13.7), vendor should submit details of facilities.

3.00 Bidding and Award Process

Bidders are requested to submit their questions regarding the RFQ or the bidding process after review of this RFQ. BYPL response to the questions raised by various bidders will be distributed to all participating bidders through an RFQ Update. Otherwise BYPL will organize a prebid meeting to clarify all doubts on **dated 29.08.2018 at 14:00 Hrs.**

a. Time schedule of the bidding process

The bidders on this RFQ package should complete the following within the dates specified as under:

S. No.	Steps	Activity description	Due date
1	Technical Queries	<ul style="list-style-type: none"> ▪ All Queries related to RFQ 	On or before Pre-bid meeting
2	Technical Offer	<ul style="list-style-type: none"> • It include clause by clause commentary, GTP, Type test report from NABL Lab(Not more than 2 year old), BIS report, Quality assurance plan, Deviation from the specs, component deviation, undertaking of software protocol, List of Plant and machinery, list of anti theft testing equipment available at work. • Receipt of tender sample submission. • Compliance of Qualification criteria (cl. 2.0) and Documentary evidence in support of qualifying criterion as per format attached in Annexure V. • Acceptance of delivery, commercial terms and conditions. • Deviation from the General Conditions of the contract/commercial terms and conditions. • Original Tender documents duly stamped and signed on 	29.08.2018, 14:00 Hrs

S. No.	Steps	Activity description	Due date
		each page as token of acceptance.	
3	Commercial Officer	<ul style="list-style-type: none"> Prices for meters. No separate price for additional feature. Break up regarding basic price and taxes as per format enclosed vide Annexure III. Delivery commitment 	29.08.2018, 14:00 Hrs
4	Samples (2nos.)	<ul style="list-style-type: none"> Sample with meter routine report as per bidder offer. Samples will be submitted at BYPL Laboratory, at Savita vihar New Delhi on or before the due date Sample of optical cord to be submitted with meter - 2nos.(each) Optical cord to be demonstrated for mechanical fixing & downloading. 	29.08.2018, 14:00 Hrs
5	Performance guarantee quality system report	<ul style="list-style-type: none"> As per RFQ 	Only for successful bidders.
6	Opening of technical bid	<ul style="list-style-type: none"> As per RFQ 	29.08.2018, 14:30 Hrs

This is a two part bid process. Bidders are to submit the bids a) Technical Bid b) Price Bid.

Both these parts should be furnished in separate sealed covers superscribing specification no. validity etc, with particulars as **Part-I Technical Particulars & Commercial Terms & Conditions** and Tender Fees and **Part-II "Financial bid"** and these sealed envelopes should again be placed in another sealed cover which shall be submitted before the due date & time specified.

Bidders are requested to submit the techno-commercial bid in one Original plus one copy in duplicate.

The Part - I Eligibility and Technical Bid should not contain any cost information whatsoever.

In case of Bids where the qualification requirements, technical suitability and other requirements are found to be inadequate, Part-II "Financial Bid" will be returned unopened.

The Part - II Financial: This envelope will be opened after techno commercial evaluation and only of the qualified bidders. The date and time of same shall be intimated in due course to the qualified bidders. Prices strictly in the format enclosed in Annexure III indicating break up of basic prices, taxes duties, freight etc.

Notwithstanding anything stated above, the Purchaser reserves the right to assess bidders capability to perform the contract, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

Reverse Auction Clause : Purchaser reserves the right to use the online reverse auction as optional tool through SAP - SRM as an integral part of the entire tendering process. All the bidders who are techno-commercially qualified on the basis of tender requirements shall participate in reverse auction. Notwithstanding anything stated above, the Purchaser reserves the right to assess bidder's capability to perform the contract, should the circumstances warrant such assessment in the overall interest of the purchaser. In this regard the decision of the purchaser is final.

4.00 Award Decision

4.01 The purchaser 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 any reason.

4.02 Splitting of tendered quantity in two or more bidders:

BSES reserves the right to split the tender quantity among techno-commercially qualified bidders on account of delivery requirement in tender, quantity under procurement etc.

Splitting of tender quantity amongst more than one bidder shall be governed by below mentioned guidelines:

- a) For the purpose of splitting, the offers of all the bidders whose “Post Reverse Auction prices” are within price consideration zone of 10% above “Post reverse auction L-1 rate” shall be considered eligible.
- b) The tender quantity shall be split in following ratio:
- (i) In case where no bidder falls within price consideration zone of 10% above post RA L-1 rate or more none of the eligible bidders accept the post RA L-1 rate, 100% quantity shall be ordered on post RA L-1 bidder.
 - (ii) If the quantity is to be split among 2 bidders, it will be done in the ratio of 60:40 on L1 price.
 - (iii) If the quantity is to be split among 3 bidders, it will be done in the ratio of 50:30:20 on L1 price.
 - (iv) Any deviation in regards to above will have deviation approval from management.

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

5.00 Market Integrity

We have a fair and competitive marketplace. The rules for bidders are outlined in the Terms & Conditions. Bidders must agree to these rules prior to participating. In addition to other remedies available, we 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 Terms & Condition. Bidders who violate the marketplace rules or engage in behavior that disrupts the fair execution of the marketplace restricts a bidder to length of time, depending upon the seriousness of the violation. Examples of violations include, but are not limited to:

- Failure to honor prices submitted to the marketplace.
- Breach of the terms of the published in Request For Quotation.

6.00 Supplier Confidentiality

All information contained in this RFQ is confidential and may not be disclosed, published or advertised in any manner without written authorization from BYPL. This includes all bidding information submitted.

All RFQ documents remain the property of BYPL and all suppliers are required to return these documents to BYPL upon request.

Suppliers who do not honor these confidentiality provisions will be excluded from participating in future bidding events.

7.0 Contact Information

All communication as regards this RFQ shall be made (i) in English, (ii) in writing and (iii) sent by mail, facsimile to

	Technical	Commercial
Contact Name	Ashwani Aggarwal	Rakesh Bansal
Address	3 rd Floor, B Block, Shakti Kiran Building, Karkardooma, Delhi-32	3 rd Floor, A Block, Shakti Kiran Building, Karkardooma, Delhi-32
Fax No.	011-39999636	011-39999230
Email Id	Ashwani.Aggarwal@relianceada.com	Rakesh.Bansal@relianceada.com

Note:- Those who are downloading tender notice from website. It is advisable to inform BYPL Technical, so as they can be contacted in case of any amendment in tender or for prebid conference.

SECTION - II
INSTRUCTION TO BIDDERS (ITB)

Single Phase and Three Phase Smart meter with HES Prepaid Engine
and SIM card
NIT : CMC/BY/18-19/RB/VKS/041

Dated : 08.08.2018

A. GENERAL

1.00 BSES YAMUNA POWER LIMITED, hereinafter referred to as the Purchaser “are desirous of implementing the various System Improvement/Repair & Maintenance works at their respective licensed area in Delhi. The Purchaser has now floated this tender for procurement Single Phase and Three Phase Smart meter with HES Prepaid Engine and SIM cards as notified earlier in this bid document.

2.00 SCOPE OF WORK

The scope shall include Design, Manufacture, Testing at works conforming to the Technical Specifications enclosed along with Packing, Forwarding, Freight and Unloading and proper stacking at Purchaser’s stores.

3.0 DISCLAIMER

3.01 This Document includes statements, which reflect various assumptions, which may or may not be correct. Each Bidder/Bidding Consortium should conduct its own estimation and analysis and should check the accuracy, reliability and completeness of the information in this Document and obtain independent advice from appropriate sources in their own interest.

3.02 Neither Purchaser nor its employees will have any liability whatsoever to any Bidder or any other person under the law or contract, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage whatsoever which may arise from or be incurred or suffered in connection with anything contained in this Document, any matter deemed to form part of this Document, provision of Services and any other information supplied by or on behalf of Purchaser or its employees, or otherwise arising in anyway from the selection process for the Supply.

3.03 Though adequate care has been taken while issuing the Bid document, the Bidder should satisfy itself that Documents are complete in all respects. Intimation of any discrepancy shall be given to this office immediately.

3.04 This Document and the information contained herein are Strictly Confidential and are for the use of only the person(s) to whom it is issued. It may not be copied or distributed by the recipient to third parties (other than in confidence to the recipient’s professional advisors).

4.0 COST OF BIDDING

The Bidder shall bear all cost associated with the preparation and submission of its Bid and Purchaser will in no case be responsible or liable for those costs. **Further the Purchaser has a right to get Sample Meter’s tested by any reputed Independent Lab like CPRI/ERDA/NABL at the cost of bidder.**

B. BIDDING DOCUMENTS

5.0 BIDDING DOCUMENTS

5.01 The Scope of Work, Bidding Procedures and Contract Terms are described in the Bidding Documents. In addition to the covering letter accompanying Bidding Documents, the Bidding Documents include:

Volume -I

- a) Request for Quotation (RFQ) - Section – I
- b) Instructions to Bidders (ITB) - Section – II
- c) General conditions of Contract - Section –III

- d) Quantity and delivery requirement - Section -IV
- e) Technical Specifications (TS) - Section -V
- f) Formats - Section -VI

Volume - II

- a) Bid Form - Annexure -I
- b) Bank Gurrantee Format - Annexure -II
- c) Reverse Auction Event - Annexure -III
- d) Price Format - Annexure -IV
- e) Commercial Terms & Conditions - Annexure-V
- f) No Deviation Sheet- Annexure- VI
- g) Self Declaration Form Annexure- VII
- h) Qualification Criterion- Annexure- VIII

5.02 The Bidder is expected to examine the Bidding Documents, including all Instructions, Forms, Terms and Specifications. Failure to furnish all information required by the Bidding documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect will may result in the rejection of the Bid.

6.0 AMENDMENT OF BIDDING DOCUMENTS

6.01 At any time prior to the deadline for submission of Bids, the Purchaser may for any reasons, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by Amendment.

6.02 The Amendment shall be part of the Bidding Documents, pursuant to Clause 5.01, and it will be notified in writing by Fax/e-mail to all the Bidders who have received the Bidding Documents and confirmed their participation to Bid, and will be binding on them .

6.03 In order to afford prospective Bidders reasonable time in which to take the Amendment into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of Bids.

C. PREPARATION OF BIDS**7.0 LANGUAGE OF BID**

The Bid prepared by the Bidder, and all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser, 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.

8.0 DOCUMENTS COMPRISING THE BID

The Bid prepared and submitted by the Bidder shall comprise the following components:

- (a) Bid Form ,Price & other Schedules (STRICTLY AS PER FORMAT)and Technical Data Sheets completed in accordance with Clause 9.0, 10.0, 11.0 and Technical Specification ;
- (b) All the Bids must be accompanied with the required EMD as mentioned in the Section-I against each tender.
- (c) Power of Attorney indicating that the person(s) signing the Bid have the authority to sign the Bid and thus that the Bid is binding upon the Bidder during the full period of its validity, in accordance with clause 12.0.

9.0 BID FORM

9.01 The Bidder shall complete an "Original" and another one "Copy" of the Bid Form and the appropriate Price & Other Schedules and Technical Data Sheets.

9.02 EMD

Pursuant to Clause 8.0(b) above,the bidder shall furnish,as part of its bid, a EMD amounting to 1% of the total bid value (FOR Destination) i.e ₹ 5,31,000/- .The EMD is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture.

The EMD shall be denominated in the currency of the bid,and shall be in the following form :

- (a) A bank guarantee issued by any scheduled bank strictly as per the form at enclosed and shall be valid for a period of thirty (30)days beyond the validity of the bid

Unsuccessful bidders' EMD will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity.

The successful bidder's EMD will be discharged upon furnishing the performance security.The EMD may be forfeited :

- (a) if the Bidder:
 - i) withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form ; or
- (b) in the case of a successful Bidder, if the Bidder fails:
 - (i) to sign the Contract,or
 - (ii) to furnish the required performance security.

10.0 BID PRICES

10.01 Bidders shall quote for the entire Scope of Supply with a break-up of prices for individual items.The total Bid Price shall also cover all the Supplier's obligations mentioned in or reasonably to be inferred from the Bidding Documents in respect of Design, Supply,Transportation to site,all in accordance with the requirement of Bidding Documents The Bidder shall complete the appropriate Price Schedules included herein , stating the Unit Price for each item & total Price.

10.02 The prices offered shall be inclusive of all costs as well as Duties,Taxes and Levies paid or payable during execution of the supply work , breakup of price constituents, should be there.

Prices quoted by the Bidder shall be – Firm “and not subject to any price adjustment during the performance of the Contract. A Bid submitted with an adjustable price quotation will be treated as non -responsive and rejected.

11.0 BID CURRENCIES

Prices shall be quoted **in Indian Rupees Only.**

12.0 PERIOD OF VALIDITY OF BIDS

12.01 Bids shall remain valid for 120 days post bid date.

12.02 Notwithstanding Clause 12.01 above, the Purchaser may solicit the Bidder’s consent to an extension of the Period of Bid Validity. The request and the responses thereto shall be made in writing by Fax/e-mail.

13.0 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 of Clause 22.03 & 22.04 regarding the rejection of Bids, which are not substantially responsive to the requirements of the Bidding Documents.

14.0 FORMAT AND SIGNING OF BID

14.01 The original Bid Form and accompanying documents (as specified in Clause 9.0, clearly marked "Original Bid", plus one copy must be received by the Purchaser at the date, time and place specified pursuant to Clauses 15.0 and 16.0. In the event of any discrepancy between the original and the copies, the original shall govern.

14.02 The original and copy of the Bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to sign on behalf of the Bidder. Such authorization shall be indicated by written Power-of-Attorney accompanying the Bid.

14.03 The Bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D. SUBMISSION OF BIDS

15.0 SEALING AND MARKING OF BIDS

15.01 Bid submission: One original & one Copy (hard copies) of all the Bid Documents shall be sealed and submitted to the Purchaser before the closing time for submission of the bid.

15.02 The Technical Documents and the EMD shall be enclosed in a sealed envelope and the said envelope shall be superscribed with – Technical & EMD “. The Financial bid shall be inside another sealed envelope with superscription – Financial Bid “. Both these envelopes shall be sealed inside another big envelope. All the envelopes should bear the Name and Address of the Bidder and marking for the Original and Copy. The envelopes should be superscribed with – “**Tender Notice No, Due date of submission, Tender opening date.**

15.03 The Bidder has the option of sending the Bids in person. Bids submitted by Telex/Telegram /Fax will not be accepted. No request from any Bidder to the Purchaser to collect the proposals from Airlines/Cargo Agents etc shall be entertained by the Purchaser.

15.04 The Bidder, along with the bid documents has to **submit four samples along with detailed GTP & Drawings**. The sample should clearly indicate (i) Name of the bidder (ii) TenderNo.,(iii) Group & Item Sr.No.etc. Samples will be submitted at BYPL Meter Testing Laboratory, Savita vihar New Delhi or before the due date of tender submission. **Bidders are required to submit the receipt of sample submission along with the technical bid**. The samples shall not be returned back to the bidder. Sample submission is not applicable for existing vendor and for vendor who has supplied meter in the past 6 months (unless supplier wants to it)

16.0 DEADLINE FOR SUBMISSION OF BIDS

16.01 The original Bid, together with the required copies, must be received by the Purchaser at the address specified not **later than 14:00 Hrs on 29.08.2018**.

16.02 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with Clause 9.0, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended

17.0 ONE BID PER BIDDER

Each Bidder shall submit only one Bid either by itself, or as a partner in a Joint Venture. A Bidder who submits or participates in more than one Bid will cause all those Bids to be rejected.

18.0 LATE BIDS

Any Bid received by the Purchaser after the deadline for submission of Bids prescribed by the Purchaser, pursuant to Clause 16.0, will be declared "Late" and rejected and returned unopened to the Bidder.

19.0 MODIFICATIONS AND WITHDRAWAL OF BIDS

19.01 The Bidder is not allowed to modify or withdraw its Bid after the Bid's submission.

E. EVALUATION OF BID

20.0 PROCESS TO BE CONFIDENTIAL

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

21.0 CLARIFICATION OF BIDS

To assist in the examination, evaluation and comparison of Bids, the Purchaser may, at its discretion, ask the bidder for a clarification of its Bid. 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.

22.0 PRELIMINARY EXAMINATION OF BIDS / RESPONSIVENESS

22.01 Purchaser 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.

22.02 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.

22.03 Prior to the detailed evaluation, Purchaser 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.

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

23.0 EVALUATION AND COMPARISON OF BIDS

23.01 The evaluation of Bids shall be done based on the delivered cost competitiveness basis.

23.02 The evaluation of the Bids shall be a stage-wise procedure. The following stages are identified for evaluation purposes: In the first stage, the Bids would be subjected to a responsiveness check. The Technical Proposals and the Conditional ties of the Bidders would be evaluated.

Subsequently, the Financial Proposals along with Supplementary Financial Proposals, if any, of Bidders with Techno-commercially Acceptable Bids shall be considered for final evaluation.

23.03 The Purchaser's evaluation of a Bid will take into account, in addition to the Bid price, the following factors, in the manner and to the extent indicated in this Clause:

(a) Supply Schedule

(b) Deviations from Bidding Documents

Bidders shall base their Bid price on the terms and conditions specified in the Bidding Documents.

The cost of all quantifiable deviations and omissions from the specification, terms and conditions specified in Bidding Documents shall be evaluated. The Purchaser will make its own assessment of the cost of any deviation for the purpose of ensuring fair comparison of Bids.

23.04 Any adjustments in price, which result from the above procedures, shall be added for the purposes of comparative evaluation only to arrive at an "Evaluated Bid Price". Bid Prices quoted by Bidders shall remain unaltered.

F. AWARD OF CONTRACT

24.0 CONTACTING THE PURCHASER

24.01 From the time of Bid submission to the time of contract award, if any Bidder wishes to contact the Purchaser on any matter related to the Bid, it should do so in writing.

24.02 Any effort by a Bidder to influence the Purchaser and/or in the Purchaser's decisions in respect of Bid evaluation, Bid comparison or Contract Award, will result in the rejection of the Bidder's Bid.

25.0 THE PURCHASER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

The Purchaser reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at anytime prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Purchaser's action.

26.0 AWARD OF CONTRACT

The Purchaser will award the Contract to the successful Bidder whose Bid has been Determined to be the lowest-evaluated responsive Bid, provided further that the Bidder has been determined to be qualified to satisfactorily perform the Contract. Purchaser reserves the right to award order other bidders in the tender, provided it is required for progress of project & provided he agrees to come to the lowest rate.

27.0 THE PURCHASER 'S RIGHT TO VARY QUANTITIES

The Purchaser reserves the right to vary the quantity i.e.increase or decrease the numbers/quantities without any change in terms and conditions during the execution of the Order.

28.0 LETTER OF INTENT/ NOTIFICATION OF AWARD

The letter of intent/ Notification of Award shall be issued to the successful Bidder whose bids have been considered responsive, techno-commercially acceptable and evaluated to be the lowest (L1). The successful Bidder shall be required to furnish a letter of acceptance within 7 days of issue of the letter of intent /Notification of Award by Purchaser.

29.0 PERFORMANCE BANK GUARANTEE

The successful Bidder shall furnish the Performance Bank Guarantee for an amount of 5% (Five percent) of the Contract Price in accordance with the format provided in Vol -II, Annexure -II of the bidding documents. The Performance Bond shall be valid for a period of Sixty months (60) from the date of the commissioning or Sixty six months (66) from the date of receipt of material (last consignment) at site/stores whichever is earlier plus 3 months towards claim period. Upon submission of the performance security, the EMD shall be released.

30.0 CORRUPT OR FRAUDULENT PRACTICES

30.01 The Purchaser requires that the Bidders observe the highest standard of ethics during the procurement and execution of the Project. In pursuance of this policy, the Purchaser:

(a) Defines, for the purposes of this provision, the terms set forth below as follows:

(i) "Corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and

(ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the Purchaser of the benefits of free and open competition.

(b) Will reject a proposal forward if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(c) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a contract.

30.02 Furthermore, Bidders shall be aware of the provision stated in the General Conditions of Contract.

SECTION - III
(GENERAL CONDITION OF CONTRACT)

Single Phase and Three Phase Smart meter with HES Prepaid Engine
and SIM card
NIT : CMC/BY/18-19/RB/VKS/041

Dated : 08.08.2018

GENERAL TERMS AND CONDITION

1.0 General Instructions

- 1.01 All the Bids shall be prepared and submitted in accordance with these instructions.
- 1.02 Bidder shall bear all costs associated with the preparation and delivery of its Bid, and the Purchaser will in no case shall be responsible or liable for these costs.
- 1.03 The Bid should be submitted by the Bidder in whose name the bid document has been issued and under no circumstances it shall be transferred/sold to the other party.
- 1.04 The Purchaser reserves the right to request for any additional information and also reserves the right to reject the proposal of any Bidder, if in the opinion of the Purchaser, the data in support of RFQ requirement is incomplete.
- 1.05 The Bidder is expected to examine all instructions, forms, terms & conditions and specifications in the Bid Documents. Failure to furnish all information required in the Bid Documents or submission of a Bid not substantially responsive to the Bid Documents in every respect may result in rejection of the Bid. However, the Purchaser's decision in regard to the responsiveness and rejection of bids shall be final and binding without any obligation, financial or otherwise, on the Purchaser.

2.0 Definition Of Terms

- 2.01 "Purchaser" shall mean BSES YAMUNA POWER LIMITED, on whose behalf this bid enquiry is issued by its authorized representative / officers.
- 2.02 "Bidder" shall mean the firm who quotes against this bid enquiry issued by the Purchaser. "Supplier" or "Supplier" shall mean the successful Bidder and/or Bidders whose bid has been accepted by the Purchaser and on whom the "Letter of Acceptance" is placed by the Purchaser and shall include his heirs, legal representatives, successors and permitted assigns wherever the context so admits.
- 2.03 "Supply" and " " shall mean the Scope of Contract as described.
- 2.04 "Specification" shall mean collectively all the terms and stipulations contained in those portions of this bid document known as RFQ, Commercial Terms & Condition, Instructions to Bidders, Technical Specifications and the Amendments, Revisions, Deletions or Additions, as may be made by the Purchaser from time to time.
- 2.05 "Letter of Acceptance" shall mean the official notice issued by the Purchaser notifying the Supplier that his proposal has been accepted and it shall include amendments thereto, if any, issued by the Purchaser. The "Letter of Acceptance" issued by the Purchaser shall be binding on the "Supplier" The date of Letter of Acceptance shall be taken as the effective date of the commencement of contract.
- 2.06 "Month" shall mean the calendar month and "Day" shall mean the calendar day.
- 2.07 "Codes and Standards" shall mean all the applicable codes and standards as indicated in the Specification.
- 2.08 "Offer Sheet" shall mean Bidder's firm offer submitted to BYPL in accordance with the specification.
- 2.09 "Contract" shall mean the "Letter of Acceptance" issued by the Purchaser.

- 2.10 "Contract Price" shall mean the price referred to in the "Letter of Acceptance".
- 2.11 "Contract Period" shall mean the period during which the "Contract" shall be executed as agreed between the Supplier and the Purchaser in the Contract inclusive of extended contract period for reason beyond the control of the Supplier and/or Purchaser due to force majeure.
- 2.12 "Acceptance" shall mean and deemed to include one or more of the following as will be stipulated in the specification:
- a) The written acceptance of material by the inspector at suppliers works to ship the materials.
 - b) Acceptance of material at Purchaser site stores after its receipt and due inspection/ testing and release of material acceptance voucher.
 - c) Where the scope of the contract includes supplyg, acceptance shall mean issue of necessary equipment / material takeover receipt after installation & commissioning and final acceptance.
- 3.0 **Contract Documents & Priority**
- 3.01 Contract Documents: The terms and conditions of the contract shall consist solely of these RFQ conditions and the offer sheet.
- 3.02 Priority: Should there be any discrepancy between any term hereof and any term of the Offer Sheet, the terms of these RFQ shall prevail.
- 4.0 **Scope Of Supply -General**
- 4.01 The "Scope of Supply" shall be on the basis of Bidder's responsibility, completely covering the obligations, responsibility and supplies provided in this Bid enquiry whether implicit or explicit.
- 4.02 Bidder shall have to quote for the Bill of quantities as listed in Section - IV of this RFQ.
- 4.03 Quantity variation and additional requirement if any shall be communicated to successful bidder during project execution.
- 4.04 All relevant drawings, data and instruction manuals.
- 5.0 **Quality Assurance and Inspection**
- 5.01 Immediately on award of contract, the bidder shall prepare detailed quality assurance plan / test procedure identifying the various stages of manufacture, quality checks performed at each stage, raw material inspection and the Customer hold points. The document shall also furnish details of method of checking, inspection and acceptance standards / values and get the approval of Purchaser before proceeding with manufacturing. However, Purchaser shall have right to review the inspection reports, quality checks and results of suppliers in house inspection department which are not Customer hold points and the supplier shall comply with the remarks made by purchaser or his representative on such reviews with regards to further testing, rectification or rejection, etc.
- 5.02 Witness and Hold points are critical steps in manufacturing, inspection and testing where the supplier is obliged to notify the Purchaser in advance so that it may be witnessed by the Purchaser. Final inspection is a mandatory hold point. The supplier to proceed with the work past a hold point only after clearance by purchaser or a witness waiver letter from BYPL.
- 5.03 The performance of waiver of QA activity by Purchaser at any stage of manufacturing does not relieve the supplier of any obligation to perform in accordance with and meet all the requirements of the procurement documents and also all the codes & reference documents mentioned in the procurement document nor shall it preclude subsequent rejection by the purchaser.

- 5.04 On completion of manufacturing the items can be dispatched only after issue of MDCC (Material Dispatch Clearance Certificate) document by the Purchaser.
- 5.05 All testing and inspection shall be done with out any extra cost.
- 5.06 Purchaser reserve the right to send any material out of the supply to any recognized laboratory for testing and the cost of testing shall be borne by the Purchaser. In case the material is found not in order with the technical requirement / specification, the charges along with any other penalty which may be levied is to be borne by the bidder. To avoid any complaint the supplier is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidders representative.
- 5.07 Bidder has to sign quality agreement before supply of the material.

6.0 Packing, Packing List & Marking

- 6.01 **Packing:** Supplier shall pack or shall cause to be packed all Commodities in boxes and containers and otherwise in such a manner as shall be reasonably suitable for shipment by road or rail to BYPL without undue risk of damage in transit.
- 6.02 **Packing List:** The contents of each package shall be itemized on a detailed list showing the exact weight and the extreme outside dimensions (length, width and eight) of each container or box. One copy of the packing list shall be enclosed in each package delivered. There shall also be enclosed in one package a master packing list identifying each individual package, which is part of the shipment. On any packaging where it is not feasible to place the packing list inside the container, all pertinent information shall be stenciled on the outside and will thus constitute a packing list.

7.01 Prices basis for supply of materials

Bidder to quote their prices on Landed Cost Basis and separate price for each items.

For Supply to BYPL Delhi the price shall be inclusive of packing, forwarding, Excise Duty, Sales Taxes, VAT and Freight. **Octroi is presently not applicable in Delhi and however if applicable shall be reimbursed at actuals.**

The above supply prices shall also **include unloading** at site stores.

Transit and storage insurance will be arranged by BYPL, however bidder to furnish required details in advance for arranging the same by BYPL.

Purchaser shall issue Form 'C' and accordingly bidder to consider applicable taxes in the quoted price.

8.0 Variation in taxes, duties & levies:

- 8.01 The total order value shall be adjusted on account of any variations in Statutory Levies imposed by Competent Authorities by way of fresh notification(s) within the stipulated delivery period only. However, incase of reduction in taxes, duties and levies, the benefits of the same shall be passed on to BUYER.
- 8.02 No other Taxes, Duties & Levies other than those specified above will be payable by BUYER except in case of new Levies, Taxes & Duties imposed by the Competent Authorities by way of fresh notification(s) subsequent to the issue of PURCHASE ORDER but within the stipulated delivery period.
- 8.03 Notwithstanding what is stated above, changes in Taxes, Duties & Levies shall apply only to that portion of PURCHASE ORDER not executed on the date of notification by Competent Authority.

Further changes in Taxes, Duties & Levies after due date of Delivery shall not affect PURCHASE ORDER Terms and Value.

8.04 PURCHASE ORDER value shall not be subject to any variation on account of variation in Exchange rate(s).

9.0 **Taxes & Duties on raw materials & bought out components:**

9.01 Taxes & Duties on raw materials & bought out components are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

9.02 Taxes & Duties on raw materials & bought out components procured indigenously are included in Order Value and are not subject to any escalation or variation for any reason whatsoever.

10.0 **Terms of payment and billing**

For Supply of Smart Meters (Part A):

Milestone Number	Milestone Description
MS-1 (Delivery of Smart Meters & Installation and Commissioning of Software)	90% payment of Part-A shall be made within 45 days from the date of receipt of material at store/ site and installation and commissioning of software after submission of 5% performance bank guarantee and following documents against dispatch of each consignment: i. Consignee copy of LR ii. Supplier detailed invoice showing commodity description, quantity, unit price, total price and basis of delivery. iii. Original certificate issued by BSES YAMUNA POWER LTD confirming receipt of material at site and acceptance of the same. iv. Dispatch clearance / inspection report in original issued by the inspection authority v. Packing List. vi. Test Reports vii. Guarantee Certificate.
MS-2 (10% Retention Amount)	10% Retention for Part-A shall be released after 3 months of successful post Installation and Commissioning of Smart Pre Paid meters and software

For Installation of Smart Meters (Part B):

Milestone Number	Milestone Description
MS-1 (Installation and Commissioning of Smart Pre Paid Meters and Supply of SIM)	100% payment shall be made within 45 days (after submission of bills with requisite documents monthly basis) post successful installation and integration of meters and sign off by Engineer In - Charge and submission of following documents : i. Monthly Invoice. ii. Material Reconciliation statement for all issued material from BYPL, (Utilized & Balance) in a specified format duly verified form Engineer In-charge. Any shortfall in material shall be recovered from the bills/reimbursed by you. iii. Meter replacement/Installation Reports/Progress Chart & measurement sheet with relevant documents. If required, measurement sheet shall be uploaded by the Bidder online through BYPL developed software. iv. EBS certificate for New Meters, Old Meters and Seal Reconciliation Certificates obtained from Engineer In-charge. v. Material Issuance, Old Meter Return and Scrap Deposit Dockets. vi. Documents of statutory compliances.

	vii. All required Documents Listed in Appendix-X which may be amended as per instruction of Engineer In-charge BYPL. Payment shall be released after Tax deduction at Source (TDS) as per the prevailing rules & TDS certificates shall be issued to the Bidder.
Part C (Annual Maintenance Cost (AMC))	Payments against AMC shall be made on quarterly basis in arrears.

11.0 Price Validity

11.01 All bids submitted shall remain valid, firm and subject to unconditional acceptance by BYPL Delhi for 120 days post bid-date. For awarded suppliers, the prices shall remain valid and firm till contract completion.

12.0 Performance Guarantee

12.01 Supplier shall establish a performance bond in favor of BSES YAMUNA POWER LIMITED in an amount not less than Five percent (5%) of the total price of the Contract (the "Performance Bond"). The Performance Bond shall be valid for a period of Sixty months (60) from the date of the commissioning or Sixty six months (66) from the date of receipt of material (last consignment) at site/stores which ever is earlier plus 3 months towards claim period. It shall be in accordance with one of the following terms:

- (a) Depositing pay order /demand draft of the relevant amount directly with BYPL at the address listed above or as otherwise specified by BYPL, either of which shall constitute the Performance Bond hereunder; or
- (b) Bank guarantee from any nationalized bank in favour of BSES YAMUNA POWER LIMITED. The performance Bank guarantee shall be in the format as specified by BYPL.

13.0 Forfeiture

13.01 Each Performance Bond established under Clause 10.0 shall contain a statement that it shall be automatically and unconditionally forfeited without recourse and payable against the presentation by BYPL of this Performance Bond to the ICICI Bank at Mumbai, or to the relevant company/ correspondent bank referred to above, as the case may be, together with a simple statement that supplier has failed to comply with any term or condition set forth in the Contract.

13.02 Each Performance Bond established under will be automatically and unconditionally forfeited without recourse if BYPL in its sole discretion determines that supplier has failed to comply with any term or condition set forth in the contract.

14.0 Release

All Performance Bonds will be released without interest within seven (7) days from the last date up to which the Performance Bond has to be kept valid (as defined in Clause 10.0) except for the case set forth in Clause 21.0.

15.0 Defects Liability Period

15.01 The bidder to Guarantee the materials / items supplied against any defect of failure, which arise due to faulty materials, workmanship or design for the entire defects liability period. The Defect liability period shall be 60 months from the date of commissioning or 66 months from the date of delivery whichever is earlier. If during the defects liability period any materials / items are found to be

defective, these shall be replaced or rectified by the bidder at his own cost within 30 days from the date of receipt of intimation.

16.0 Return, Replacement or Substitution.

Purchaser shall give Supplier notice of any defective Commodity promptly after becoming aware thereof. Purchaser may in its discretion elect to return defective Commodities to Supplier for replacement, free of charge to BYPL, or may reject such Commodities and purchase the same or similar Commodities from any third party. In the latter case BYPL shall furnish proof to Supplier of the cost of such substitute purchase. In either case, all costs of any replacement, substitution, shipping, labour and other related expenses incurred in connection with the return and replacement or for the substitute purchase of a Commodity hereunder should be for the account of Supplier. BYPL may set off such costs against any amounts payable by BYPL to Supplier. Supplier shall reimburse BYPL for the amount, if any, by which the price of a substitute Commodity exceeds the price for such Commodity as quoted in the Bid.

17.0 Effective Date of Commencement of Contract:

17.01 The date of the issue of the Letter of Acceptance shall be treated as the effective date of the commencement of Contract.

18.0 Time - The Essence Of Contract

18.01 The time and the date of completion of the "Supply" as stipulated in the Letter Of Acceptance / Purchase order issued to the Supplier shall be deemed to be the essence of the "Contract". The Supply has to be completed not later than the aforesaid Schedule and date of completion of supply .

19.0 The Laws and Jurisdiction of Contract:

19.01 The laws applicable to this Contract shall be the Laws in force in India.

19.02 All disputes arising in connection with the present Contract shall be settled amicably by mutual consultation failing which shall be finally settled as per the rules of Arbitration and Conciliation Act, 1996 at the discretion of Purchaser. The venue of arbitration shall be at Mumbai in India

20.0 Events of Default

20.01 Events of Default. Each of the following events or occurrences shall constitute an event of default ("Event of Default") under the Contract:

- (a) Supplier fails or refuses to pay any amounts due under the Contract;
- (b) Supplier fails or refuses to deliver Commodities conforming to this RFQ/ specifications, or fails to deliver Commodities within the period specified in P.O. or any extension thereof
- (c) Supplier becomes insolvent or unable to pay its debts when due, or commits any act of bankruptcy, such as filing any petition in any bankruptcy, winding-up or reorganization proceeding, or acknowledges in writing its insolvency or inability to pay its debts; or the Supplier's creditors file any petition relating to bankruptcy of Supplier;
- (d) Supplier otherwise fails or refuses to perform or observe any term or condition of the Contract and such failure is not remediable or, if remediable, continues for a period of 30 days after receipt by the Supplier of notice of such failure from BYPL.

21.0 Consequences of Default.

- (a) If an Event of Default shall occur and be continuing, BYPL may forthwith terminate the Contract by written notice.

(b) In the event of an Event of Default, BYPL may, without prejudice to any other right granted to it by law, or the Contract, take any or all of the following actions;

- (i) present for payment to the relevant bank the Performance Bond;
- (ii) purchase the same or similar Commodities from any third party; and/or
- (iii) recover any losses and/or additional expenses BYPL may incur as a result of Supplier's default.

22.0 Penalty for Delay

22.01 If supply of items / equipments is delayed beyond the supply schedule as stipulated in purchase order then the Supplier shall be liable to pay to the Purchaser as penalty for delay, a sum of 0.5% (half percent) of the contract price (Ex-work price) for every week delay or part thereof for individual mile stone deliveries.

22.02 The total amount of penalty for delay under the contract will be subject to a maximum of ten percent (10%) of the contract price (Ex-work price)

22.03 The Purchaser may, without prejudice to any method of recovery, deduct the amount for such damages from any amount due or which may become due to the Supplier or from the Performance Bond or file a claim against the supplier.

23.0 Force Majeure

23.01 General

An "Event of Force Majeure" shall mean any event or circumstance not within the reasonable control directly or indirectly, of the Party affected, but only if and to the extent that:

- (i) Such event or circumstance materially and adversely affects the ability of the affected Party to perform its obligations under this Contract, and the affected Party has taken all reasonable precautions, due care and reasonable alternative measures in order to prevent or avoid the effect of such event on the affected party's ability to perform its obligations under this Contract and to mitigate the consequences thereof.
- (ii) For the avoidance of doubt, if such event or circumstance would not have materially and adversely affected the performance of the affected party had such affected party followed good industry practice, such event or circumstance shall not constitute force majeure.
- (iii) Such event is not the direct or indirect result of the failure of such Party to perform any of its obligations under this Contract.
- (iv) Such Party has given the other Party prompt notice describing such events, the effect thereof and the actions being taken in order to comply with above clause.

23.02 Specific Events of Force Majeure subject to the provisions of above clause, Events of Force Majeure shall include only the following to the extent that they or their consequences satisfy the above requirements :

- (i) The following events and circumstances :
 - a) Effect of any natural element or other acts of God, including but not limited to storm, flood, earthquake, lightning, cyclone, landslides or other natural disasters.

b) Explosions or fires

(ii) War declared by the Government of India, provided that the ports at Mumbai are declared as a war zone.

(iii) Dangers of navigation, perils of the sea.

23.03 Notice of Events of Force Majeure If a force majeure event prevents a party from performing any obligations under the Contract in part or in full, that party shall:

i) Immediately notify the other party in writing of the force majeure events within 7(seven) working days of the occurrence of the force majeure event

ii) Be entitled to suspend performance of the obligation under the Contract which is affected by force majeure event for the duration of the force majeure event.

iii) Use all reasonable efforts to resume full performance of the obligation as soon as practicable

iv) Keep the other party informed of all such efforts to resume full performance of the obligation on a regular basis.

v) Provide prompt notice of the resumption of full performance or obligation to the other party.

23.04 Mitigation of Events of Force Majeure Each Party shall:

(i) Make all reasonable efforts to prevent and reduce to a minimum and mitigate the effect of any delay occasioned by an Event of Force Majeure including recourse to alternate methods of satisfying its obligations under the Contract;

(ii) Use its best efforts to ensure resumption of normal performance after the termination of any Event of Force Majeure and shall perform its obligations to the maximum extent practicable as agreed between the Parties; and

(iii) Keep the other Party informed at regular intervals of the circumstances concerning the event of Force Majeure, with best estimates as to its likely continuation and what measures or contingency planning it is taking to mitigate and or terminate the Event of Force Majeure.

23.05 Burden of Proof In the event that the Parties are unable in good faith to agree that a Force Majeure event has occurred to an affected party, the parties shall resolve their dispute in accordance with the provisions of this Agreement. The burden of proof as to whether or not a force majeure event has occurred shall be upon the party claiming that the force majeure event has occurred and that it is the affected party.

23.06 Termination for Certain Events of Force Majeure. If any obligation of any Party under the Contract is or is reasonably expected to be delayed or prevented by a Force Majeure event for a continuous period of more than 3 months, the Parties shall promptly discuss in good faith how to proceed with a view to reaching a solution on mutually agreed basis. If a solution on mutually agreed basis cannot be arrived at within a period of 30 days after the expiry of the period of three months, the Contract shall be terminated after the said period of 30 days and neither Party shall be liable to the other for any consequences arising on account of such termination.

23.07 Limitation of Force Majeure event. The Supplier shall not be relieved of any obligation under the Contract solely because cost of performance is increased, whether as a consequence of adverse economic consequences or otherwise.

23.08 Extension of Contract Period due to Force Majeure event The Contract period may be extended by mutual agreement of Parties by way of an adjustment on account of any period during which an obligation of either Party is suspended due to a Force Majeure event.

23.09 Effect of Events of Force Majeure. Except as otherwise provided herein or may further be agreed between the Parties, either Party shall be excused from performance and neither Party shall be construed to be in default in respect of any obligations hereunder, for so long as failure to perform such obligations shall be due to and event of Force Majeure."

24.0 Transfer And Sub-Letting

24.01 The Supplier shall not sublet, transfer, assign or otherwise part with the Contract or any part thereof, either directly or indirectly, without prior written permission of the Purchaser.

25.0 Recoveries

25.01 When ever under this contract any money is recoverable from and payable by the bidder, the purchaser shall be entitled to recover such sum by appropriating in part or in whole by detecting any sum due to which any time thereafter may become due from the supplier in this or any other contract. Should the sum be not sufficient to cover the full amount recoverable the bidder shall pay to the purchaser on demand the remaining balance.

26.0 Waiver

26.01 Failure to enforce any condition herein contained shall not operate as a waiver of the condition itself or any subsequent breach thereof.

27.0 Indemnification

27.01 Notwithstanding contrary to anything contained in this RFQ, Supplier shall at his costs and risks make good any loss or damage to the property of the Purchaser and/or the other Supplier engaged by the Purchaser and/or the employees of the Purchaser and/or employees of the other Supplier engaged by the Purchaser whatsoever arising out of the negligence of the Supplier while performing the obligations under this contract.

SECTION - IV: QUANTITY AND DELIVERY REQUIREMENT

S.no	Material Description	Specification	Requirement		
			Total Qty	Delivery Schedule	Location
	BYPL				
1	MTR,ENERGY,10-60A,1PH,SMART PREPAID	Section V	10000	Within 2 month from the date of ordering/LOI	Stores BYPL Delhi
2	SUPPLY OF IPH SMART METER BOX		10000		
3	MTR,ENERGY,20-80AMP,3PH, SMART PREPAID		2000		
4	SUPPLY OF 3PH SMART METER BOX		2000		
5	HES Prepaid Engine/ MDAS software		1		
6	SIM card		12000		

SECTION - V
TECHNICAL SPECIFICATION (TS)

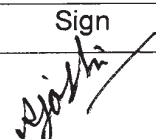

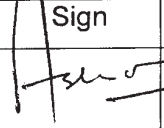
Single Phase and Three Phase Smart meter with HES Prepaid Engine
and SIM card

NIT : CMC/BY/18-19/RB/VKS/041

Dated : 08.08.2018

Technical Specification For Single Phase Smart Meter

Specification for
Single Phase Smart meter
Specification no – SP-SPWCSM-117-R0

Prepared by		Reviewed by		Approved by		Rev	Date
Name	Sign	Name	Sign	Name	Sign		
AJ		GS		AA		0	25/04/2018

Technical Specification For Single Phase Smart Meter**Index**

Record of Revision	3
1.0 Scope of Supply	4
2.0 Codes & standards	4
3.0 Service Conditions.....	6
4.0 Distribution System Data	6
5.0 Electrical and Accuracy Requirement.....	6
6.0 Construction	7
7.0 Functional Requirement	11
8.0 Meter Display.....	17
9.0 Data and communication protocol/ HES/Integrations/ Software	18
10.0 Name Plate.....	19
11.0 Component Specification.....	20
12.0 Quality Assurance, Inspection and Testing	21
13.0 Packing, Marking, Shipping, Handling and Storage.....	23
14.0 Deviations.....	24
15.0 Drawing Submission.....	24
16.0 Delivery	25
Annexure- A- Guaranteed Technical Particulars	25
Annexure - B- Recommended Accessories / Spares	25
Annexure - C- Integration Requirement of Meters with NIC and HES	26
Annexure- D- Tamper and Fraud Detection Events	27
Annexure -E- Meter Enclosure	30

Technical Specification For Single Phase Smart Meter

Record of Revision

Item/Clause No.	Change in Specification	Reason of change	Approved By	Rev

Technical Specification For Single Phase Smart Meter

1.0 Scope of Supply

This specification covers the following for Single Phase 240 V, 10A-60 A Static Watt hour smart meters of accuracy class 1.0 with plug in communication modules suitable for RF / cellular technology and integrated load control switches.

- A. Design, manufacture, testing at manufacturer works before dispatch, packing, delivery and submission of all documentation.
- B. Any accessories / hardware required for installation and operation for the meter.

2.0 Codes & standards

Materials, equipment and methods used in the manufacturing of above mentioned equipment shall conform to the latest edition/ of following		
SL	Standard Number	Title
2.1	Indian Electricity Act	IE Act 2003
2.2	CEA Metering Regulations	With latest amendments
2.3	CBIP Manual (Pub no.-325)	Standardization of AC Static Electrical Energy Meters
2.4	IS- 16444 (Part 1)	AC Static Transformer Operated Watt-hour Smart Meters, Class 1.0 and 2.0 Part 1 Specification
2.5	IS- 13779	AC Static Watt-hour Meters, Class 1 and 2 – Specification
2.6	IS-15959 (Part 1)	Data Exchange for Electricity Meter - Reading Tariff and Load Control - Companion Specification
2.7	IS-15959 (Part 2)	Data Exchange for Electricity Meter - Reading Tariff and Load Control (Part 2)- Companion Specification for smart meter
2.8	IS- 11448	Application guide for AC Electricity meters
2.9	IEC- 62052-11	Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 11: Metering equipment
2.10	IEC- 62053-21	Electricity metering equipment (A.C) - Particular requirements - Part 21: Static meters for active energy (classes 1 and 2)
2.11	IEC- 62053-52	Electricity metering equipment (AC) - Particular requirements - Part 52: Symbols
2.12	IEC 62053-61	Electricity metering equipment (A.C.) - Particular requirements - Part 61: Power consumption and voltage requirements
2.13	IEC 62058-11	Electricity metering equipment (AC) - Acceptance inspection - Part 11: General acceptance inspection methods
2.14	IEC 62058-31	Electricity metering equipment (AC) - Acceptance inspection - Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)
2.15	IEC 60736	Testing Equipment for electrical Energy meter
2.16	IS/IEC/TR 62051:Part 1:2004	Electricity Metering — Data Exchange For Meter Reading, Tariff And Load control — Glossary Of Terms Part 1 Terms Related To Data Exchange With metering Equipment Using DLMS/ COSEM

Technical Specification For Single Phase Smart Meter

2.17	IEC 62056-1-0:2014	Smart metering standardisation framework
2.18	IEC 62056-3-1:2013	Use of local area networks on twisted pair with carrier signalling
2.19	IEC 62056-4-7:2014	DLMS/COSEM transport layer for IP networks
2.20	IEC 62056-5-3:2017	DLMS/COSEM application layer
2.21	IEC 62056-6-1:2017	Object Identification System (OBIS)
2.22	IEC 62056-6-2:2017	COSEM interface classes
2.23	IEC 62056-6-9:2016	Mapping between the Common Information Model message profiles (IEC 61968-9) and DLMS/COSEM (IEC 62056) data models and protocols
2.24	IEC 62056-7-3:2017	Wired and wireless M-Bus communication profiles for local and neighbourhood networks
2.25	IEC 62056-7-5:2016	Local data transmission profiles for Local Networks (LN)
2.26	IEC 62056-7-6:2013	The 3-layer, connection-oriented HDLC based communication profile
2.27	IEC TS 62056-8-20:2016	Mesh communication profile for neighbourhood networks
2.28	IEC TS 62056-9-1:2016	Communication profile using web-services to access a DLMS/COSEM server via a COSEM Access Service (CAS)
2.29	IEC 62056-9-7:2013	Communication profile for TCP-UDP/IP networks
2.30	IEC 62056-21:2002	Direct local data exchange
2.31	DLMS- White Book	Glossary of DLMS/COSEM terms
2.32	DLMS- Blue Book	COSEM meter object model and the object identification system
2.33	DLMS- Green Book	Architecture and protocols to transport the model
2.34	DLMS- Yellow Book	Conformance testing process
2.35	IEEE 802.15.4	Standard for Local and metropolitan area networks.
2.36	IEEE 802.15.4u	Standard for Local and metropolitan area networks (Use of the 865 MHz to 867 MHz Band in India)
Order of precedence between different standards shall be as follow:		
i	Indian Standards Issued By BIS	
ii	IEC standard	
iii	Other standards like CBIP, DLMS etc.	

Technical Specification For Single Phase Smart Meter

3.0 Service Conditions

3.1	Temperature Range	Operation range: -10 Deg C to 55 Deg C Limit range of operation: -25 to 60 Deg C Limit range of storage / transport : -25 to 70 Deg C
3.2	Relative Humidity	0 to 96 %

4.0 Distribution System Data

4.1	Supply	1 Phase AC, 2 wire
4.2	Voltage	240 V \pm 6%
4.3	Frequency	50 Hz \pm 5%
4.4	System Neutral	Solidly Earthed

5.0 Electrical and Accuracy Requirement

5.1	Meter Type	Meter Type 1: 1- \emptyset , 2 wire Static Watt-hour Smart Meter Meter Type 2: 1- \emptyset , 2 wires Static Watt-hour Smart Meter fitted in polycarbonate box. Meter Type 1/ Type 2 shall be offered as per purchaser's requisition/ BOQ.
5.2	Connection	Direct / whole current
5.3	Rated Voltage	240V (phase to neutral) with variation of +30% & -40%. However meter should withstand the maximum system voltage.
5.4	Rated Current	Ib -10A and I _{max} - 60 A
5.5	Starting current	0.2 % of base current
5.6	Rated Frequency	50Hz +/- 5%
5.7	Accuracy Class	1.0 for Kwh, kVARH and kVAH (IS13779 applies for accuracy requirements)
5.8	Power Consumption	As per IS 16444 (Part 1) Meter with lowest power consumption shall be preferred.
5.9	Meter constant	Imp/ unit (Bidder to specify meter constant)
5.10	Calibration	Meter shall be software calibrated at factory and modification in calibration shall not be possible at site by any means or external influence.
5.11	Insulation Level	Meter shall withstand an insulation test of 4 KV and impulse test at 8 KV
5.12	Influence of supply voltage	As per clause 4.4.2 of IS 15884
5.13	Short time over current	As per clause no. 4.4.3 of IS 15884
5.14	Immunity to phase and earth fault	As per clause no. 9.6 of IS 13779
5.15	Influence of Self Heating	As per IS 4.4.4 of IS 15884
5.16	Influence of Heating	As per IS 4.4.5 of IS 15884

Technical Specification For Single Phase Smart Meter

5.17	Electromagnetic compatibility	<ul style="list-style-type: none"> a. Meter along with (NIC) shall remain immune to electrostatic discharge (upto and including 35KV), electromagnetic HF field and fast transient burst along-with NIC. b. The meter shall be designed in such a way that conducted or radiated electromagnetic disturbances as well as electrostatic discharge do not influence the meter. c. Meter shall be type tested for electromagnetic compatibility. d. Meter shall comply requirement of clause no. 4.5 and 5.5 of IS 15884.
5.18	Limits of error due to influence quantities	<p>Meter shall work within guaranteed accuracy as per IS 13779/ IEC62053-21/ CBIP325 (most stringent standard to be followed) under and after influence of following :-</p> <ul style="list-style-type: none"> a. Current Variation b. Ambient Temperature variation c. Voltage variation d. Frequency variation e. 10% third harmonic in current f. Reversed phase sequence g. Voltage unbalance h. Harmonic components in current and voltage circuit i. DC and even harmonics in AC current circuit j. Odd harmonics in AC current circuit k. Sub harmonics in AC current circuit l. Continuous (DC) "stray" magnetic induction of 67mT+/-5%. m. Continuous (DC) "abnormal" magnetic induction of 0.27T+/-5%. n. Alternating (AC) "stray" magnetic induction of 0.5mT+/-5% o. Alternating (AC) "abnormal" magnetic induction of 10mT. p. External magnetic field 0.5 T q. Electromagnetic HF fields r. Radio frequency interference s. DC immunity test <p>Note: BYPL reserves the right to formulate any other test method to check magnetic immunity/ logging of meter. Meter with logging provision will be preferred.</p>

6.0 Construction

6.1	General	Construction of meters shall confirm to the IS 16444 (Part 1)
6.2	Base Body	Material - Opaque and UV stabilized polycarbonate of grade LEXAN 143/ 943 or Equivalent with V0 inflammability level.
6.3	Top Cover	<ul style="list-style-type: none"> a. Material – Transparent/Opaque and UV stabilized polycarbonate of grade LEXAN 143/ 943 or Equivalent with V0 inflammability level. b. Top cover and base should be Ultrasonically/Chemically welded. c. Mechanism shall be provided to log event in case of top cover is opened. Bidder shall explain its mechanism.
6.4	Terminal Block	a. Material - Flame retardant glass filled polycarbonate of grade 500 R or equivalent.

Technical Specification For Single Phase Smart Meter

		<ul style="list-style-type: none"> b. Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135 Deg C and pressure of 1.8MPa. The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
6.5	Terminal cover	<ul style="list-style-type: none"> a. Meter Type 1: The terminal cover shall be extended type with 2 no's holes of minimum 30 mm in diameter for cable entry. Meter Type 2: Short terminal cover with U cut suitable for entry of 2CX25 Sqmm Cable. b. Material - UV stabilized transparent/Opaque polycarbonate cover. c. Provision of sealing through sealing screws. d. The sealing screws shall be held captive in the terminal cover. e. Terminal cover should have provision for cable entry from bottom. f. Baffle wall shall be provided above the cable entry base wall so that access to the terminals is not possible (even with thin metallic wire) without breaking the seal. g. Diagram of external connections should be embossed on terminal cover. Sticker is not acceptable. h. Mechanism shall be provided to record an event with occurrence and restoration in case of terminal cover is opened. Bidder shall explain its mechanism.
6.6	Terminals	<ul style="list-style-type: none"> a. Terminals shall be suitable upto 25 Sqmm aluminium stranded cable. b. Two no's flat head screws and washers per terminal shall be provided c. Material of terminals, screws and washers should be brass or tinned copper. Terminals shall be tested for continuous current of 150 % I_{max}. d. Terminals shall be clearly marked for phase / neutral / outgoing etc. e. Clearances and creep age shall be as per IS 13779.
6.7	Ingress Protection	IP 51 or better, but without suction in the meter.
6.8	Test Output device	Meter should have flashing LED visible from the front to represent energy recording. Resolution shall be such that satisfactory accuracy test can be conducted at the lowest load in less than 5 minutes and starting current test in less than 10 minutes.
6.9	RTC	<ul style="list-style-type: none"> a. The meter shall have internal real time crystal clock to set date and time. b. Drift in time of this clock shall not be more than ±5minutes/year at a reference temperature of 27°C. c. Meter should have capability of Time synchronization. d. Meter RTC shall be corrected automatically by the system in synchronization to the network RTC. e. HES will sync RTC at least once a day.
6.9.1	Time keeping	As per IS 15884
6.10	Battery	Lithium ion battery with guaranteed shelf life of 10 years and capacity life of 15 years. Lithium thioyl Chloride battery will be preferred. In case battery removal or total discharge same should not affect the working & memory of the meter even in case of single wire power condition.

Technical Specification For Single Phase Smart Meter

6.11	Memory	Non volatile memory independent of battery backup, memory should be retained up to 10 year without any auxiliary power.
6.12	Self Diagnostic feature	Meter shall have self diagnostic for the following <ul style="list-style-type: none"> a. Date and RTC. b. Battery. c. Non volatile memory. d. Display e. Communication card status
6.13	Load Control Switch	<ul style="list-style-type: none"> a. Smart meter shall be equipped with integrated load control switches to control flow of electricity to the load at the instance of connect/ disconnect commands as per functional need of the system. b. Load switch for connect/ disconnect purpose shall be mounted inside the meter with suitable arrangement. c. Load Switches shall be provided in both phase and neutral d. The rating of switches used shall be in line with meter rating.
6.13.1	Performance requirement for load switching	<ul style="list-style-type: none"> a. Utilization category of the load switch shall be UC2 as per clause no. 4.6.6.2 of IS 15884. b. All load switches shall operate simultaneously.
6.14	Optical port	Meter shall have an optical port with a rust resistance coated metal ring to hold magnet of downloading probe. Optical port shall comply with hardware specifications provided in IEC-62056-21.
6.15	Communication Module Interface	<ul style="list-style-type: none"> a. Meter should have the provision for 01 no's plug in communication module for connectivity. The same interface shall be compatible with both Cellular and RF communication technologies interchangeable in field. b. Interface shall support data transfer between meter and network interface card over UART/ RS232. Bidder shall explain its pin out and standard in detail. c. Meter shall have mechanism to log communication module removal as an event in its memory with date and time stamp. d. Meter Vendor shall work with BYPL designated RF provider to integrate their module in the meter as per integration requirement mentioned in annexure 'C'. e. Preferred location of communication card module shall be on top of meter.
6.15.1	Communication modules (NIC)	<ul style="list-style-type: none"> a. Smart meter shall have 01 no's plug-in type communication modules/ Network Interface card (NIC) for connectivity of meter to HES from following options as per tender requirement: <ul style="list-style-type: none"> i. Communication Module/ NIC Type 1: RF based suitable for communication Network of BYPL designated RF canopy provider. ii. Communication Module/ NIC Type 2: LTE 4G with 3G and 2G fall back as per Indian telecom Standards. iii. Communication Module/ NIC Type 3: RF and cellular communication module (LTE 4G with 3G and 2G fall back as per Indian telecom Standards). b. Meter shall have separate indications on display/ for remote and local communication.

Technical Specification For Single Phase Smart Meter

		<ul style="list-style-type: none"> c. Communication module shall held in a casing which can be directly plugged in the meter. Sealing screw shall be provided. d. Communication module/ NIC shall be purchased from BYPL designated RF provider.
6.16	Last Gasp	Meter shall have provisions to provides last gasp signals through communication module in case of power failure. Bidder should explain in detail the provisions provided in meter to achieve the requirement.
6.17	Meter Sealing Arrangement	<ul style="list-style-type: none"> a. Sealing should be in accordance with IS and CEA metering regulations with latest amendments. b. Sealing arrangement shall be such that sealed parts shall not be opened without breaking the seal or sealed part itself. There should be clear evidence of the breaking in case sealed parts shall be opened without breaking the seal. c. Approval shall be taken from purchaser for location of seals and number of seals.
6.17.1	Manufacturer's Seals	<ul style="list-style-type: none"> a. One Polycarbonate seal to be provided on meter cover. b. Minimum one seal as Hologram type, numbered with hologram transfer on tamper proof paper seal. Seal should not be just Hologram sticker (100% hologram).
6.17.2	BYPL Seals	<ul style="list-style-type: none"> a. Minimum one seal as Hologram type, numbered with hologram transfer on tamper proof paper seal. Seal should not be just Hologram sticker (100% hologram). Meter sides should not have sharp edges to avoid damage to hologram seals. b. Minimum one Polycarbonate seal should be provided on top cover. c. Minimum 01 no's polycarbonate seals shall be provided for communication module. d. Seals will be issued to manufacturer free of cost.
6.17.3	Seal record	Record of all seals shall be forwarded to purchaser with each lot.
6.18	Name Plate and marking	<ul style="list-style-type: none"> a. Meter should have clearly visible, indelible and distinctly marked name plate in accordance with IS 16444 (Part 1) & clause no. 9.0 of this specification. b. All markings and details shall be printed by laser only. c. Paper stickers are not allowed for name plate.
6.19	Resistance against heat and fire	The terminal block and Meter case shall have 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.
6.20	Meter Box	As per Annexure 'E' if required in purchaser's requisition. Meter shall be factory fitted in meter enclosure by unidirectional screws.
6.21	Guarantee	<ul style="list-style-type: none"> a. 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier b. Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

Technical Specification For Single Phase Smart Meter

7.0 Functional Requirement

7.1	Meter category	Smart meter comply with D1 category of IS 15959 (Part 2).
7.2	Mode of metering	<p>It should be possible to configure meters in following modes of metering:</p> <ul style="list-style-type: none"> a. Forwarded Only: In this mode any export active energy shall be treated as import energy and shall be recorded in forward only register. Apparent energy calculation shall be as per KVAH calculation mentioned in clause '7.4' b. Bidirectional: Both Import and export energy recording shall be applicable in this mode of metering and relevant registers shall be updated. <p>Any change in metering mode shall be logged in events with date and time stamp. Default mode of metering shall be forwarded only until specified otherwise.</p>
7.3	Payment Mode	<p>It should be possible to configure meter in following modes of payment:</p> <ul style="list-style-type: none"> a. Post payment mode b. Prepayment Mode <p>Any change in payment mode shall be logged in events with date and time stamp. Prepayment facility shall be achieved by server / HES. Default mode of metering shall be post payment until specified otherwise.</p>
7.4	KVAH Calculation	Lag only: KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh < KWh.
7.5	MD calculation	Block window with default demand integration period of 1800 s configurable to 900 s as per requirement. Extended register shall be used for MD recording.
7.6	TOU Metering	<ul style="list-style-type: none"> a. Meter shall be capable of doing TOD metering in minimum 4 tariff rate registers programmable for minimum 8 time zones and 4 seasonal profiles. b. TOU metering shall be implemented by the activity calendar method of IS 15959 Part 1 clause 9/ DLMS UA-1000-1/ IEC c. Special Day table shall be defined as per DLMS UA-1000-1/ IEC d. Default TOU programming shall be as per latest DERC guidelines. Prior approval shall also be taken from BYPL for the same. e. Tariff rate registers shall be as follow R1: Rate register for Peak R2: Rate register for Normal R3: Rate Register for Off Peak
7.7	Instantaneous Parameters	<p>All the parameters mentioned in table 'A1' of IS 15959 (Part 2) along with following additional parameters shall be supported by meter:</p> <ul style="list-style-type: none"> a. RF/ GSM signal Strength in milli db. b. Displacement PF. c. GPS coordinates.

Technical Specification For Single Phase Smart Meter

		<ul style="list-style-type: none"> d. Temperature in Deg C. e. kVARH f. kVAH
7.7.1	Association rights	As per clause 11.1.1 of IS 15959 (Part 2).
7.8	Billing data	<ul style="list-style-type: none"> a. Billing parameters shall be generated at the end of each billing cycle and stored in memory as per provisions provided in clause no. 14 of IS 15959 (Part 2). b. 6 no's billing cycle parameters shall be remain in meter memory along with current cycle parameters and shall be available for reading as well as profile and or 'by entry' for selective access. c. All the parameters mentioned in table 'A4' of IS 15959 (Part 2) shall be supported by meter.
7.8.1	Association Rights	As per clause 14 of IS 15959 (Part 2).
7.8.2	Selective access	Support for selective access shall be provided for billing parameters as per clause no 11.3 of IS 15959 (part 1).
7.8.3	Billing period reset/ MD reset	00:00 Hrs of 1st of every month
7.8.4	Billing period reset mechanism	As per clause 10 of IS 15959 (Part 1)
7.8.5	Billing period counter	Cumulative billing period counter since installation and available billing periods shall be provided as per clause 11.2 of IS 15959 (Part 1).
7.9	Load survey Parameters	<ul style="list-style-type: none"> a. Load survey parameters shall be measured and recorded at the end of each profile capture period for last 35 Power ON days. b. All the parameters mentioned in table 'A15' of IS 15959 (Part 2) shall be supported by meter.
7.9.1	Association Rights	As per clause no. of IS 15959 (Part 2)
7.9.2	Selective Access	Support for selective access shall be provided for billing parameters as per clause no 11.3 of IS 15959 (part 1).
7.9.3	Profile capture period	Default 1800 s programmable to 900 s.
7.10	Daily load profile	Daily load profile parameters shall be measured and recorded at each midnight i.e. 00:00 hrs for last 35 Power ON days. All the parameters mentioned in table 'A16' of IS 15959 (Part 2) shall be supported by meter as Daily load profile parameters:
7.11	General Purpose Parameters	Following parameters shall be provided in Non Volatile memory (NVM) of the meter as per clause 16 of IS 15959 (Part 2).
7.11.1	Name Plate Detail	As per Table 'A26' of IS 15959 (Part 2) with following additional parameters. <ul style="list-style-type: none"> a. Month of manufacturing.
7.11.1.1	Association rights	As per clause 22.1 of IS 15959 (Part 2).
7.11.2	Programmable parameters	<ul style="list-style-type: none"> a. These parameters can be programmed remotely by HES and locally by CMRI via proper access writes. Every transaction shall be logged in non volatile memory of the meter with date and time stamp. b. Programming of any of the parameters shall increment the 'Cumulative programmable count' value. c. All the parameters mentioned in table Table 'A27' of IS 15959 (Part 2) shall be supported by meters.

Technical Specification For Single Phase Smart Meter

7.11.2.1	Association rights	As per clause 22.2 of IS 15959 (part 2)
7.11.3	Push Services	<ul style="list-style-type: none"> a. Smart meter is able to automatically notify data, event, and messages to a destination client system in an unsolicited manner (without a request from a client) as per clause no 6 of IS 15959 (Part 2). b. Randomization: Data from different endpoints shall be pushed intelligently on the network in order to avoid excessive traffic on the network for example in case all the endpoints will push load survey data simultaneously, then it may result in network choking or inefficient performance. Therefore with the help of intelligent techniques such field scenarios shall be handled effectively. c. It shall also be possible to configure push services for all profiles i.e instantaneous, billing, load survey, daily energy and events. Bidder should explain its capability to configure push services. However following push services shall be available by default. <ul style="list-style-type: none"> i. Load survey profile data at after every 4 hours configurable to any predefined interval. ii. Mid night data at 00:00 hrs of every day. iii. Billing profile data on occurrence of billing.
7.11.3.1	Periodic push (Smart meter to HES)	<ul style="list-style-type: none"> a. Meter shall be able to push instantaneous parameters to HES at predefined intervals. Parameters required for push shall be intimated during detailed engineering in the vent of order. b. Other attributes as per IS 15959 (Part 2) i.e. Send Destination, Communication window, Randomization time interval, number of retries and repeat delay shall be decided in the event of manufacturing.
7.11.3.2	Event Push (Smart meter to HES)	<ul style="list-style-type: none"> a. Meter is able to report HES, the status change of any of the identified events mapped in to event status word (ESW) of size 128 bits by pushing following objects to HES. <ul style="list-style-type: none"> i. Device ID ii. Push Setup ID iii. Real time clock- Date and Time iv. Event Status Word 1 (ESW 1). b. Each of the bits in ESW shall reflect the current state of the event and are mapped against each of the identified events. c. An event status word filter (ESWF) of 128 bit shall also be provided to configure events for event push. Events which are supported in meter shall only be configured for event push. Bit value 1 in ESWF shall indicate that the event is supported and value 0 indicates that event is not supported for event push. Position of the event bit in ESWF shall be same as in ESW.
7.11.3.3	Event status Bit mapping	As Per IS 15959 (Part 2)

Technical Specification For Single Phase Smart Meter

7.12	Firmware upgrade	<ul style="list-style-type: none"> a. Smart meter shall support remote firmware upgrade feature for meter firmware without loss of any data and metrology for a part or complete firmware of meter. b. Firmware upgrade shall use the Image transfer classes and mechanisms specified in IEC62056-6-2 and IEC62056-5-3. c. Broad cast facility shall be supported in HES for simultaneously upgrading the firmware of a group of meters installed in field. d. Firmware upgrade feature shall be provided with proper security. The design shall take into account field scenarios such as power failure during F/W upgrade. e. Once the firmware is upgraded, meter shall send an acknowledgment to HES. It shall also log it as an event in its memory. f. Meter shall support capability to self register the meter with new firmware. g. The execution time of the change of the firmware within the meter should be below 1 minute
7.13	Support for broadcast message	<p>Meter shall support connection less messaging services of DLMS to support broadcast messages for a group of meters for following actions:</p> <ul style="list-style-type: none"> a. Gap reconciliations. b. Firmware upgrade. c. On demand readings. d. Meter connection and disconnection. e. Updating of Programmable parameters.
7.14	Disconnection mechanism	<ul style="list-style-type: none"> a. The Smart meter shall support disconnection (all the switches shall operate simultaneous) on the following conditions as per clause 11 of IS 16444 (Part 1): <ul style="list-style-type: none"> i. Over current (105 % of I_{max} in any element for predefined persistence time.) ii. Load control limit (Programmable) iii. Pre-programmed tamper conditions (Factory programmed) iv. Disconnection signal from Head end system. v. Pre paid function for prepayment mode. b. Meter shall use the disconnection control object as defined in clause 10 of IS 15959 (Part 2). c. Load limit function shall be disabled by default until other specified.

Technical Specification For Single Phase Smart Meter

7.15	Local reconnection Mechanism	<ul style="list-style-type: none"> a. Meter shall be able to reconnect load switches locally only for Overload and load control limit disconnections. b. The meter will try to reconnect the load up to predefined time, with predefined interval (Time and interval is programmable). c. If the consumption is still more than the programmed limits, it will lock out and wait for 30 minutes. d. If the consumption is still above the limit, the procedure defined above in 1 and 2 shall be repeated. e. It shall be possible to remotely connect/disconnect the relay via commands from HES. The remote reconnect shall not interrupt the normal connect/disconnect cycle. f. In case of relay malfunction i.e., connect/disconnect action of relay is not taking place due to welding of contacts or any other reason, then it shall be logged as an event in the Non-rollover compartment. Same shall be sent as an alert to HES. g. Remote command shall have priority over local communication.
7.16	Reconnection mechanism	<ul style="list-style-type: none"> a. Reconnection shall be done from HES except for over current and load control limit. In case of failure of communication / HES, reconnection shall be possible through Hand Held Device (CMRI) locally via proper security. b. Reconnection in case of prepayment meter shall be as per prepayment profile.
7.17	Status of load switch	<ul style="list-style-type: none"> a. Indication of status of relay i.e. connected/disconnected should be available on display as well as through communication to HES. b. Connection and disconnection should be logged as events.
7.18	First breath and last gasp	<ul style="list-style-type: none"> a. Status indication of switch i.e. connected/disconnected should be available on display as well as through communication to HES. b. In Last Gasp endpoint shall send the power outage notification with Time Stamp. In case of power failure meter communication module shall not draw power from the backup battery. c. For the purpose of sending the Last Gasp, meter shall have proper power backup (like a super capacitor).
7.19	Security	Advanced security outlined in clause 7.1.2 of IS 15959 (Part 1) shall be provided.
7.19.1	Encryption for data communication	As per clause 7.1 of IS 15959 (Part 2)
7.19.2	Encryption/ Authentication for data transport	As per clause 7.2 of IS 15959 (Part 2)
7.19.3	Key requirement and handling	As per clause 7.3 of IS 15959 (Part 2)

Technical Specification For Single Phase Smart Meter

7.19.4	NIC security	<ul style="list-style-type: none"> a. Proper security at end points as well as network level shall be present to prevent unauthorized hacking of the end points or the network itself. b. The meter password is required to open a session between NIC and meter and is required to gain clearance from the meter to perform requested operation. c. If clearance not gains, the meter locks out communication for 1 minute. The meter maintain counter for monitoring of unsuccessful attempts of performing meter operations and alerts to HES. The counter is incremented each time a password clearance operation fails. d. Up to 3 no's successful attempts are allowed, after which the port is locked out until authenticated from system administrator.
7.20	IP communication profile support	Meter shall support TCP-UDP/ IP communication profile for smart meter to HES. Please refer clause 8 of IS 15959.
7.21	Connection/ Tamper Conditions	<p>The meter shall continue to record forward energy under any one or combinations of the following conditions:</p> <ul style="list-style-type: none"> a. I/C & O/G Interchanged b. Phase & Neutral Interchanged c. I/C Neutral Disconnected, O/G Neutral & Load Connected To Earth. d. I/C Neutral Disconnected, O/G Neutral Connected To Earth Through Resistor & Load Connected To Earth. e. I/C Neutral connected, O/G Neutral Connected to Earth through Resistor & Load Connected to Earth. f. I/C (Phase & Neutral) Interchanged, Load Connected To Earth. g. I/C & O/G (Phase or Neutral) Disconnected, Load Connected To Earth. <p>During bidirectional mode for condition mentioned at sl no. 'a' meter shall record in export registers</p>
7.22	Event and tamper detection	Meter shall detect and log any exceptional/ fraud/ tamper conditions in its memory as an event. In addition to this all transactions and control shall also be recorded as an event in meter memory. Each event type shall be identified by an event ID.
7.22.1	Association Rights	<p>Each event shall be available to download as per following association rights.</p> <ul style="list-style-type: none"> i. Public Client: No access ii. Meter Reader: Read only iii. utility Settings: Read only iv. Push Services: Read Only for identified events as per ESWF

Technical Specification For Single Phase Smart Meter

7.22.2	Compartments of events	Meter shall be able to log events in following compartments <ul style="list-style-type: none"> a. Voltage Related Events b. Current Related Events c. Power Related Events d. Others Events e. Non Roll Over Events f. Transaction related events g. Control Events
		Occurrence and Restoration of Voltage Related, current related, power related and other events shall be logged in meter memory as per IS 15959 (Part 2). Please refer annexure 'A' for description of events, Event ID, Logics of events and threshold values of events.
		Threshold values shall be factory programmable.
		Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).
		For each of the events a certain list of parameters shall be captured as per clause 'a'
		For each occurrence event captured, the cumulative tamper count shall be incremented.
		Only Real clock (date and time) and event code shall be captured events in compartments mentioned at sl no. 'd', 'f', 'g', 'h'.
7.22.3	Parameter Snapshot	Captured parameters mentioned above are to be captured when event occurrence and restoration is logged as per IS 15959 (Part 2). <ul style="list-style-type: none"> a. Date and time of event b. Event code c. Active Current d. Voltage e. Power factor f. Cumulative energy- kWh, kVAh, kVARh
		Captured parameters are to be captured at the time of logging of event occurrence and restoration
7.22.4	Event Logging	The meter shall log minimum 100 tamper events (ensuring at least 20 events for each tamper).
7.22.5	Tamper Indication	Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.

8.0 Meter Display

8.1	LCD Type	STN Liquid crystal with backlit
8.2	Viewing angle	Minimum 160 Degree.
		The display visibility should be sufficient to read the Meter mounted at height of 0.5 m as well as at the height of 2 m.
8.3	Size of LCD	Minimum 10 mm X 6 mm
8.4	LCD Digits	Total 6 +1 digits
8.5	LCD language	English

Technical Specification For Single Phase Smart Meter

8.6	Display mode	Following parameters should be displayed in Auto scroll with programmable interval		
		Order	Parameter	Display time
		1	LCD Test	5 Sec
		2	Meter Sr. No.(8 digits)	5 Sec
		3	Date	5 Sec
		4	Time	5 Sec
		5	Cumulative kWh	30 Sec
		6	Current month MD	5 Sec
		7	Instantaneous Voltage	5 Sec
		8	Instantaneous Current	5 Sec
		9	Power Factor	5 Sec
		10	Frequency	5 Sec
		11	Instantaneous Load KW	5 Sec
		12	Signal Strength (RF/ GSM)	5 Sec
		13	Temperature	5 Sec
		14	kVARh	5 Sec
15	kVAH	5 Sec		
Meter with push button for manual display shall not be acceptable.				
8.7	Display indications	Appropriate indications/flags for all tampers and self diagnostic features should be provided.		

9.0 Data and communication protocol/ HES/Integrations/ Software

9.1	Data Exchange protocol	<ul style="list-style-type: none"> a. Meter should comply Indian companion of data exchange and tariff control specification IS 15959 (Part 2). b. In case of additional requirement from IS 15959 (part 2), they shall be as per DLMS standards/ IEC DLMS protocols suite (62056). c. Bidder shall explain in detail the additional parameters/ services/ methods used in meters from IS 15959 (part 2) and its reference to DLMS books/ IEC. d. Prior to manufacturing of meters bidder shall provide a detailed specification explaining all parameters/ services/ methods used in meter in addition to IS 15959 (Part 2).
9.2	Integration with HES	<ul style="list-style-type: none"> a. Bidder shall work with BYPL IT team/ BYPL designated system integrator to integrate its meter with BYPL HES system as per integration requirements mentioned in annexure 'C'. b. Bidder shall prepare detailed documents as mentioned in above clause and submit it for BYPL approval and integration with HES.
9.3	Base computer software	Licensed Software with the following features should be supplied for free to download meter through optical port.
9.3.1	Operating System	BCS should be compatible for latest Windows operating system.

Technical Specification For Single Phase Smart Meter

9.3.2	Security	System shall be password protected where user can login only if login ID is provided by administrator. BCS shall have rights management system so that access rights can be provided as per requirement to maintain security.
9.3.3	Database	BCS shall maintain master database according to desired area, location, and region etc.
9.3.4	Reporting	<ul style="list-style-type: none"> a. BCS shall have option of user defined report generation in format of Excel, Word and CSV, XML, PDF etc. b. BCS shall have capability to export data in ASCII, CSV and XML format at desired location so that the same could be integrated with our billing data for processing. c. All the data available in the meter shall be convertible to user defined ASCII, CSV and XML file format.
9.3.5	Data transfer rate	BCS and communication ports should support data transfer rate of 9600 bps (minimum).
9.4	Hand Held Unit Software	<ul style="list-style-type: none"> a. The manufacturer has to provide software capable of downloading all the data stored in meter memory through window/ android operating system based handheld units (HHU) through optical port. b. In the event of order, bidder shall work with BYPL IT team/ BYPL designated system integrator to develop HHU software for meter downloading and further uploading on HES. c. HHU software should have option for selection of parameters to be downloaded from meter. d. Meter data consisting of all parameters and complete load survey for all parameters shall be read by HHU and downloaded on HES in minimum possible time (not more than 5 minutes).
9.5	Training	Manufacture shall impart training to BYPL personnel for usage of software and installation.

10.0 Name Plate

10.1	Meter Serial number shall be of 8 digits. Serial number shall be printed in black colour. Embossing is not acceptable.
10.2	Size of the digit shall be minimum 5X3mm
10.3	Bar code shall be printed along with serial number
10.4	BIS registration mark (ISI mark)
10.5	'BYPL' insignia shall be printed above LCD display.
10.6	BYPL PO No. & date
10.7	Manufacturers name and country of origin
10.8	Model type / number of meter
10.9	Year of manufacturing
10.10	Reference voltage / current rating
10.11	The number of phases and the number of wires for which the meter is suitable. Graphical symbol as per IS 12032 can be used.
10.12	Meter constant
10.13	Class index of meter
10.14	Reference frequency
10.15	Warranty period
10.16	Symbol of load switch

Technical Specification For Single Phase Smart Meter

10.17	<p>Name plate of NIC</p> <ol style="list-style-type: none"> a. Serial no of NIC along/ IMEI no/MAC address with bar code b. Name of purchaser's c. Communication technology with carrier frequency d. Manufacturing year and month. e. Warranty period.
-------	--

11.0 Component Specification

11.1	Current Transformers	The Meters should be with the current transformers as measuring elements.	The current transformer should withstand for the clauses under 4.18(t)
11.2	Shunt element	Data sheet should be submitted.	Reputed
11.3	Measurement or computing chips	The Measurement or computing chips used in the Meter should be with the Surface mount type along with the ASICs.	Analog Devices, Cyrus Logic, Atmel, Phillips, SAMES ,NEC,TEXAS
11.4	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	Atmel, National Semiconductors, Texas Instruments, Phillips, ST, Hitachi, Compiled
11.5	Display modules	<ol style="list-style-type: none"> a) The display modules should be well protected from the external UV radiations. b) The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). c) It should be STN type industrial grade with extended temperature range min 70 °C. 	Truly semiconductor, Tianma / Haijing Electronics, China, Hitachi,
11.6	Optical port	The mechanical construction of the port should facilitate the data transfer. Communication shall not disturbed by external light.	Everlight, Osram, Agillent, NFC
11.7	Power Supply	The power supply should be with the capabilities as per the relevant standards. The power supply unit of the meter should not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
11.8	Electronic components	<p>The active & passive components should be of the surface mount type & are to be handled & soldered by the state of art assembly processes.</p> <p>The PTH components should be positioned such a way that the leads of components should not be under stress and not touching the internal wires.</p>	National Semiconductors, Atmel, Phillips, Texas Instruments. Hitachi, Compiled, AVX or Ricoh Samsung, EPCOS, Vishay
		LED	Everlight, Agillent

Technical Specification For Single Phase Smart Meter

11.9	Mechanical parts	a) The internal electrical components should be of electrolytic copper & should be protected from corrosion, rust etc. b) The other mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods.	
11.10	Battery	Lithium with guaranteed life of 15 years	Texcell, SAFT, Varta
11.11	RTC & Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	Philips, Dallas Atmel, Motorola, Microchip, TEXAS, NEC or Compiled
11.12	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm	(BBT test is must)
11.13	Load Switch	Utilization Category UC2/ UC3 Latching relay Can withstand 120% of Vref and 120% of I _{max} current. As per IS 15884	Gruner/ KG/ any other reputed make subject to BYPL approval.
11.14	Note	a. The components used by manufacturer shall have "Minimum Life" more than the 10 years. b. In case vendor want to use other make components; same shall be approved by BYPL before use. c. Even for existing supplier – fresh approval is needed for all deviations. d. Manufacturer should have complete tracking of material used in meter. BYPL reserve the right to carry out audit of inventory/ manufacturing process at manufacturer's works and sub vendor's work.	

12.0 Quality Assurance, Inspection and Testing

12.1	Vendor's Quality Plan (QP)	To be submitted for Purchaser's approval.
12.2	Sampling Method	Sampling Method for quality checks shall be as per relevant IS/ IEC/ CBIP guidelines and Purchaser's prior approval shall be taken for the same.
12.3	Inspection Hold- Points	To be mutually identified, agreed and approved in Quality Plan.
12.4	Type Tests	a. The meter shall be of type tested quality including all tests specified in this specification which are beyond IS / IEC or CBIP. b. Type test conducted from CPRI/ ERDA/ or any other lab specified by BIS/ CEA for smart meter testing will be treated as valid. c. Type test certificate should be submitted along with offer for scrutiny. d. Any other component supplied in addition to meter shall also be type tested as per IS /IEC if applicable. e. Complete type test as per IS 16444 (Part 1) shall be carried out on sample selected from BYPL lot.
12.5	Routine tests	All test marked "R" as per table 20 of IS 13779.

Technical Specification For Single Phase Smart Meter

12.6	Acceptance Tests	<ul style="list-style-type: none"> a. All tests marked "A" as per table 20 of IS 13779. b. Smart meter functional tests as per IS 16444 Table 1 c. Test of load switch as per clause 10.4 of IS 16444 (Part 1) d. Test for data exchange protocol as per clause 10.5 of IS 16444. e. Test for Smart meter communicability as per clause no. 10.6 of IS 16444 (Part 1). f. All the routine and acceptance tests shall be carried out as per relevant standards. g. Following tests in addition to IS shall be conducted during lot inspection. <ul style="list-style-type: none"> I) Dimensional and drawing verification. II) Display parameters/ sequence. III) Data Downloading from CMRI and PC. IV) Tamper/ fraud detection/logging features as per approved Documents. Tamper conditions will be simulated at varying load up to I_{max}. Accuracy will also be checked during tamper simulation. V) Burn in chamber test. VI) Component verifications. h. Purchaser reserves the right to formulate any other test method to verify guaranteed parameters of Meter.
12.7	ESD and Magnetic Interference test	ESD and magnetic interference test will be conducted at Samir lab, Chennai or CPRI.
12.8	Inspection	<ul style="list-style-type: none"> a. Purchaser reserves the right to inspect /witness all tests on the meters at Seller's works at any time, prior to dispatch, to verify compliance with the specification/ standards. b. Manufacturer should have all the facilities/ equipments to conduct all the acceptance tests as per relevant standards/ this specification and tampers logics as per approved GTP. All the equipments including tamper logs kits/ jigs should be calibrated. c. In-process and / or final inspection call intimation shall be given in advance to purchaser.

Technical Specification For Single Phase Smart Meter

13.0 Packing, Marking, Shipping, Handling and Storage

13.1	Packing	<ul style="list-style-type: none"> a. Each meter must be packed, together with its terminal cover, in a separate environmental friendly cardboard box, which can be opened and re-closed without needing adhesives. b. Up to 10 single-phase meters in case of meter type 1 and 5 no's meters with enclosure in case of meter type 2 must be packed together with their terminal covers in a group cardboard box, which can be opened and re-closed without needing adhesives. c. The box shall prevent, as much as possible, penetration of dust during long storage periods. The box must be designed for multiple use and be robust, with wall thickness of at least 4 mm. d. Maximum weight of a group meter box shall not be more than 25 Kg. e. The packaging will protect the meters against shock and vibration, preventing damage due to the road conditions during transport and distribution in the field. The electrical and mechanical properties shall not be affected by these disturbances. f. For shipping the boxed meters will be close packed by stockpiles of suitable quantities on pallets. The meters numbers sequence (without partition) shall be kept in each pallet. A pallet will be protected against moisture by a polyethylene hood, covered with a cardboard cover (hood), and fixed onto the pallet by parallel polypropylene bands, using protection angle bars at the corners. The hood shall be marked – on the front (wide side), on the narrow side and on the top as per clause 13.3. g. Each pallet should contain between 70 and 300 meters. The actual number of meters on each pallet will be agreed with the BYPL in the event of order. h. An impact detector ("Shock-Watch") label shall be attached to the cardboard hood of several pallets in each container/ transport truck, to warn of possible rough handling during shipment, transport and storage.
13.2	Packing for accessories and spares	Robust non returnable packing case with all the above protection & identification Label.
13.3	Marking	<p>On each group box and pallet, following details are required both on front (wide side) and top:</p> <ul style="list-style-type: none"> a. BYPL logo. b. Meter serial number range along with bar code. c. Unique number of box/ pallet. d. Purchaser's name e. PO number (along with SAP item code, if any) & date with bar code f. Equipment Tag no. (if any) g. Destination h. Manufacturer / Supplier's name i. Address of Manufacturer / Supplier / it's agent j. Type , rating and other description of equipment k. Country of origin l. Month & year of Manufacturing

Technical Specification For Single Phase Smart Meter

		<ul style="list-style-type: none"> m. Case measurements n. Gross and net weights in kilograms o. All necessary slinging and stacking instructions
13.4	Test reports	Routine test report to be provided with each meter
13.5	Shipping	The seller shall be responsible for all transit damage due to improper packing.
13.6	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet /manual to be furnished before commencement of supply.

14.0 Deviations

14.1	Deviations	<ul style="list-style-type: none"> a. Deviations from this specification can be acceptable, only where the Seller has listed in his quotation the requirements he cannot, or does not, wish to comply with and which deviations the Buyer has agreed to in writing, before any order is placed. b. In the absence of any list of deviations from the Seller, it will be assumed by the Buyer that the Seller complies with the Specification fully.
------	------------	---

15.0 Drawing Submission

Drawing submission shall be as per the matrix given below. All documents/ drawing shall be provided on A4 sheet in box file with separators for each section. Language of the documents shall be English only. Deficient/ improper document/ drawing submission may liable for rejection

SL	Detail of Document	Bid	Approval	Pre Dispatch
1	Guaranteed Technical particulars (GTP)	Required	Required	
2	Deviation Sheet, if any	Required	Required	
3	Tamper Sheet	Required	Required	
4	Display Parameters	Required	Required	
5	GA / cross sectional drawing of Meter showing all the views / sections	Required	Required	
6	Detail of network interface i.e. pin out, standard, voltage level etc and its integration requirement.	Required	Required	
7	Samples of each type and rating offered along with box and RF NIC/ communication module of already integrated RF card as per tender qualifying criteria.	4 no's (2 no's without box and 2 no with box)	2 no's (1 no's without box and 1 no with box)	
8	Any software and accessories required for installation/ operation of meter	Required	Required	
9	Manufacturer's quality assurance plan and certification for quality standards	Required		
10	Type Test reports of offered model/ type/ rating	Required		
11	BIS certificate	Required		
12	Complete product catalogue and user manual.	Required		
13	Customer Reference List	Required		
14	Recommended list of spare and accessories	Required		

Technical Specification For Single Phase Smart Meter

15	Specification documents containing all parameters, Services, Methods in addition to companion specification of IS 15959 (part 2).		Required	
16	Program for production and testing (A)		Required	Required
17	Makes of components		Required	Required
18	Detailed installation and commissioning instructions		Required	Required
19	As Built Drawing		Required	Required
20	Operation and maintenance Instruction as well as trouble shooting charts/ manuals		Required	Required
21	Inspection and test reports, carried out in manufacturer's works			Required
22	Routine Test certificates			Required
23	Test certificates of all bought out items			Required
24	Meter Seal data			Required
25	Mapping of meter serial no to Communication card.			Required

16.0 Delivery

16.1	Delivery	Despatch of Material: Vendor shall despatch the material, only after the Routine Tests/Final Acceptance Tests (FAT) of the material witnessed/waived by the Purchaser, and after receiving written Material Despatch Clearance (MDC) from the Purchaser.
------	----------	--

Annexure- A- Guaranteed Technical Particulars

Bidder shall furnish the GTP format with all details against each clause of this specification.
 Bidder shall not change the format of GTP or clause description.
 Bidder to submit duly filled GTP in hard copy format with company seal.

Clause No.	Clause Description	Manufacturer's Reply
1		
2		
3		
4		
5		

Bidder / Vendor seal / signature -----

Name of the bidder	
Address of the bidder	
Name of contact person	
Telephone number and email id	

Annexure - B- Recommended Accessories / Spares

SL	Description of spare part	Unit	Quantity
1		No	
2		No	

Technical Specification For Single Phase Smart Meter**Annexure - C- Integration Requirement of Meters with NIC and HES**

Integration requirements with communication provider of BYPL/ any other agency designated by BYPL for other components of AMI.

- a. Bidder(s) must share the meter security keys, all level encryption, and password information along with asset information in a format with the buyer / communication provider of BYPL so that during AMI business flow, the device and data can be authenticated all the time.
- b. Bidder(s) must share the details of meter communication specifically programmed protocols.
- c. Bidder(s) must share the meter configuration source code to the BYPL/ communication provider of BYPL.
- d. Bidder (s) must share the meter interface touch points for external applications/ systems.
- e. Bidder(s) must share the required APIs including but not limited to reading APIs, configuration APIs and Functional APIs with the System Integrator for execution of business flow (Installation, reading, configuration).
- f. Bidder(s) must share the data storage and retrieval details.
- g. Bidder(s) must configure the devices to be upgraded remotely (OTA) and share the required firmware source code (with updates over the project life) with system integrator as and when it is required in case of feature request or fault correction.
- h. Bidder(s) must follow and conduct Utility's sample and periodic test program, including (but not limited to) the selection of a sample population of meters, sharing of sample test results as reported by the meter testing systems with the system Integrator.
- i. Bidder(s) must share the information related to communication module for the authorization purpose at to BYPL/ communication provider of BYPL.

Technical Specification For Single Phase Smart Meter

Annexure- D- Tamper and Fraud Detection Events

1. Voltage Related Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Over Voltage (occurrence/ restoration)	Meter should log high voltage event if voltage in any phase is above a threshold value. Threshold value is factory programmable.	Occurrence: If $V_{pn} > 110\% V_{ref}$ Restoration: If $V_{pn} \leq 110\% V_{ref}$	Occurrence: 5 Min Restoration: 5 Min
Low Voltage (occurrence/ Restoration)	Meter should log low voltage event if voltage in any phase is below a threshold value. Threshold value is factory programmable.	Occurrence: If $V_{pn} < 75\% V_{ref}$ Restoration: If $V_{pn} \geq 75\% V_{ref}$	Occurrence: 5 Min Restoration: 5 Min
2. Current Related Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Reverse Power/ reverse current	Meter should log the event of power reverse if meter detect power flow from outgoing to incoming terminals.	Occurrence: If $I_p = -ve$ direction Restoration: If $I_p = +ve$ direction	Occurrence: 5 Min Restoration: 5 Min
Over current (occurrence/ restoration)	If the current in any phase exceeds the specified threshold current, meter should log over current event.	Occurrence: If $I_p > I_{max}$ Restoration: If $I_p \leq I_{max}$	Occurrence: 5 Min Restoration: 5 Min
Earth Loading (occurrence/ restoration)	Meter shall able to detect and log of earth loading condition if difference in phase and neutral current found less than a specified % of basic current rating of meter for a specified time threshold value. This event will be restored if this difference remain less than the specified threshold value for a specified restoration	Occurrence: If $ I_p - I_n > 10\% I_b$ Restoration: if $ I_p - I_n \leq 10\% I_b$	Occurrence: 5 Min Restoration: 5 Min
3. Power Related Events.			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Power OFF (occurrence/ restoration)	Meter shall detect power OFF if all phase voltages are absent. This event shall be recorded at the time of each power OFF. At the same time power ON event shall be recorded.	5 Min	5 Min
Abnormal Power Off (Occurrence/ restoration)	If meter micro detect power off whereas phase voltage is present than abnormal power will be recorded. Meter shall continue to record energy as per phase voltage and current.	Occurrence: If voltage at meter power supply $< 10\% v_{ref}$ and $V_{pn} > 20\% v_{ref}$. Restoration:	NA
4. Other Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time

Technical Specification For Single Phase Smart Meter

Abnormal External Magnetic Influence (Occurrence/ Restoration)	<p>a. Meter should either be immune or should log the events of attempt of tampering by external magnetic field as per relevant IS13779/ CBIP 325 with latest amendments.</p> <p>b. If the working of meter gets affected under the influence of external magnetic field, meter should record energy at I_{max}. Meter should not compute MD during this period. The meter shall record energy as per actual load once the magnetic field is removed.</p>	As per IS 13779/ CBIP 325	As per IS 13779/ CBIP 325
Neutral Disturbance- HF, DC and Alternating (occurrence/ restoration)	Meter should log the event when AC/DC/ Pulsating voltage is injected in neutral circuit.	Bidder shall define threshold values	Bidder shall define threshold values
Low Power Factor	Meter shall able to detect and log the low PF event if power factor of the load found between 0.2 to 0.5 for a load above than a % threshold value for a threshold time value. Event shall restore if PF factor of load remain out of range 0.2 to 0.5 for a load above than % threshold value	Occurrence: $0.2 < PF \leq 0.5$ and $I_{phase} > 10\% I_b$ Restoration: $(PF < 0.2$ or $PF > 0.5)$ and $I_{phase} > 10\% I_b$	Occurrence: 5 Min Restoration: 5 Min
Single Wire Operation (occurrence/ Restoration)	In case of single wire power is detected , event shall be logged.	If I_p or $I_n > 100$ mA and $V_{pn} < 10\% v_{ref}$.	Occurrence: 5 Min Restoration: 5 Min
Plug in Communication module removal (Occurrence/ Restoration)	Meter should log the removal of communication card. Meter should also log insertion of communication card.	By NC switch/ sensor	
Configuration change to post-paid mode/ pre-paid mode	Meter should log the change in payment mode configuration.	NA	NA
Configuration change to "Forwarded" only" mode/ "Import and Export" mode	Meter should log the change in metering mode configuration.	NA	NA
Overload (Occurrence/ Restoration)	Meter should able to log the status of overload in KW	5 min	5 min
HV Spark	Meter with communication card	Immediately	NA

Technical Specification For Single Phase Smart Meter

(Occurrence/ restoration)/ Jammer	should be immune or log the event in the case of application of ESD upto and including 35 KV.		
5. Non roll over Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Occurrence of cover open	When meter cover opened		Immediately (First occurrence shall always remain in meter memory)
6. Detail of Transaction			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Real Time Clock- Date and Time			
Demand Integration Period			
Profile Capture Period			
Single Action schedule for billing date			
Activity calendar for time zones			
New firmware activated			
Load Limit (Kw) Set			
Enable Load Limit Function			
Disable load limit function			
LLS secret (MR) change			
HLS key (US) change			
HLS key (FW) change			
Global key change			
ESWF change			
MD reset			
7. Control Events:			
Event Description			
Load Switch Status- Disconnected			
Load Switch Status- Connected			

Note:

1. Event ID's shall be defined as per BYPL specification/ IS 155959 (part 2). Approval shall be taken from BYPL prior to manufacturing for Event ID's
2. Programming of threshold values should be possible from remote via proper authentications.
3. Logics of tampers can be changed/ upgraded via firmware up gradation from remote via proper authentication.
4. All the programming changes/ firmware up gradations shall be logged along-with date and time stamp in meter as well as on HES.

Technical Specification For Single Phase Smart Meter

Annexure -E- Meter Enclosure

SL	Clause	Clause Description
1.0	Meter Box Type	Flush type with Completely transparent top cover and base with Incoming and Outgoing cable entry and data downloading arrangement.
2.0	Design	Meter box shall comply following requirement.
2.1	General Requirement	The meter box shall be designed in such a way that no access to the meter body, terminals and hardwired port of the meter shall be possible after installation and sealing of the box without breaking the box itself.
2.2	Theft Protection	<ul style="list-style-type: none"> a. Meter box shall be theft proof i.e. meter box cannot be opened without breaking the seals or meter itself. b. On breaking of the box, clear evidence of the physical tempering shall be visual.
2.3	Parts of the box	<ul style="list-style-type: none"> a. The meter box shall be designed in 02 parts i.e. base and top cover. b. Meter shall be mounted inside the base on fixed moulded pillars by unidirectional screw. c. Meter top cover should be hinge type. d. Cable glands and earthing bolt shall be provided at the base as per construction requirement. e. Proper stiffeners shall be provided in the body of the base and top cover to provide mechanical strength against transportation and installation vibrations.
2.4	Ingress protection	The meter box shall be completely dust and vermin proof. Ingress protection rating of the box shall be minimum IP55.
2.5	Collar of base and cover	<ul style="list-style-type: none"> a. A 'U' shaped groove shall be provided in the collar of the base body, in which UV stabilized rubber 'O' shall be installed. The design of lining shall be such that it provides proper sealing between the cover & base of box to avoid penetration of dust and ingress of water. b. All around projection provided inside the cover periphery which keeps the 'O' ring pressed. c. An outside collar shall also be provided, which shall cover outer surface of the collar.
2.6	Fixing of 'O' ring	<ul style="list-style-type: none"> a. Rubber 'O' Ring should be fixed with suitable adhesive so that the same does not get removed. b. Rubber 'O' ring shall be fixed in a single piece without any gap between open ends. Open end of the 'O' ring shall be provided at the bottom side only.
3.0	Material	The material shall be as follow:
3.1	Box material	<ul style="list-style-type: none"> a. The material of meter box shall be flame retardant with inflammability level V0 having good dielectric and mechanical strength. b. The top Cover and Base of the box shall be made out of transparent polycarbonate with minimum 90% visibility so as to ease installation and monitoring of box against any tampering. The material shall be 'UV' stabilized to ensure that the moulded meter box should not change in colour, shape, size or should not get brittle after exposure to UV rays.
3.2	Hardware	All the metal hardware including hinges, U latches, mounting screws, downloading port ring etc shall be of rust proof stainless steel.
3.3	Cable glands	Polyamide Nylon-66 with flammability class FV0

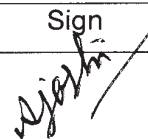
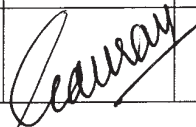
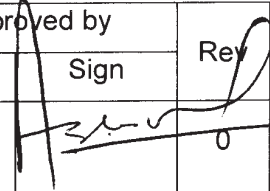
Technical Specification For Single Phase Smart Meter

SL	Clause	Clause Description
4.0	Construction	<ul style="list-style-type: none"> a. Meter box shall be constructed by moulding of polycarbonate material as specified in clause no. 3.1 b. Thickness of meter box shall be minimum 2.0 mm.
4.1	Moulding	The box shall be made through Injection moulding or better method.
4.2	Base	Meter shall be factory fitted inside base body using unidirectional screws, on fixed mounting pillars, moulded in to the base of sufficient strength, so that removing of meter shall not possible without breaking the meter box or meter itself.
4.3	Top cover	Hinge type
4.3.1	Hinge type	<ul style="list-style-type: none"> a. Minimum 02 no's concealed / internal hinges, not visible or accessible from outside the box without breaking the box itself. b. Minimum 02 no's U latches shall be provided to closed the box with sealing arrangement at each U latch. c. After closing the U latches no play/ gap shall exist between base and top cover.
5.0	Padlocking	The box shall also have padlocking facility.
6.0	Cable entry	<ul style="list-style-type: none"> a. 02 no's as incoming and outgoing at the 45 Deg Chamfer bottom corners suitable for 2CX25 Sqmm armoured aluminum cable. b. Cable entry must be at the bottom diagonal ends of the meter box. Appropriate clearance shall be provided between the cable entry and position of meter terminals for proper cable bending and connection. c. Minimum 60 mm vertical space shall be provided from the terminals of meter to centre of cable gland to provide sufficient bending radius and working space.
6.1	Cable Gland	<ul style="list-style-type: none"> a. Two nos. of Elbow shaped glands made out of Polyamide Nylon-66 suitable for 2CX10 / 2CX25 sqmm aluminium armoured cable shall be provided on both cable entries in the box. b. Glands shall be designed in such a manner that the same cannot be unscrewed / removed from the box from outside. Manufacturer may either supply two nos. of check nuts or any other alternate design to meet this requirement.
7.0	Earthing bolt	<ul style="list-style-type: none"> a. Earthing bolt of M6 with nut and washer shall be provided on left side of the body of meter box. b. The arrangement shall be such that one earth point shall be available for customer and external earthing provided by BYPL can be terminated. c. Necessary symbol shall be provided for earth terminal.
8.0	Mounting	Mounting arrangement shall be as follow
8.1	Meter mounting pillars	<ul style="list-style-type: none"> a. Fixed type, moulded in to the base body as per the requirement of meter mounting holes. b. Stiffeners shall be provided at the base of the mater mounting pillars.
8.2	Meter box mounting	<ul style="list-style-type: none"> a. Four (4) nos. fixing holes of 6 to 6.5 mm diameter at the back surface of box shall be provided to fix the same on flat wall. b. Mounting holes shall not be obstructing by Incoming or Outgoing cables.
8.3	Box Mounting spacers	04 no's, 25 mm minimum mounting spacer moulded at the mounting holes of back surface of the meter box in order to provide space between meter back surface and wall.

Technical Specification For Single Phase Smart Meter

SL	Clause	Clause Description
8.4	Box Mounting accessories	Long pan head self tapping SS screws and washers shall be provided by the supplier with every box. 4 no's plastic fixing plugs suitable for self tapping screws shall also be provided.
9.0	Data Downloading arrangement	<ul style="list-style-type: none"> a. Option 1: <ul style="list-style-type: none"> i. Slot for optical head with non removable corrosion ferromagnetic metal ring. ii. Data downloading shall not be affected by scratches on data downloading port or with ageing of box. iii. Data downloading shall not be affected by visible light conditions. b. Option 2: <ul style="list-style-type: none"> i. DB9 RS232 connector shall be provided at the top cover of box to download meter as specified in clause no. 9.1 ii. Meter shall be downloadable without opening of the box/ breaking of seals. iii. This arrangement shall not de-rate the IP rating of meter box. iv. A Top hinges and bottom sealable cover shall be provided on the data downloading slot. v. Data downloading shall not be affected by visible light conditions.
9.1	Optical to RS232 cable (If option 2 as per clause no. 9.0	Optical reader with 9 pin D-type female connector cable shall be provided in each meter box. Push fit type protective cover with sealing arrangement for data downloading port on the cover of the meter box has to be provided. The optical meter reader with 9 pin D-type female connector cable of all the meter boxes (100%) shall be tested for meter downloading before dispatch.
10.0	Marking	<p>Following marking shall be provided on both top cover and base by indiligible laser printing/ screen printing or embossed from inside of the box.</p> <ul style="list-style-type: none"> a. BYPL insignia shall be embossed on the base & cover of meter box. b. Meter serial no. (Both on base and cover of meter box) c. Purchaser's PO no. and date. d. Purchaser's Name. e. Name or trade mark of seller f. Any other detail required at the time of approval.

Specification for
Three Phase Whole Current Smart meter
Specification no – SP-TPWCSM-118-R0

Prepared by		Reviewed by		Approved by		Rev	Date
Name	Sign	Name	Sign	Name	Sign		
AJ		GS		AA		0	25/04/2018

Technical Specification For Three Phase Whole Current Smart Meter**Index**

Record of Revision	3
1.0 Scope of Supply	4
2.0 Codes & standards	4
3.0 Service Conditions	6
4.0 Distribution System Data	6
5.0 Electrical and Accuracy Requirement	6
6.0 Construction	7
7.0 Functional Requirement	11
8.0 Meter Display	18
9.0 Data and communication protocol/ HES/Integrations/ Software	18
10.0 Name Plate	19
11.0 Component Specification	20
12.0 Quality Assurance, Inspection and Testing	21
13.0 Packing, Marking, Shipping, Handling and Storage	22
14.0 Deviations	23
15.0 Drawing Submission	23
16.0 Delivery	24
Annexure- A- Guaranteed Technical Particulars	25
Annexure - B- Recommended Accessories / Spares	25
Annexure - C- Integration Requirement of Meters with NIC and HES	26
Annexure- D- Tamper and Fraud Detection Events	27
Annexure -E- Meter Enclosure	31

Technical Specification For Three Phase Whole Current Smart Meter

Record of Revision

Item/Clause No.	Change in Specification	Reason of change	Approved By	Rev

Technical Specification For Three Phase Whole Current Smart Meter

1.0 Scope of Supply

This specification covers the following for Three Phase 240 V, 20A-100A Static Watt hour smart meters of accuracy class 1.0 with plug in communication modules suitable for RF/ cellular and integrated load control switches.

- A. Design, manufacture, testing at manufacturer works before dispatch, packing, delivery and submission of all documentation.
- B. Any accessories / hardware required for installation and operation for the meter.

2.0 Codes & standards

Materials, equipment and methods used in the manufacturing of above mentioned equipment shall conform to the latest edition/ of following

S No.	Standard Number	Title
2.1	Indian Electricity Act	IE Act 2003
2.2	CEA Metering Regulations	With latest amendments
2.3	CBIP Manual (Pub no.-325)	Standardization of AC Static Electrical Energy Meters
2.4	IS- 16444 (Part 1)	AC Static Transformer Operated Watt-hour Smart Meters, Class 1.0 and 2.0 Part 1 Specification
2.5	IS- 13779	AC Static Watt-hour Meters, Class 1 and 2 – Specification
2.6	IS-15959 (Part 1)	Data Exchange for Electricity Meter - Reading Tariff and Load Control - Companion Specification
2.7	IS-15959 (Part 2)	Data Exchange for Electricity Meter - Reading Tariff and Load Control (Part 2)- Companion Specification for smart meter
2.8	IS- 11448	Application guide for AC Electricity meters
2.9	IEC- 62052-11	Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 11: Metering equipment
2.10	IEC- 62053-21	Electricity metering equipment (A.C) - Particular requirements - Part 21: Static meters for active energy (classes 1 and 2)
2.11	IEC- 62053-52	Electricity metering equipment (AC) - Particular requirements - Part 52: Symbols
2.12	IEC 62053-61	Electricity metering equipment (A.C.) - Particular requirements - Part 61: Power consumption and voltage requirements
2.13	IEC 62058-11	Electricity metering equipment (AC) - Acceptance inspection - Part 11: General acceptance inspection methods
2.14	IEC 62058-31	Electricity metering equipment (AC) - Acceptance inspection - Part 31: Particular requirements for static meters for active energy (classes 0,2 S, 0,5 S, 1 and 2)
2.15	IEC 60736	Testing Equipment for electrical Energy meter
2.16	IS/IEC/TR 62051:Part 1:2004	Electricity Metering — Data Exchange For Meter Reading, Tariff And Load control — Glossary Of Terms Part 1 Terms Related To Data Exchange With metering Equipment Using DLMS/ COSEM

Technical Specification For Three Phase Whole Current Smart Meter

2.17	IEC 62056-1-0:2014	Smart metering standardisation framework
2.18	IEC 62056-3-1:2013	Use of local area networks on twisted pair with carrier signalling
2.19	IEC 62056-4-7:2014	DLMS/COSEM transport layer for IP networks
2.20	IEC 62056-5-3:2017	DLMS/COSEM application layer
2.21	IEC 62056-6-1:2017	Object Identification System (OBIS)
2.22	IEC 62056-6-2:2017	COSEM interface classes
2.23	IEC 62056-6-9:2016	Mapping between the Common Information Model message profiles (IEC 61968-9) and DLMS/COSEM (IEC 62056) data models and protocols
2.24	IEC 62056-7-3:2017	Wired and wireless M-Bus communication profiles for local and neighbourhood networks
2.25	IEC 62056-7-5:2016	Local data transmission profiles for Local Networks (LN)
2.26	IEC 62056-7-6:2013	The 3-layer, connection-oriented HDLC based communication profile
2.27	IEC TS 62056-8-20:2016	Mesh communication profile for neighbourhood networks
2.28	IEC TS 62056-9-1:2016	Communication profile using web-services to access a DLMS/COSEM server via a COSEM Access Service (CAS)
2.29	IEC 62056-9-7:2013	Communication profile for TCP-UDP/IP networks
2.30	IEC 62056-21:2002	Direct local data exchange
2.31	DLMS- White Book	Glossary of DLMS/COSEM terms
2.32	DLMS- Blue Book	COSEM meter object model and the object identification system
2.33	DLMS- Green Book	Architecture and protocols to transport the model
2.34	DLMS- Yellow Book	Conformance testing process
2.35	IEEE 802.15.4	Standard for Local and metropolitan area networks.
2.36	IEEE 802.15.4u	Standard for Local and metropolitan area networks (Use of the 865 MHz to 867 MHz Band in India)
Order of precedence between different standards shall be as follow:		
i	Indian Standards Issued By BIS	
ii	IEC standard	
iii	Other standards like CBIP, DLMS etc.	

Technical Specification For Three Phase Whole Current Smart Meter

3.0 Service Conditions

3.1	Temperature Range	Operation range: -10 Deg C to 55 Deg C Limit range of operation: -25 to 60 Deg C Limit range of storage / transport : -25 to 70 Deg C
3.2	Relative Humidity	0 to 96 %

4.0 Distribution System Data

4.1	Supply	3 Phase AC, 4 wire
4.2	Voltage	415 V \pm 6%
4.3	Frequency	50 Hz \pm 5%
4.4	System Neutral	Solidly Earthed

5.0 Electrical and Accuracy Requirement

5.1	Meter Type	Meter Type 1: 3- ϕ , 4 wire Static Watt-hour Smart Meter Meter Type 2: 3- ϕ , 4 wires Static Watt-hour Smart Meter fitted in polycarbonate box. Meter Type 1/ Type 2 shall be offered as per purchaser's requisition/ BOQ.
5.2	Connection	Direct / whole current
5.3	Rated Voltage	240V (phase to neutral) with variation of +30% & -40%. However meter should withstand the maximum system voltage.
5.4	Rated Current	Ib -20A and I _{max} - 100 A
5.5	Starting current	0.2 % of base current
5.6	Rated Frequency	50Hz +/- 5%
5.7	Accuracy Class	1.0 (IS13779 applies for accuracy requirements)
5.8	Power Consumption	As per IS 16444 (Part 1)
5.9	Meter constant	Imp/ unit (Bidder to specify meter constant)
5.10	Calibration	Meter shall be software calibrated at factory and modification in calibration shall not be possible at site by any means or external influence.
5.11	Insulation Level	Meter shall withstand an insulation test of 4 KV and impulse test at 8 KV
5.12	Influence of supply voltage	As per clause 5.5.2 of IS 15884
5.13	Short time over current	As per clause no. 5.5.3 of IS 15884
5.14	Immunity to phase and earth fault	As per clause no. 9.6 of IS 13779
5.15	Influence of Self Heating	As per IS 5.5.4 of IS 15884
5.16	Influence of Heating	As per IS 5.5.5 of IS 15884

Technical Specification For Three Phase Whole Current Smart Meter

5.17	Electromagnetic compatibility	<ul style="list-style-type: none"> a. Meter shall remain immune to electrostatic discharge (upto and including 35KV), electromagnetic HF field and fast transient burst. b. The meter shall be designed in such a way that conducted or radiated electromagnetic disturbances as well as electrostatic discharge do not influence the meter. c. Meter shall be type tested for electromagnetic compatibility. d. Meter shall comply requirement of clause no. 5.5 and 5.5 of IS 15884
5.18	Limits of error due to influence quantities	<p>Meter shall work within guaranteed accuracy as per IS 13779/ IEC62053-21/ CBIP325 (most stringent standard to be followed) under and after influence of following :-</p> <ul style="list-style-type: none"> a. Current Variation b. Ambient Temperature variation c. Voltage variation d. Frequency variation e. 10% third harmonic in current f. Reversed phase sequence g. Voltage unbalance h. Harmonic components in current and voltage circuit i. DC and even harmonics in AC current circuit j. Odd harmonics in AC current circuit. k. Sub harmonics in AC current circuit l. Continuous (DC) "stray" magnetic induction of 67mT+/-5%. m. Continuous (DC) "abnormal" magnetic induction of 0.27T+/-5%. n. Alternating (AC) "stray" magnetic induction of 0.5mT+/-5% o. Alternating (AC) "abnormal" magnetic induction of 10mT. p. External magnetic field 0.5 T q. Electromagnetic HF fields r. Radio frequency interference s. DC immunity test <p>Note: BSES reserves the right to formulate any other test method to check magnetic immunity/ logging of meter. Meter with logging provision will be preferred.</p>

6.0 Construction

6.1	General	Construction of meters shall confirm to the IS 16444 (Part 1)
6.2	Base Body	Material - Opaque and UV stabilized polycarbonate of grade LEXAN 143/ 943 or Equivalent with V0 inflammability level.
6.3	Top Cover	<ul style="list-style-type: none"> a. Material: Transparent/Opaque and UV stabilized polycarbonate of grade LEXAN 143/ 943 or Equivalent with V0 inflammability level. b. Top cover and base should be Ultrasonically/Chemically welded.

Technical Specification For Three Phase Whole Current Smart Meter

6.4	Terminal Block	<ul style="list-style-type: none"> a. Material - Flame retardant glass filled polycarbonate of grade 500 R or equivalent. b. Terminal block shall be capable of passing the tests as per ISO-75 for a temperature of 135C and pressure of 1.8MPa. The terminals shall be designed so as to ensure adequate and durable contact such that there is no risk of loosening or undue heating.
6.5	Terminal cover	<ul style="list-style-type: none"> a. Material - UV stabilized transparent/Opaque polycarbonate cover b. Provision of sealing at two points through sealing screw. c. The sealing screws shall be held captive in the terminal cover. d. The terminal cover shall be extended type with baffle wall above the cable entry base wall so that access to the terminals is not possible (even with thin metallic wire) without breaking the seal. Terminal cover should have provision for cable entry from bottom. e. Diagram of external connections should be embossed on terminal cover. Sticker is not acceptable. f. Mechanism shall be provided to record an event with occurrence and restoration in case of meter enclosure/ terminal cover is opened.
6.6	Terminals	<ul style="list-style-type: none"> a. Terminals shall be suitable upto 50 Sqmm aluminium cable. b. Two no's flat head screws per terminal shall be provided c. Material of terminals, screws and washers should be brass or tinned copper. Terminals shall be tested for continuous current of 150 % I_{max}. d. Terminals shall be clearly marked for phase / neutral / outgoing etc. e. Clearances and creep age shall be as per IS 13779.
6.7	Ingress Protection	IP 51 or better, but without suction in the meter.
6.8	Output device	Meter should have flashing LED visible from the front to represent energy recording. Resolution shall be such that satisfactory accuracy test can be conducted at the lowest load in less than 5 minutes and starting current test in less than 10 minutes.
6.9	RTC	<ul style="list-style-type: none"> a. The meter shall have internal real time crystal clock to set date and time. b. Drift in time of this clock shall not be more than ± 5 minutes/year at a reference temperature of 27°C. c. Meter RTC shall be corrected automatically by the system in synchronization to the network RTC. d. HES will sync RTC at least once a day.
6.9.1	Time keeping	As per IS 15884
6.10	Battery	Lithium ion battery with guaranteed shelf life of 10 years and capacity life of 15 years. Lithium thioyl Chloride battery will be preferred. In case battery removal or total discharge same should not affect the working & memory of the meter even in case of single wire power condition.
6.11	Memory	Non volatile memory independent of battery backup, memory should be retained up to 10 year without any auxiliary power.

Technical Specification For Three Phase Whole Current Smart Meter

6.12	Self Diagnostic feature	<p>Meter shall have self diagnostic for the following</p> <ol style="list-style-type: none"> Date and RTC. Battery. Non volatile memory. Display Communication Card Status
6.13	Load Control Switch	<ol style="list-style-type: none"> Smart meter shall be equipped with integrated load control switches to control flow of electricity to the load at the instance of connect/ disconnect commands as per functional need of the system. Load switch for connect/ disconnect purpose shall be mounted inside the meter with suitable arrangement. Load Switches shall be provided for all phases and neutral The rating of switches used shall be in line with meter rating. All the switches shall operate simultaneously.
6.13.1	Performance requirement for load switching	<ol style="list-style-type: none"> Utilization category of the load switch shall be UC3 as per clause no. 5.6.6.2 of IS 15885. All load switches shall operate simultaneously.
6.14	Optical port	<p>Meter shall have an optical port with a metal ring to hold magnet of probe. Optical port shall comply with hardware specifications provided in IEC-62056-21.</p>
6.15	Communication Module Interface	<ol style="list-style-type: none"> Meter should have the provision for 01 no's plug in communication module for connectivity. The same interface shall be compatible with both Cellular and RF communication technologies interchangeable in field. Interface shall support data transfer between meter and network interface card over UART/ RS232. Bidder shall explain its pin out and standard in detail. Meter shall have mechanism to log communication module removal as an event in its memory with date and time stamp. Meter Vendor shall work with BYPL designated RF provider to integrate their module in the meter as per integration requirement mentioned in annexure 'C'. Preferred location of communication card module shall be on top of meter.
6.15.1	Communication modules	<ol style="list-style-type: none"> Smart meter shall have 01 no's plug-in type communication modules/ Network Interface card (NIC) for connectivity of meter to HES from following options as per tender requirement: <ol style="list-style-type: none"> Communication Module/ NIC Type 1: RF based suitable for communication Network of BYPL designated RF canopy provider. Communication Module/ NIC Type 2: LTE 4G with 3G and 2G fall back as per Indian telecom Standards. Communication Module/ NIC Type 3: RF and cellular communication module (LTE 4G with 3G and 2G fall back as per Indian telecom Standards). Meter shall have separate indications on display/ for remote and local communication. Communication module shall held in a casing which can

Technical Specification For Three Phase Whole Current Smart Meter

		<p>be directly plugged in the meter. Sealing screw shall be provided.</p> <p>d. Communication module/ NIC shall be purchased from BYPL designated RF provider.</p>
6.16	Last Gasp	Meter shall have provisions to provides last gasp signals through communication module in case of power failure. Bidder should explain in detail the provisions provided in meter to achieve the requirement.
6.17	Meter Sealing Arrangement	Sealing should be in accordance with IS and CEA metering regulations with latest amendments. Approval shall be taken from purchaser for location of seals.
6.17.1	Manufacturer's Seals	<p>a. One Polycarbonate seal to be provided on meter cover.</p> <p>b. Minimum one seal as Hologram type, numbered with hologram transfer on tamper proof paper seal. Seal should not be just Hologram sticker (100% hologram).</p>
6.17.2	BSES Seals	<p>a. Minimum one seal as Hologram type, numbered with hologram transfer on tamper proof paper seal. Seal should not be just Hologram sticker (100% hologram). Meter sides should not have sharp edges to avoid damage to hologram seals.</p> <p>b. Minimum one Polycarbonate seal should be provided on top cover.</p> <p>c. Seals will be issued to manufacturer free of cost.</p> <p>d. 02 no's polycarbonate seals shall be provided for communication module.</p>
6.17.3	Seal record	Record of all seals shall be forwarded to purchaser with each lot.
6.18	Name Plate and marking	<p>a. Meter should have clearly visible, indelible and distinctly marked name plate in accordance with IS 16444 (Part 1) & clause no. 9.0 of this specification.</p> <p>b. All markings and details shall be printed by laser only.</p> <p>c. Paper stickers are not allowed for name plate.</p>
6.19	Resistance against heat and fire	The terminal block and Meter case shall have 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.
6.20	Meter Box	As per Annexure 'E' if required in purchaser's requisition. Meter shall be factory fitted in meter enclosure by unidirectional screws.
6.21	Guarantee	<p>a. 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier</p> <p>b. Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period, these defective/inoperative meters shall be replaced as per meter service level agreement.</p>

Technical Specification For Three Phase Whole Current Smart Meter

7.0 Functional Requirement

7.1	Meter category	Smart meter shall comply D2 category of IS 15959 (Part 2).
7.2	Mode of metering	<p>It should be possible to configure meters in following modes of metering:</p> <ul style="list-style-type: none"> a. Forwarded Only: In this mode any export active energy shall be treated as import energy and shall be recorded in forward only register. Apparent energy calculation in this mode shall be as per clause no. 6.5. b. Bidirectional: Both Import and export energy recording shall be applicable in this mode of metering and relevant registers shall be updated. <p>Any change in metering mode shall be logged in events with date and time stamp. Default mode of metering shall be forwarded only until specified in tender requirement otherwise.</p>
7.3	Payment Mode	<p>It should be possible to configure meter in following modes of payment:</p> <ul style="list-style-type: none"> a. Post payment mode b. Prepayment Mode <p>Any change in payment mode shall be logged in events with date and time stamp. Prepayment facility shall be achieved by server / HES. Default mode of metering shall be post payment until specified in tender requirement otherwise.</p>
7.4	KVAH Calculation	Lag only: KVAh is computed based on KVArh and KWH value. If PF=1, or leading, then KVAh = KWH. At no instance KVAh < KWh.
7.5	MD calculation	Block / sliding window with default demand integration period of 1800 s configurable to 900 s as per requirement. Meter should be configurable for block/ sliding window at the time of manufacturing. This change should not be possible in the field. Extended register shall be used for MD recording.
7.6	TOU Metering	<ul style="list-style-type: none"> a. Meter shall be capable of doing TOD metering in minimum 4 tariff rate registers programmable for minimum 8 time zones and 4 seasonal profiles. b. TOU metering shall be implemented by the activity colander method of IS 15959 Part 1 clause 9/ DLMS UA-1000-1 c. Special Day table shall be defined as per DLMS UA-1000-1 d. Default TOU programming shall be as per latest DERC guidelines. Prior approval shall also be taken from BYPL for the same. e. Tariff rate registers shall be as follow R1: Rate register for Peak R2: Rate register for Normal R3: Rate Register for Off Peak

Technical Specification For Three Phase Whole Current Smart Meter

7.7	Instantaneous Parameters	<p>All the parameters mentioned in table 'A1' of IS 15959 along with following additional parameters shall be supported by meter.</p> <ul style="list-style-type: none"> a. RF/ GSM signal Strength in milli db. b. % THD in R phase Voltage c. % THD in Y Phase Voltage d. % THD in B Phase Voltage e. % THD in R phase Current f. % THD in Y Phase Current g. % THD in B Phase Current h. Displacement PF i. GPS Coordinates j. Temperature <p>Method of Harmonic Measurement shall confirm to the IEEE 519 2015.</p>
7.7.1	Association Rights	As per Clause 11.1.1 of IS 15959 (Part 2).
7.8	Billing data	<ul style="list-style-type: none"> a. Billing parameters shall be generated at the end of each billing cycle and stored in memory as per provisions provided in clause no. 14 of IS 15959 (Part 2). b. 6 no's billing cycle parameters shall be remain in meter memory along with current cycle parameters and shall be available for reading as well as profile and or 'by entry' for selective access. c. All the parameters mentioned in table 'A4' of IS 15959 (Part 2) shall be supported by meter.
7.8.1	Association Rights	As per clause 14 of IS 15959 (Part 2).
7.8.2	Selective access	Support for selective access shall be provided for billing parameters as per clause no 11.3 of IS 15959 (part 1).
7.8.3	Billing period reset/ MD reset	00:00 Hrs of 1st of every month
7.8.4	Billing period reset mechanism	As per clause 10 of IS 15959 (Part 1)
7.8.5	Billing period counter	Cumulative billing period counter since installation and available billing periods shall be provided as per clause 11.2 of IS 15959 (Part 1).
7.9	Load survey Data	<ul style="list-style-type: none"> a. Load survey parameters shall be measured and recorded at the end of each profile capture period for last 35 Power ON days. b. All the parameters mentioned in table 'A15' of IS 15959 (Part 2) along with following additional parameters shall be supported by meter: % THD in R phase Voltage % THD in Y Phase Voltage % THD in B Phase Voltage % THD in R phase Current % THD in Y Phase Current % THD in B Phase Current
7.9.1	Association Rights	As per clause 18 of IS 15959 (Part 2)
7.9.2	Profile capture period	Default 1800 s programmable to 900 s.
7.9.3	Selective Access	Support for selective access shall be provided for billing parameters as per clause no 11.3 of IS 15959 (part 1).

Technical Specification For Three Phase Whole Current Smart Meter

7.10	Daily load profile	Daily load profile parameters shall be measured and recorded at each midnight i.e. 00:00 hrs for last 35 Power On days. All the parameters mentioned in table 'A16' of IS 15959 (Part 2) shall be supported by meter as Daily load profile parameters.
7.10.1	Association rights	As per clause no 19 of IS 15959 (Part 2).
7.11	General Purpose Parameters	Following parameters shall be provided in Non Volatile memory (NVM) of the meter as per clause 16 of IS 15959 (Part 2).
7.11.1	Name Plate Detail	As per Table 'A26' of IS 15959 (Part 2) with following additional parameters. a. Month of manufacturing.
7.11.2	Association rights	As per clause 22.1 of IS 15959 (Part 2).
7.11.2	Programmable parameters	These parameters can be programmed remotely by HES and locally by CMRI via proper access writes. Every transaction shall be logged in non volatile memory of the meter with date and time stamp. Programming of any of the parameters shall increment the 'Cumulative programmable count' value. All the parameters mentioned in table Table 'A27' of IS 15959 (Part 2) shall be supported by meters with following additional parameters. a. Time trigger value for stamp event.
7.11.2.1	Association rights	As per clause 22.2 of IS 15959 (part 2)
7.11.3	Push Services	<ul style="list-style-type: none"> a. Smart meter is able to automatically notify data, event, and messages to a destination client system in an unsolicited manner (without a request from a client) as per clause no 6 of IS 15959 (Part 2). b. Randomization: Data from different endpoints shall be pushed intelligently on the network in order to avoid excessive traffic on the network for example in case all the endpoints will push load survey data simultaneously, then it may result in network choking or inefficient performance. Therefore with the help of intelligent techniques such field scenarios shall be handled effectively. c. It shall also be possible to configure push services for all profiles i.e instantaneous, billing, load survey, daily energy and events. Bidder should explain its capability to configure push services. However following push services shall be available by default. <ul style="list-style-type: none"> i. Load survey profile data at after every 4 hours configurable to any predefined interval. ii. Mid night data at 00:00 hrs of every day. iii. Billing profile data on occurrence of billing.

Technical Specification For Three Phase Whole Current Smart Meter

7.11.3.1	Periodic push (Smart meter to HES)	<ul style="list-style-type: none"> a. Meter shall be able to push instantaneous parameters to HES at predefined intervals. Parameters required for push shall be intimated during detailed engineering in the vent of order. b. Other attributes as per IS 15959 (Part 2) i.e. Send Destination, Communication window, Randomization time interval, number of retries and repeat delay shall be decided in the event of manufacturing.
7.11.3.2	Event Push (Smart meter to HES)	<ul style="list-style-type: none"> a. Meter is able to report HES, the status change of any of the identified events mapped in to event status word (ESW) of size 128 bits by pushing following objects to HES. <ul style="list-style-type: none"> i. Device ID ii. Push Setup ID iii. Real time clock- Date and Time iv. Event Status Word 1 (ESW 1). b. Each of the bits in ESW shall reflect the current state of the event and are mapped against each of the identified events. c. An event status word filter (ESWF) of 128 bit shall also be provided to configure events for event push. Events which are supported in meter shall only be configured for event push. Bit value 1 in ESWF shall indicate that the event is supported and value 0 indicates that event is not supported for event push. Position of the event bit in ESWF shall be same as in ESW.
7.11.3.3	Event status Bit mapping	As Per IS 15959 (Part 2)
7.12	Firmware upgrade	<ul style="list-style-type: none"> a. Smart meter shall support remote firmware upgrade feature for meter firmware without loss of any data and metrology for a part or complete firmware of meter. b. Firmware upgrade shall use the Image transfer classes and mechanisms specified in IEC62056-6-2 and IEC62056-5-3. c. Broad cast facility shall be supported in HES for simultaneously upgrading the firmware of a group of meters installed in field. d. Firmware upgrade feature shall be provided with proper security. The design shall take into account field scenarios such as power failure during F/W upgrade. e. Once the firmware is upgraded, meter shall send an acknowledgment to HES. It shall also log it as an event in its memory. f. Meter shall support capability to self register the meter with new firmware. g. The execution time of the change of the firmware within the meter should be below 1 minute
7.13	Support for broadcast message	<p>Meter shall support connection less messaging services of DLMS to support broadcast messages for a group of meters for following actions:</p> <ul style="list-style-type: none"> a. Gap reconciliations. b. Firmware upgrade.

Technical Specification For Three Phase Whole Current Smart Meter

		<ul style="list-style-type: none"> c. On demand readings. d. Meter connection and disconnection. e. Updating of Programmable parameters.
7.14	Disconnection mechanism	<ul style="list-style-type: none"> a. The Smart meter shall support disconnection (all the switches shall operate simultaneous) on the following conditions as per clause 11 of IS 16444 (Part 1): <ul style="list-style-type: none"> i. Over current (105 % of I_{max} in any element for predefined persistence time.) ii. Load control limit (Programmable) iii. Pre-programmed tamper conditions (Factory programmed) iv. Disconnection signal from Head end system. v. Pre paid function for prepayment mode. b. Meter shall use the disconnection control object as defined in clause 10 of IS 15959 (Part 2). c. Load limit function shall be disabled by default until other specified.
7.15	Local reconnection mechanism	<ul style="list-style-type: none"> a. Meter shall be able to reconnect load switches locally only for Overload and load control limit disconnections. b. The meter will try to reconnect the load up to predefined time, with predefined interval (Time and interval is programmable). c. If the consumption is still more than the programmed limits, it will lock out and wait for 30 minutes. d. If the consumption is still above the limit, the procedure defined above in 1 and 2 shall be repeated. e. It shall be possible to remotely connect/disconnect the relay via commands from HES. The remote reconnect shall not interrupt the normal connect/disconnect cycle. f. In case of relay malfunction i.e., connect/disconnect action of relay is not taking place due to welding of contacts or any other reason, then it shall be logged as an event in the Non-rollover compartment. Same shall be sent as an alert to HES. g. Remote command shall have priority over local communication.
7.16	Reconnection mechanism	<ul style="list-style-type: none"> a. Reconnection shall be done from HES except for over current and load control limit. In case of failure of communication / HES, reconnection shall be possible through Hand Held Device (CMRI) locally via proper security. b. Reconnection in case of prepayment meter shall be as per prepayment profile.
7.17	Status of load switch	<p>Indication of status of relay i.e. connected/ disconnected should be available on display as well as through communication to HES.</p> <p>Connection and disconnection should be logged as events.</p>

Technical Specification For Three Phase Whole Current Smart Meter

7.18	First breath and last gasp	<ul style="list-style-type: none"> a. Indication of status of relay i.e. connected/ disconnected should be available on display as well as through communication to HES. b. Connection and disconnection should be logged as events.
7.19	Security	Advanced security outlined in clause 7.1.2 of IS 15959 (Part 1) shall be provided.
7.19.1	Encryption for data communication	As per clause 7.1 of IS 15959 (Part 2)
7.19.2	Encryption/ Authentication for data transport	As per clause 7.2 of IS 15959 (Part 2)
7.19.3	Key requirement and handling	As per clause 7.3 of IS 15959 (Part 2)
7.19.4	NIC Security	<ul style="list-style-type: none"> a. Proper security at end points as well as network level shall be present to prevent unauthorized hacking of the end points or the network itself. b. The meter password is required to open a session between NIC and meter and is required to gain clearance from the meter to perform requested operation. c. If clearance not gains, the meter locks out communication for 1 minute. The meter maintain counter for monitoring of unsuccessful attempts of performing meter operations and alerts to HES. The counter is incremented each time a password clearance operation fails. d. Up to 3 no's successful attempts are allowed, after which the port is locked out until authenticated from system administrator.
7.20	IP communication profile support	Meter shall support TCP-UDP/ IP communication profile for smart meter to HES. Please refer clause 8 of IS 15959.
7.20	Consumer display unit (Optional)	Provision of consumer interface unit (CIU) to access meter from consumer premises. Wireless IHD powered by battery.
7.21	Event and tamper detection	Meter shall detect and log any exceptional/ fraud/ tamper conditions in its memory as an event. In addition to this all transactions and control shall also be recorded as an event in meter memory. Each event type shall be identified by an event ID.
7.21.1	Association Rights	<p>Each event shall be available to download as per following association rights.</p> <ul style="list-style-type: none"> a. Public Client: No access b. Meter Reader: Read only c. utility Settings: Read only d. Push Services: Read Only for identified events as per ESWF

Technical Specification For Three Phase Whole Current Smart Meter

7.21.2	Compartments of events	<p>Meter shall be able to log events in following compartments</p> <ol style="list-style-type: none"> Voltage Related Events Current Related Events Power Related Events Others Events Non Roll Over Events Transaction related events Control Events <p>Occurrence and Restoration of Voltage Related, current related, power related and other events shall be logged in meter memory as per IS 15959 (Part 2). Please refer annexure 'A' for description of events, Event ID, Logics of events and threshold values of events.</p> <p>Threshold values shall be factory programmable.</p> <p>Selective access shall be provided as per clause 11.3 of IS 15959 (Part 1).</p> <p>For each of the events a certain list of parameters shall be captured as per clause 'a'</p> <p>For each occurrence event captured, the cumulative tamper count shall be incremented.</p> <p>Only Real clock (date and time) and event code shall be captured events in compartments mentioned at sl no. 'd', 'f', 'g', 'h'.</p>
7.21.3	Parameter Snapshot	<p>Following parameters mentioned above are to be captured when event occurrence and restoration is logged as per IS 15959 (Part 2).</p> <ol style="list-style-type: none"> Date and time of event Event code R Phase Current Y Phase Current Y Phase Current Neutral Current R Phase Voltage Y Phase Voltage B Phase Voltage Three Phase Power factor Cumulative energy- kWh
7.21.4	Event Logging	<p>The meter shall log minimum 100 tamper events (ensuring at least 20 events for each tamper).</p>
7.21.5	Tamper Indication	<p>Appropriate Indications/Icons for all tampers should appear on the meter display either continuously or in auto display mode.</p>
7.22	Phasor Representation	<p>Meter shall support parameters required to develop phasors of current and voltage at HES.</p>

Technical Specification For Three Phase Whole Current Smart Meter

8.0 Meter Display

8.1	LCD Type	STN Liquid crystal with backlit
8.2	Viewing angle	<ul style="list-style-type: none"> a. Minimum 120 Degree. b. The display visibility should be sufficient to read the Meter mounted at height of 0.5 m as well as at the height of 2 m.
8.3	Size of LCD	Minimum 10X5mm
8.4	LCD Digits	Total 6+1 digits
8.5	LCD language	English
8.6	Display modes	<ul style="list-style-type: none"> a. Auto Mode b. Manual Mode c. Sub active mode Display list shall be finalized during detailed engineering in the event of order.
8.7	Display indications	Appropriate indications/flags for all tampers and self diagnostic features should be provided.

9.0 Data and communication protocol/ HES/Integrations/ Software

9.1	Data Exchange protocol	<ul style="list-style-type: none"> a. Meter should comply Indian companion of data exchange and tariff control specification IS 15959 (Part 2). b. In case of additional requirement from IS 15959 (part 2), they shall be as per DLMS standards/ IEC DLMS protocols suite (62056). c. Bidder shall explain in detail the additional parameters/ services/ methods used in meters from IS 15959 (part 2) and its reference to DLMS books/ IEC. d. Prior to manufacturing of meters bidder shall provide a detailed specification explaining all parameters/ services/ methods used in meter in addition to IS 15959 (Part 2).
9.2	Integration with HES	<ul style="list-style-type: none"> a. Bidder shall work with BYPL IT team/ BYPL designated system integrator to integrate its meter with BYPL HES system. b. Bidder shall prepare detailed documents as mentioned in above clause and submit it for BYPL approval and integration with HES.
9.3	Base computer software	Licensed Software with the following features should be supplied for free to download meter through optical port.
9.3.1	Operating System	BCS should be compatible for latest Windows operating system.
9.3.2	Security	System shall be password protected where user can login only if login ID is provided by administrator. BCS shall have rights management system so that access rights can be provided as per requirement to maintain security.
9.3.3	Database	BCS shall maintain master database according to desired area, location, and region etc.
9.3.4	Reporting	<ul style="list-style-type: none"> a. BCS shall have option of user defined report generation in format of Excel, Word and CSV, XML, PDF etc. b. BCS shall have capability to export data in ASCII, CSV and XML format at desired location so that the same could be integrated with our billing data for processing. c. All the data available in the meter shall be convertible to user

Technical Specification For Three Phase Whole Current Smart Meter

		defined ASCII, CSV and XML file format.
9.3.5	Data transfer rate	BCS and communication ports should support data transfer rate of 9600 bps (minimum).
9.4	Hand Held Unit Software	<ul style="list-style-type: none"> a. The manufacturer has to provide software capable of downloading all the data stored in meter memory through window/ android operating system based handheld units (HHU) through optical port. b. In the event of order, bidder shall work with BYPL IT team/ BYPL designated system integrator to develop HHU software for meter downloading and further uploading on HES. c. HHU software should have option for selection of parameters to be downloaded from meter. d. Meter data consisting of all parameters and complete load survey for all parameters shall be read by HHU and downloaded on HES in minimum possible time (not more than 5 minutes).
9.5	Training	Manufacture shall impart training to BSES personnel for usage of software

10.0 Name Plate

10.1	Meter Serial number shall be of 8 digits. Serial number shall be printed in black colour. Embossing is not acceptable.
10.2	Size of the digit shall be minimum 5X3 mm
10.3	Bar code shall be printed along with serial number
10.4	BIS registration mark (ISI mark)
10.5	'BSES' insignia shall be printed above LCD display.
10.6	BSES PO No. & date
10.7	Manufacturers name and country of origin
10.8	Model type / number of meter
10.9	Month and Year of manufacturing
10.10	Reference voltage / current rating
10.11	The number of phases and the number of wires for which the meter is suitable. Graphical symbol as per IS 12032 can be used.
10.12	Meter constant
10.13	Class index of meter
10.14	Reference frequency
10.15	Warranty period
10.16	Symbol of load switch
10.17	Name plate of NIC <ul style="list-style-type: none"> a. Serial no of NIC along/ IMEI no/MAC address with bar code b. Name of purchaser's c. Communication technology with carrier frequency d. Manufacturing year and month. e. Warranty period.

Technical Specification For Three Phase Whole Current Smart Meter

11.0 Component Specification

11.1	Current Transformers	The Meters should be with the current transformers as measuring elements.	The current transformer should withstand for the clauses under 5.18(t)
11.2	Shunt element	Data sheet should be submitted.	Reputed
11.3	Measurement or computing chips	The Measurement or computing chips used in the Meter should be with the Surface mount type along with the ASICs.	Analog Devices, Cyrus Logic, Atmel, Phillips, SAMES ,NEC,TEXAS
11.4	Memory chips	The memory chips should not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	Atmel, National Semiconductors, Texas Instruments, Phillips, ST, Hitachi, Compiled
11.5	Display modules	a) The display modules should be well protected from the external UV radiations. b) The construction of the modules should be such that the displayed quantity should not disturbed with the life of display (PIN Type). c) It should be STN type industrial grade with extended temperature range min 70 °C.	Truly semiconductor, Tianma / Haijing Electronics, China, Hitachi,
11.6	Optical port	The mechanical construction of the port should facilitate the data transfer. Communication shall not disturbed by external light.	Everlight, Osram, Agilent, NFC
11.7	Power Supply	The power supply should be with the capabilities as per the relevant standards. The power supply unit of the meter should not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
11.8	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. The PTH components should be positioned such a way that the leads of components should not be under stress and not touching the internal wires.	National Semiconductors, Atmel, Phillips, Texas Instruments. Hitachi, Compiled, AVX or Ricoh Samsung, EPCOS, Vishay
		LED	Everlight, Agilent
11.9	Mechanical parts	a) The internal electrical components should be of electrolytic copper & should be protected from corrosion, rust etc. b) The other mechanical components should be protected from rust, corrosion etc. by suitable plating/painting methods.	

Technical Specification For Three Phase Whole Current Smart Meter

11.10	Battery	Lithium with guaranteed life of 15 years	Texcell, SAFT, Varta
11.11	RTC & Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	Philips, Dallas Atmel, Motorola, Microchip, TEXAS, NEC or Compiled
11.12	P.C.B.	Glass Epoxy, fire resistance grade FR4, with minimum thickness 1.6 mm	(BBT test is must)
11.13	Load Switch	Utilization Category UC2/ UC3 Latching relay Can withstand 120% of Vref and 120% of I _{max} current. As per IS 15884	Gruner
11.14	Note	<ul style="list-style-type: none"> a. The components used by manufacturer shall have "Minimum Life" more than the 10 years. b. In case vendor want to use other make components; same shall be approved by BSES before use. c. Even for existing supplier – fresh approval is needed for all deviations. d. Manufacturer should have complete tracking of material used in meter. BSES reserve the right to carry out audit of inventory/ manufacturing process at manufacturer's works and sub vendor's work. 	

12.0 Quality Assurance, Inspection and Testing

12.1	Vendor's Quality Plan (QP)	To be submitted for Purchaser's approval.	
12.2	Sampling Method	Sampling Method for quality checks shall be as per relevant IS/ IEC/ CBIP guidelines and Purchaser's prior approval shall be taken for the same.	
12.3	Inspection Hold- Points	To be mutually identified, agreed and approved in Quality Plan.	
12.4	Type Tests	<ul style="list-style-type: none"> a. The meter shall be of type tested quality including all tests specified in this specification which are beyond IS / IEC or CBIP. b. Type test conducted from CPRI/ ERDA/ or any other lab specified by BIS/ CEA for smart meter testing will be treated as valid. c. Type test certificate should be submitted along with offer for scrutiny. d. Any other component supplied in addition to meter shall also be type tested as per IS /IEC if applicable. e. Complete type test as per IS 16444 (Part 1) shall be carried out on sample selected from BSES lot. 	
12.5	Routine tests	All test marked "R" as per table 20 of IS 13779.	
12.6	Acceptance Tests	<ul style="list-style-type: none"> a. All tests marked "A" as per table 20 of IS 13779. b. Smart meter functional tests as per IS 16444 Table 1 c. Test of load switch as per clause 10.4 of IS 16444 (Part 1) d. Test for data exchange protocol as per clause 10.5 of IS 16445. e. Test for Smart meter communicability as per clause no. 10.6 of IS 16444 (Part 1). f. All the routine and acceptance tests shall be carried out as per relevant standards. 	

Technical Specification For Three Phase Whole Current Smart Meter

		<p>g. Following tests in addition to IS shall be conducted during lot inspection.</p> <ul style="list-style-type: none"> I) Dimensional and drawing verification. II) Display parameters/ sequence. III) Data Downloading from CMRI and PC. IV) Tamper/ fraud detection/logging features as per approved documents. Tamper conditions will be simulated at varying load up to I_{max}. Accuracy will also be checked during tamper simulation. V) Burn in chamber test. VI) Component verifications. <p>h. Purchaser reserves the right to formulate any other test method to verify guaranteed parameters of Meter.</p>
12.7	ESD and Magnetic Interference test	ESD and magnetic interference test will be conducted at Samir lab, Chennai or CPRI.
12.8	Inspection	<ul style="list-style-type: none"> a. Purchaser reserves the right to inspect /witness all tests on the meters at Seller's works at any time, prior to dispatch, to verify compliance with the specification/ standards. b. Manufacturer should have all the facilities/ equipments to conduct all the acceptance tests as per clause 15.3 relevant standards and tampers logics as per approved GTP. All the equipments including tamper logs kits/ jigs should be calibrated. c. In-process and / or final inspection call intimation shall be given in advance to purchaser.

13.0 Packing, Marking, Shipping, Handling and Storage

13.1	Packing	<ul style="list-style-type: none"> a. Each meter must be packed, together with its terminal cover, in a separate environmental friendly cardboard box, which can be opened and re-closed without needing adhesives. b. Up to 4 to 5 three-phase meters must be packed together with their terminal covers in a group cardboard box, which can be opened and re-closed without needing adhesives. c. The box shall prevent, as much as possible, penetration of dust during long storage periods. The box must be designed for multiple use and be robust, with wall thickness of at least 4 mm. d. Maximum weight of a group meter box shall not be more than 25 Kg. e. The packaging will protect the meters against shock and vibration, preventing damage due to the road conditions during transport and distribution in the field. The electrical and mechanical properties shall not be affected by these disturbances. f. For shipping the boxed meters will be close packed by stockpiles of suitable quantities on pallets. The meters numbers sequence (without partition) shall be kept in each pallet. A pallet will be protected against moisture by a polyethylene hood, covered with a cardboard cover (hood), and fixed onto the pallet by parallel polypropylene bands, using protection angle bars at the corners. The hood shall be marked – on the front (wide side), on the narrow side and on the top as per clause 13.3. g. Each pallet should contain between 70 and 300 meters. The
------	---------	---

Technical Specification For Three Phase Whole Current Smart Meter

		<p>actual number of meters on each pallet will be agreed with the BSES in the event of order.</p> <p>h. An impact detector ("Shock-Watch") label shall be attached to the cardboard hood of several pallets in each container/ transport truck, to warn of possible rough handling during shipment, transport and storage.</p>
13.2	Packing for accessories and spares	Robust wooden non returnable packing case with all the above protection & identification Label.
13.3	Marking	<p>On each group box and pallet, following details are required both on front (wide side) and top:</p> <ul style="list-style-type: none"> a. BSES logo. b. Meter serial number range along with bar code. c. Unique number of box/ pallet. d. Purchaser's name e. PO number (along with SAP item code, if any) & date with bar code f. Equipment Tag no. (if any) g. Destination h. Manufacturer / Supplier's name i. Address of Manufacturer / Supplier / it's agent j. Type , rating and other description of equipment k. Country of origin l. Month & year of Manufacturing m. Case measurements n. Gross and net weights in kilograms o. All necessary slinging and stacking instructions
13.4	Test reports	Routine test report to be provided with each meter
13.5	Shipping	The seller shall be responsible for all transit damage due to improper packing.
13.6	Handling and Storage	Manufacturer instruction shall be followed. Detail handling & storage instruction sheet /manual to be furnished before commencement of supply.

14.0 Deviations

14.1	Deviations	<ul style="list-style-type: none"> a. Deviations from this specification can be acceptable, only where the Seller has listed in his quotation the requirements he cannot, or does not, wish to comply with and which deviations the Buyer has agreed to in writing, before any order is placed. b. In the absence of any list of deviations from the Seller, it will be assumed by the Buyer that the Seller complies with the Specification fully.
------	------------	---

15.0 Drawing Submission

Drawing submission shall be as per the matrix given below. All documents/ drawing shall be provided on A4 sheet in box file with separators for each section. Language of the documents shall be English only. Deficient/ improper document/ drawing submission may liable for rejection

SL	Detail of Document	Bid	Approval	Pre Dispatch
1	Guaranteed Technical particulars (GTP)	Required	Required	
2	Deviation Sheet, if any	Required	Required	

Technical Specification For Three Phase Whole Current Smart Meter

3	Tamper Sheet	Required	Required	
4	Display Parameters	Required	Required	
5	GA / cross sectional drawing of Meter showing all the views / sections	Required	Required	
6	Detail of network interface i.e. pin out, standard, voltage level etc and its integration requirement.	Required	Required	
7	Samples of each type and rating offered along with box and RF NIC/ communication module of already integrated RF card as per tender qualifying criteria.	4 no's (2 nos with box and 2 nos without box)	2 no's (01 no with box and 01 no without box)	
8	Any software and accessories required for installation/ operation of meter	Required	Required	
9	Manufacturer's quality assurance plan and certification for quality standards	Required		
10	Type Test reports of offered model/ type/ rating	Required		
11	BIS certificate	Required		
12	Complete product catalogue and user manual.	Required		
13	Customer Reference List	Required		
14	Recommended list of spare and accessories	Required		
15	Specification documents containing all parameters, Services, Methods in addition to companion specification of IS 15959 (part 2).		Required	
16	Program for production and testing (A)		Required	Required
17	Makes of components		Required	Required
18	Detailed installation and commissioning instructions		Required	Required
19	As Built Drawing		Required	Required
20	Operation and maintenance Instruction as well as trouble shooting charts/ manuals		Required	Required
21	Inspection and test reports, carried out in manufacturer's works			Required
22	Routine Test certificates			Required
23	Test certificates of all bought out items			Required
24	Meter Seal data			Required
25	Mapping of meter serial no to Communication card.			Required

16.0 Delivery

16.1	Delivery	Despatch of Material: Vendor shall despatch the material, only after the Routine Tests/Final Acceptance Tests (FAT) of the material witnessed/waived by the Purchaser, and after receiving written Material Despatch Clearance (MDC) from the Purchaser.
------	----------	--

Technical Specification For Three Phase Whole Current Smart Meter

Annexure- A- Guaranteed Technical Particulars

Bidder shall furnish the GTP format with all details against each clause of this specification.
 Bidder shall not change the format of GTP or clause description.
 Bidder to submit duly filled GTP in hard copy format with company seal.

Clause No.	Clause Description	Manufacturer's Reply
1		
2		
3		
4		
5		

Bidder / Vendor seal / signature -----

Name of the bidder	
Address of the bidder	
Name of contact person	
Telephone number and email id	

Annexure - B- Recommended Accessories / Spares

SL	Description of spare part	Unit	Quantity
1		No	
2		No	
3			

Annexure - C- Integration Requirement of Meters with NIC and HES

Integration requirements with communication provider of BYPL/ any other agency designated by BYPL for other components of AMI.

- a. Bidder(s) must share the meter security keys, all level encryption, and password information along with asset information in a format with the buyer / communication provider of BYPL so that during AMI business flow, the device and data can be authenticated all the time.
- b. Bidder(s) must share the details of meter communication specifically programmed protocols.
- c. Bidder(s) must share the meter configuration source code to the BYPL/ communication provider of BYPL.
- d. Bidder (s) must share the meter interface touch points for external applications/ systems.
- e. Bidder(s) must share the required APIs including but not limited to reading APIs, configuration APIs and Functional APIs with the System Integrator for execution of business flow (Installation, reading, configuration).
- f. Bidder(s) must share the data storage and retrieval details.
- g. Bidder(s) must configure the devices to be upgraded remotely (OTA) and share the required firmware source code (with updates over the project life) with system integrator as and when it is required in case of feature request or fault correction.
- h. Bidder(s) must follow and conduct Utility's sample and periodic test program, including (but not limited to) the selection of a sample population of meters, sharing of sample test results as reported by the meter testing systems with the system Integrator.
- i. Bidder(s) must share the information related to communication module for the authorization purpose at to BYPL/ communication provider of BYPL.

Technical Specification For Three Phase Whole Current Smart Meter

Annexure- D- Tamper and Fraud Detection Events

1. Voltage Related Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
R Phase Voltage Missing (Occurrence/ Restoration)	Absence of potential on any phase should be logged. Restoration of normal supply shall also be recorded. The threshold value of voltage should be programmable at factory end	Occurrence: If $V_{pn} < 10\% V_{ref}$ and $I_p > 10\% I_b$ Restoration: If $V_{pn} \geq 10\% V_{ref}$ and $I_p > 10\% I_b$	Occurrence: 5 Min Restoration: 5 Min
Y Phase Voltage Missing (Occurrence/ Restoration)			
B Phase Voltage Missing (Occurrence/ Restoration)			
Over Voltage (occurrence/ restoration)	Meter should log high voltage event if voltage in any phase is above a threshold value.	Occurrence: If $V_{pn} > 10\% V_{ref}$ Restoration: If $V_{pn} \leq 10\% V_{ref}$	Occurrence: 5 Min Restoration: 5 Min
Low Voltage (occurrence/ Restoration)	Meter should log low voltage event if voltage in any phase is below a threshold value. Threshold value if factory programmable.	Occurrence: If $V_{pn} < 75\% V_{ref}$ Restoration: If $V_{pn} \geq 75\% V_{ref}$	Occurrence: 5 Min Restoration: 5 Min
Voltage Unbalance (Occurrence/ Restoration)	Meter should log voltage imbalance event when the difference between minimum and maximum phase voltage is more than a threshold value. Threshold value if factory programmable.	Occurrence: If $V_{max} - V_{min} > 30\% V_{ref}$ Restoration: If $V_{max} - V_{min} \leq 30\% V_{ref}$	Occurrence: 5 Min Restoration: 5 Min
R Phase voltage Harmonics	Meter should log occurrence of high voltage harmonic event when % THD in voltage of phase will be more than threshold value. Threshold value should be factory	Occurrence: If % THD in $I_p > 5\%$ of fundamental. Restoration: If % THD in $I_p < 5\%$ of fundamental.	Occurrence: 5 Min Restoration: 5 Min
Y Phase Voltage Harmonics			
B Phase Voltage Harmonics			
2. Current Related Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Current Reverse/ R Phase Current Reverse (occurrence/ Restoration)	Meter should log the event of reversal of C.C polarity. Meter should register energy consumed correctly with any one, two or all three current coils reversed. This event shall not be valid in bidirectional mode of metering.	Occurrence: If $I_p = -ve$ direction Restoration: If $I_p = +ve$ direction	Occurrence: 5 Min Restoration: 5 Min
Y Phase Current Reverse (occurrence/ Restoration)			
B Phase Current Reverse (occurrence/ Restoration)			
R Phase Current Open (Occurrence/	Meter should log the event of current coil open. Threshold	Vector $\text{Sum}(I_R + I_Y + I_B + I_N) > 20\% I_b$	Occurrence: 5 Min Restoration: 5 Min

Technical Specification For Three Phase Whole Current Smart Meter

Restoration)	value of current should be programmable at factory end.	and $I < 10\% I_b$ Vector $Sum(I_R + I_Y + I_B + I_N) > 20\% I_b$	
Y Phase Current Open (Occurrence/Restoration)			
B Phase Current Open (Occurrence/Restoration)			
Current Unbalance (Occurrence/Restoration)			
Current Bypass (Occurrence/Restoration)	Meter should log the event of current coil shorting/bypass. Threshold value of current should be programmable at factory end.	Vector $Sum(I_R + I_Y + I_B + I_N) > 20\% I_b$ and I (any Phase) $> 5\% I_b$ Vector $Sum(I_R + I_Y + I_B + I_N) > 10\% I_b$	
Over current (occurrence/restoration)	If the current in any phase exceeds the specified threshold current, meter should log over current event.	Occurrence: If $I_p > I_{max}$ Restoration: If $I_p \leq I_{max}$	Occurrence: 5 Min Restoration: 5 Min
R Phase high Current Harmonics	Meter should log occurrence of high current harmonic event when % THD in current of phase will be more than threshold value. Threshold value should be factory	Occurrence: If % THD in $I_p > 5\%$ of fundamental. Restoration: If % THD in $I_p < 5\%$ of fundamental.	Occurrence: 5 Min Restoration: 5 Min
R Phase high Current Harmonics			
R Phase high Current Harmonics			
3. Power Related Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Power OFF (occurrence/restoration)	Meter shall detect power OFF if all phase voltages are absent. This event shall be recorded at the time of each power OFF. At the same time power ON event shall be recorded.		
Abnormal Power Off (Occurrence/restoration)	If meter micro detect power off whereas phase voltage is present than abnormal power will be recorded. Meter shall continue to record energy as per phase voltage and current.	Occurrence: If voltage at meter power supply $< 10\% V_{ref}$ and $V_p > 20\% V_{ref}$. Restoration:	NA
4. Other Events:			
Description of event	Logic Of Event	Logic Expression/ Threshold values	Persistence Time
Abnormal External Magnetic Influence (Occurrence/Restoration)	a. Meter should either be immune or should log the events of attempt of tampering by external magnetic field as per relevant IS13779/ CBIP 325 with latest amendments. b. If the working of meter gets affected under the	As per IS 13779/ CBIP 325	As per IS 13779

Technical Specification For Three Phase Whole Current Smart Meter

	influence of external magnetic field, meter should record energy at I _{max} . Meter should not compute MD during this period. The meter shall record energy as per actual load once the magnetic field is removed.		
Neutral Disturbance- HF, DC and Alternating (occurrence/ restoration)	Meter should log the event when AC/DC/ Pulsating voltage is injected in neutral circuit.	As per manufacturing standard.	Bidder shall define threshold values
Low Power Factor	Meter shall able to detect and log the low PF event if power factor of the load found between 0.2 to 0.5 for a load above than a % thershold value for a thershold time value. Event shall restore if PF factor of load remain out of range 0.2 to 0.5 for a load ablove than % thershold value for		
Plug in Communication module removal (Occurrence/ Restoration)	Meter should log the removal of communication card. Meter should also log insertion of communication card.	By NC switch/ sensor	
Configuration change to post-paid mode/ pre-paid mode	Meter should log the change in payment mode configuration.		
Configuration change to "Forwarded" only mode/ "Import and Export" mode	Meter should log the change in metering mode configuration.		
Overload (Occurrence/ Restoration)	Meter should able to log the status of overload in KW		
HV Spark (Occurrence/ restoration)/ Jammer	Meter with communication card should be immune or log the event in the case of application of ESD upto and including 35 KV.	Immediately	NA
High neutral Current	Meter should log event of high neutral current if measured neutral current should be more than predefined threshold value.	Occurrence: If $I_N > 50\%$ of average phase current Restoration: If $I_N < 50\%$ of average phase current	Occurrence: 5 Min Restoration: 5 Min
Distorted PF	Meter shall log the event if difference between displacement PF and actual PF is more than a predefined value		Occurrence: 5 Min Restoration: 5 Min

Technical Specification For Three Phase Whole Current Smart Meter

Time Based Event Stamp	Meter shall log voltage, current, PF and energy consumption on a predefined time	As per predefined time	NA
5. Non Roll over events:			
Event Description			
Occurrence of cover open			
6. Transaction Related Events:			
Detail of Transaction			
Real Time Clock- Date and Time			
Demand Integration Period			
Profile Capture Period			
Single Action schedule for billing date			
Activity calander for time zones			
New firmware activated			
Load Limit (Kw) Set			
Enable Load Limit Function			
Disable load limit function			
LLS secret (MR) change			
HLS key (US) change			
HLS key (FW) change			
Global key change			
ESWF change			
MD reset			
7. Control Events			
Event Description			
Load Switch Status- Disconnected			
Load Switch Status- Connected			

Note:

1. Event ID's shall be defined as per BYPL specification/ IS 155959 (part 2). Approval shall be taken from BYPL prior to manufacturing for Event ID's
2. Programming of threshold values should be possible from remote via proper authentications.
3. Logics of tampers can be changed/ upgraded via firmware up gradation from remote via proper authentication.
4. All the programming changes/ firmware up gradations shall be logged along-with date and time stamp in meter as well as on HES.

Technical Specification For Three Phase Whole Current Smart Meter

Annexure -E- Meter Enclosure

SL	Clause	Clause Description
1.0	Meter Box Type	Flush type with Completely transparent top cover and base with Incoming and Outgoing cable entry and data downloading arrangement.
2.0	Design	Meter box shall comply following requirement.
2.1	General Requirement	The meter box shall be designed in such a way that no access to the meter body, terminals and hardwired port of the meter shall be possible after installation and sealing of the box without breaking the box itself.
2.2	Theft Protection	<ul style="list-style-type: none"> a. Meter box shall be theft proof i.e. meter box cannot be opened without breaking the seals or meter itself. b. On breaking of the box, clear evidence of the physical tempering shall be visual.
2.3	Parts of the box	<ul style="list-style-type: none"> a. The meter box shall be designed in 02 parts i.e. base and top cover. b. Meter shall be mounted inside the base on fixed moulded pillars by unidirectional screw. c. Meter top cover should be hinge type. d. Cable glands and earthing bolt shall be provided at the base as per construction requirement. e. Proper stiffeners shall be provided in the body of the base and top cover to provide mechanical strength against transportation and installation vibrations.
2.4	Ingress protection	The meter box shall be completely dust and vermin proof. Ingress protection rating of the box shall be minimum IP55.
2.5	Collar of base and cover	<ul style="list-style-type: none"> a. A 'U' shaped groove shall be provided in the collar of the base body, in which UV stabilized rubber 'O' shall be installed. The design of lining shall be such that it provides proper sealing between the cover & base of box to avoid penetration of dust and ingress of water. b. All around projection provided inside the cover periphery which keeps the 'O' ring pressed. c. An outside collar shall also be provided, which shall cover outer surface of the collar.
2.6	Fixing of 'O' ring	<ul style="list-style-type: none"> a. Rubber 'O' Ring should be fixed with suitable adhesive so that the same does not get removed. b. Rubber 'O' ring shall be fixed in a single piece without any gap between open ends. Open end of the 'O' ring shall be provided at the bottom side only.
3.0	Material	The material shall be as follow:
3.1	Box material	<ul style="list-style-type: none"> a. The material of meter box shall be flame retardant with inflammability level V0 having good dielectric and mechanical strength. b. The top Cover and Base of the box shall be made out of transparent polycarbonate with minimum 90% visibility so as to ease installation and monitoring of box against any tampering. The material shall be 'UV' stabilized to ensure that the moulded meter box should not change in colour, shape, size or should not get brittle after exposure to UV rays.
3.2	Hardware	All the metal hardware including hinges, U latches, mounting screws, downloading port ring etc shall be of rust proof stainless steel.

Technical Specification For Three Phase Whole Current Smart Meter

SL	Clause	Clause Description
3.3	Cable glands	Polyamide Nylon-66 with flammability class FV0
4.0	Construction	<ul style="list-style-type: none"> a. Meter box shall be constructed by moulding of polycarbonate material as specified in clause no. 3.1 b. Thickness of meter box shall be minimum 2.0 mm.
4.1	Moulding	The box shall be made through Injection Moulding or better method.
4.2	Base	Meter shall be factory fitted inside base body using unidirectional screws, on fixed mounting pillars, moulded in to the base of sufficient strength, so that removing of meter shall not possible without breaking the meter box or meter itself.
4.3	Top cover	Hinge type
4.3.1	Hinge type	<ul style="list-style-type: none"> a. Minimum 02 no's concealed / internal hinges, not visible or accessible from outside the box without breaking the box itself. b. Minimum 02 no's U latches shall be provided to closed the box with sealing arrangement at each U latch. c. After closing the U latches no play/ gap shall exist between base and top cover.
5.0	Padlocking	The box shall also have padlocking facility.
6.0	Cable entry	<ul style="list-style-type: none"> a. 02 no's as incoming and outgoing at the 45 Deg Chamfer bottom corners suitable for 4CX50 Sqmm armoured aluminum cable. b. Cable entry must be at the bottom diagonal ends of the meter box. Appropriate clearance shall be provided between the cable entry and position of meter terminals for proper cable bending and connection. c. Minimum 60 mm vertical space shall be provided from the terminals of meter to centre of cable gland to provide sufficient bending radius and working space.
6.1	Cable Gland	<ul style="list-style-type: none"> a. Two nos. of Elbow shaped glands made out of Polyamide Nylon-66 suitable for 4CX25 / 2CX50 sqmm aluminium armoured cable shall be provided on both cable entries in the box. b. Glands shall be designed in such a manner that the same cannot be unscrewed / removed from the box from outside. Manufacturer may either supply two nos. of check nuts or any other alternate design to meet this requirement.
7.0	Earthing bolt	<ul style="list-style-type: none"> a. Earthing bolt of M6 with nut and washer shall be provided on left side of the body of meter box. b. The arrangement shall be such that one earth point shall be available for customer and external earthing provided by BSES can be terminated. c. Necessary symbol shall be provided for earth terminal.
8.0	Mounting	Mounting arrangement shall be as follow
8.1	Meter mounting pillars	<ul style="list-style-type: none"> a. Fixed type, moulded in to the base body as per the requirement of meter mounting holes. b. Stiffeners shall be provided at the base of the mater mounting pillars.
8.2	Meter box mounting	<ul style="list-style-type: none"> a. Four (4) nos. fixing holes of 6 to 6.5 mm diameter at the back surface of box shall be provided to fix the same on flat wall. b. Mounting holes shall not be obstructing by Incoming or Outgoing cables.
8.3	Box Mounting spacers	04 no's, 25 mm minimum mounting spacer moulded at the mounting holes of back surface of the meter box in order to provide space between meter back surface and wall.

Technical Specification For Three Phase Whole Current Smart Meter

SL	Clause	Clause Description
8.4	Box Mounting accessories	Long pan head self tapping SS screws and washers shall be provided by the supplier with every box. 4 no's plastic fixing plugs suitable for self tapping screws shall also be provided.
9.0	Data Downloading arrangement	<ul style="list-style-type: none"> a. Option 1: <ul style="list-style-type: none"> a. Slot for optical head with non removable corrosion ferromagnetic metal ring. b. Data downloading shall not be affected by scratches on data downloading port or with ageing of box. c. Data downloading shall not be affected by visible light conditions. b. Option 2: <ul style="list-style-type: none"> a. DB9 RS232 connector shall be provided at the top cover of box to download meter as specified in clause no. 9.1 b. Meter shall be downloadable without opening of the box/ breaking of seals. c. This arrangement shall not de-rate the IP rating of meter box. d. A Top hinges and bottom sealable cover shall be provided on the data downloading slot. e. Data downloading shall not be affected by visible light conditions.
9.1	Optical to RS232 cable (If option 2 as per clause no. 9.0	Optical reader with 9 pin D-type female connector cable shall be provided in each meter box. Push fit type protective cover with sealing arrangement for data downloading port on the cover of the meter box has to be provided. The optical meter reader with 9 pin D-type female connector cable of all the meter boxes (100%) shall be tested for meter downloading before dispatch.
10.0	Marking	<p>Following marking shall be provided on both top cover and base by indiligible laser printing/ screen printing or embossed from inside of the box.</p> <ul style="list-style-type: none"> a. BSES insignia shall be embossed on the base & cover of meter box. b. Meter serial no. (Both on base and cover of meter box) c. Purchaser's PO no. and date. d. Purchaser's Name. e. Name or trade mark of seller f. Any other detail required at the time of approval.

SECTION - VI

FORMATS

Single Phase and Three Phase Smart meter with HES Prepaid
Engine and SIM card

NIT : CMC/BY/18-19/RB/VKS/041

Dated : 08.08.2018

Annexure -I

BID FORM

To
Head of the Department
Contracts & Materials
BSES Yamuna Power Ltd
Shakti Kiran Building, Karkardooma
New Delhi- 110032
Sir,

1. We understand that BYPL is desirous of carrying out In its license distribution network area in Delhi.
2. Having examined the Bidding Documents for the above named works, we the Undersigned, offer to provide our services in full conformity with the Terms and Conditions and technical specifications for the sum of..... (figures.....) or such other sums as may be determined in accordance with the terms and conditions of the contract .The above Amounts are in accordance with the Price Schedules attached herewith and are made part of this bid.
3. If our Bid is accepted, we undertake to provide our services as per completion schedule mentioned in the tender document from the date of award of work order/letter of intent.
4. If our Bid is accepted, we will furnish a performance bank guarantee as mentioned in the RFQ for due performance of the Contract in accordance with the Terms and Conditions.
5. We agree to abide by this Bid for a period of 120 days from the due date of bid submission and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. Unless and until Letter of Intent is issued, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
7. We understand that you are not bound to accept the lowest, or any bid you may receive.
8. There is provision for Resolution of Disputes under this Contract, in accordance with the Laws and Jurisdiction of Contract.

Dated this..... day of..... 20.....
Signature..... In the capacity of
.....duly authorized to sign for and on behalf of
(IN BLOCK CAPITALS)

BID SUBMISSION FORM

Offer No.:

Date:

To,

Head Contract and Material
BSES YAMUNA POWER LIMITED
3rd Floor “A” Block, Shakti Kiran Building,
Delhi-110032 (INDIA).

Dear Sir,

In response to your Tender No. CMC/BY/18-19/RB/VKS/041 for Supply of Single Phase and Three Phase Smart meter with HES Prepaid Engine and SIM card for BSES YAMUNA POWER LTD, Delhi-32. We hereby submit our offer herewith.

- 1. Bidder Name :
- 2. Website Address :
- 3. Email Address :
- 4. Address for Communication :

5. Telephone Number :

6. Fax/Telefax Number :

7. Authorized Person for Technical Queries -

Name :

a. Designation:.....

b. Mobile No. :

c. Email-ID :

8. Authorized Person for Commercial/R-Auction Queries -

Name :

a. Designation:.....

b. Mobile No. :

c. Email-ID :

9. PAN Number :

10. TIN Number :

11. Service Tax Regn. No. :

12. ECC Number :

13. GST Number :

14. Particulars of EMD

- a. Amount : Rs.
- b. Mode of Payment (BG) :
- c. BG No. :
- d. Date :
- e. Name of the Bank :
- f. Address of the Bank :
- g. Validity of BG :

15. Particulars of Tender Fee

- a. Amount : Rs.
- b. DD No. :
- c. Date :
- d. Name of the Bank :
- e. Address of the Bank :

16. Turnover of the Bidder in last 3 years (Please submit copy of Annual Report)

Year	Annual Report attached at Page No.	Turnover in Rs. (Crores)
2014-2015		
2015-2016		
2016-2017		
Average Turnover		

17. Details of similar work / order executed during last 2 years (Please submit copy of completion certificate from the client).

Description of the Work/ Order Executed	Value of Work/Order Executed	Name of the Client	Start Date	Finish Date	Doc. Evidence at Page No.

18. Following Documents are submitted to substantiate other eligibility criteria.

- i)
- ii)
- iii)

DECLARATION

- 1) We have read and understood the terms & conditions of the above mentioned tender and comply with all Terms & Conditions of your Tender.(In case of any deviation the Bidder must attach a separate sheet clearly mentioning the Clause No. of the Tender and Deviation thereto)
- 2) We certify that the information mentioned above are true and correct to best of our Knowledge.
- 3) In case of receipt of order we confirm that payment shall be received through e-Banking / Electronics Transfer.
- 4) This offer contains No. of pages including all Annexure and Enclosures.

Place:
Date:

Signature of Authorized Signatory

Name:

Designation:

Seal:

FORMAT FOR BID SECURITY BANK GUARANTEE

(To be issued in a Non Judicial Stamp Paper of Rs.100/-purchased in the name of the bank)

Whereas [name of the Bidder](hereinafter called the Bidder“) has submitted its bid dated [date of submission of bid] for the supply of [name and/or description of the goods] (hereafter called “the Bid”).

KNOW ALL PEOPLE by these presents that WE [name of bank]at[Branch Name and address],having our registered office at[address of the registered office of the bank](herein after called – the Bank“),are bound unto BSES Yamuna Power Ltd., with it’s Corporate Office at BSES Building Karkardooma, New Delhi -110032 ,(herein after called – the Purchaser“)in the sum of Rs.(Rupees.....only) for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents.

Sealed with the Common Seal of the said Bank this ____ day of _____ 20 ____.

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form ;or
2. If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:
 - (a) Fails or refuses to execute the Contract Form , if required; or
 - (b) Fails or refuses to furnish the performance security, In accordance with the Instructions to Bidders/Terms and conditions;

We undertake to pay to the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that is its demand the purchaser will note that amount claimed by it is due to it, owing to the occurrence of on e or both of the two condition s, specifying the occurred condition or condition s.

This guarantee will remain in force up to and including One Twenty (120) days after the due date of submission bid, and any demand in respect thereof should reach the Bank not later than the above date.

(Stamp & signature of the bank)

Signature of the witness

Annexure -III**ACCEPTANCE FORM FOR PARTICIPATION IN REVERSE AUCTION EVENT**

(To be signed and stamped by the bidder prior to participation in the auction event)

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

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

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

Signature & seal of the Bidder

PRICE FORMAT

Tender No: CMC/BY/18-19/RB/VKS/041

Dated: 08.08.2018

Smart Pre-Paid Meter & Software (Part A)

S.No	ITEM DESCRIPTION	QTY AS PER RFQ	UOM	EX-WORKS PRICE/PC	FREIGHT	GST %	GST Amt	LANDED COST/PC	TOTAL LANDED COST IN (INR)
1	SUPPLY OF MTR,ENERGY,10-60A,1PH,SMART PREPAID	10000	Nos						
2	SUPPLY OF IPH SMART METER BOX	10000	Nos						
3	SUPPLY OF MTR,ENERGY,20-80AMP,3PH, SMART PREPAID	2000	Nos						
4	SUPPLY OF 3PH SMART METER BOX	2000	Nos						
5	HES Prepaid Engine/ MDAS software	1	EA						
Total									

Meter Installation and SIM cost (Part B)

S.No	ITEM DESCRIPTION	QTY AS PER RFQ	UOM	EX-WORKS PRICE/PC	FREIGHT	GST %	GST Amt	LANDED COST/PC	TOTAL LANDED COST IN (INR)
6	INSTALLATON OF MTR,ENERGY,10-60A,1PH,SMART PREPAID	10000	Nos						
7	INSTALLATION OF MTR,ENERGY,20-80AMP,3PH, SMART PREPAID	2000	Nos						
8	SIM card (Cost should be Per SIM/Per Year)	12000	EA						
Total									

Annual Maintenance Cost (AMC) Part C

S.No	ITEM DESCRIPTION	QTY AS PER RFQ	UOM	EX-WORKS PRICE/PC	FREIGHT	GST %	GST Amt	LANDED COST/PC	TOTAL LANDED COST IN (INR)
9	Annual Maintenance cost for 12000 meters, (entire system including HES, Troubleshooting issues, meter communication issues etc.	1	Lot						
10	Incremental in nos. Lot size of 12,000	1	Lot						
	Total								

NAME OF BIDDER

Note:

- i. All tenders with incomplete or incorrect information or not meeting prescribed conditions are liable to be rejected.
- ii. The quantities mentioned in BOQ are for evaluation purpose only, payments shall be made as per actual supply. BYPL reserves right to change the quantities as per requirement and take deliveries in lots.
- iii. The bidder shall also quote for meter installation cost separately; however meter installation may or may not be in scope and will be decided during final award of contract. BYPL reserves right to carry out meter installation by any third party.
- iv. Replacement of defective smart pre paid meters, SIM, resealing of smart pre paid meters/ box due to communication error etc shall be in scope of meter installation agency.
- v. All the tool and tackles such as screw drivers, drills, crimping tools (Hand/ hydraulic), cable strippers/ cutters, knives, wrenches, pliers, hacksaw, torch, PVC taps, line testers, multi meters, communication testing tools etc shall be in scope of meter installation agency.

COMMERCIAL TERMS AND CONDITIONS

S/NO	ITEM DESCRIPTION	AS PER BYPL	CONFIRMATION OF BIDDER/BIDDER terms
1	Validity of prices	120 days from the date of offer	
2	Price basis	a) Firm, FOR Delhi store basis. Prices shall be inclusive of all taxes & duties, freight up to Delhi stores. b) Unloading at stores shall be in vendor's scope c) Transit insurance in BYPL scope	
3	Payment terms	As per Section -III, Clause no. 10	
4	Delivery schedule	Within 2 month from the date of ordering/LOI	
5	Defect Liability period	The Defect liability period shall be 60 months from the date of commissioning or 66 months from the date of delivery whichever is earlier.	
6	Penalty for delay	0.5% of the basic (ex-works) PO value per week of delay or part thereof, subject to maximum of (Ten) 10% of the total basic (ex-works) PO value of undelivered units.	
7	Performance Bank Guarantee	Performance Bank Guarantee for an amount of 5% (Five percent) of the Contract Price in accordance with the format provided in Vol -II, Annexure -II of the bidding documents. The Performance Bond shall be valid for a period of Sixty months (60) from the date of the commissioning or Sixty six months (66) from the date of receipt of material (last consignment) at site/stores whichever is earlier plus 3 months towards claim period.	
8	Reverse Auction Event	In a bid to make our entire procurement process more fair and transparent, BYPL intends to use the reverse auctions through SAP-SRM tool as an integral part of the entire tendering process. All the bidders who are found as techno commercial qualified based on the tender requirements shall be eligible to participate in the reverse auction event.	

Annexure-VI

NIT NO & DATE : DT:

NO DEVIATION SHEET

SL NO	SL NO OF TECHNICAL SPECIFICATION	DEVIATIONS,IF ANY

SIGNATURE & SEAL OF BIDDER

NAME OF BIDDER

Note: The bidder has to mention all technical deviations in his offer which from the Technical Requirement of this tender in above format. Deviations not mentioned in above but mentioned in any other format or in any other part of the offer document shall not be considered as deviation and the bidder shall be deemed to have accepted our technical requirement without deviation.

SELF DECLARATION FORM

Tender No: CMC/BY/18-19/RB/VKS/041

Dated: 08.08.2018

Sir,

1. I / We, the undersigned do hereby declare that, I / We have never ever been blacklisted and / or there were no debaring actions against us for any default in supply of material/ equipment or in the performance of the contract entrusted to us in any of the Electricity Utilities of India.
2. In the event of any such information pertaining to the aforesaid matter found at any given point of time either during the course of the contract or at the bidding stage, my bid/ contract shall be liable for truncation/ cancellation/ termination without any notice at the sole discretion of the purchaser.

Yours faithfully

Place:

Date:

Signature of the bidder with seal

(This form shall be duly signed by the bidder & submitted along with the original copy of the bid.)

QUALIFICATION CRITERIA

S.no	Qualification Criteria	Description by bidder with qualifying the fulfillment	Documentary Evidence attached page no. detail
1.	The bidder must be a meter manufacturer of static meter.		
2.	The bidder shall either themselves be manufacturers of the equipment offered or accredited representatives of such manufacturers in India or of their Principals abroad with whom they may be having collaboration such accreditation should be at least of one year preferably last year as on date of tender. Authority letter from manufacture shall be attached along with Bid.		
3.	Relevant documents (Joint Venture) in support of the above must be furnished along with undertaking of the manufacturers. If these documents are not furnished along with the tenders the offer will be rejected summarily.		
4.	Bidder should have supplied atleast 5000 meters of each type of required meters in last three years and manufacturer or accredited representatives should have experience of supplying to Electricity Distribution Utility/ Undertaking in India with electronic display.		
5.	Offered meters should be in successful operation since at least last 2 year as on the date of opening of Bid.		
6.	This should be supported by the copies of purchase orders and performance reports from the SEBs/Power Utilities should be Enclosed. Existing supplier with good track record in terms of quality and timely delivery will get preference.		
7.	The bidder must possess valid ISO 9001:2008 certification for meter manufacturing and must possess valid BIS License.		
8.	Firms who are debarred/blacklisted in other utilities in India will not be considered, a undertaking shall be submitted by the bidder.		
9.	The Bidder should have turnover of ₹ 20 Cr in any one of the last three financial years (i.e. 2014-2015, 2015-2016 & 2016-2017) related to metering item only . Bidder should submit report on financial standing such as profit and loss statement, balance sheets for the last three years, along with banker's certificates for turnover of only of metering item only.		
10.	The audited financial statements of accounts for the last three years submitted by bidder shall be evaluated and last year of audited accounts should show positive net worth.		
11.	Bidder should have complete volume of type test reports as per relevant IS from any NBAL accredited lab. The type test report should not be older than 2 years as on the date of opening of tender.		
12.	Manufacturer has to demonstrate and provide the software to acquire data and made available in required format.		

13.	In case of new bidders (not enlisted in BSES), Factory inspection & evaluation may be carried out to ascertain bidder's manufacturing capabilities and quality procedures.		
14.	The manufacturer should have following facility to meet both quality and quantity requirement of supplies. Buyer can audit manufacturer's works for quality checks in event of order.		
14.1	Computerized test bench: The manufacturer should have sufficient Nos of Computerized test benches. The benches should have electronic supply, Isolated CT/ PT system and data should be directly stored in central server.		
14.2	Seal tracking system: The manufacturer has to put both his own seal and BSES seal(s) on the meter. He should have a seal tracking software to ensure tracking of seal and no duplication of seals and meter nos.		
14.3	Meter Burn In system: In order to ensure the reliability of components and that there is no drift in meter accuracy with time; the manufacturer should have burn in facility --- Running meter with load at elevated temperature.		
14.4	Routine test data: During lot acceptance, all routine test data should be made available to inspector. In fact as per BIS, STI all test data should be offered to inspector for verification. Routine test report should be packed with each meter.		
14.5	Test benches: During the lot acceptance, BSES inspector can test up to 5% of offered quantity. The manufacturer should agree to provide all test facility to do so. Further he should allow BSES inspector to check shop floor process. The place of inspection should be clearly marked in tender and same should be well equipped.		
14.6	Test equipments: Since the meters has lot of anti theft features, the manufacturer should have test set up to check the working of all anti theft features. Same should be available during lot inspection; otherwise inspector has a right to withdraw inspection.		
14.7	PCB assembly facility:- The PCB facility should have auto- pick n place machine, in- circuit tester, Protection against static charge/ dust etc.; and process to ensure no corrosion of solden points/ tracks. Incase service is taken from other vendor than bidder shall arrange inspection of facility. The bidder should be taking the service from the vendor since last two years and so far have procured & one million meter PCB from vendor.		

The manufacture should send the compliance of above mentioned parameters in technical offer and has to give an under about no objection to verify his manufacturing facility as a part of tender process.

CHECK LIST

Sno	Item Description	Yes/No
1	INDEX	Yes/no
2	COVERING LETTER	Yes/No
3	Bid FORM (UNORICED) DULY SIGNED	Yes/no
4	Bill of Material (UNPRICED)	Yes/No
5	TECHNICAL BID	Yes/no
6	ACCEPTANCE TO COMMERCIAL TERM AND CONDITIONS	Yes/No
7	FINANCIAL BID (IN SEALD ENVELOPE)	Yes/no
8	EMD IN PRESCRIBED FORMET	Yes/No
9	DEMAND DRAFT OF RS 1000/- DRAWN IN FAVOUR OF	BSES YAMUNA POWER LTD
10	POWER OF ATTORNEY/ AUTHORISATION LETTER FOR SIGNING THE BID	Yes/No