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(A Government of West Bengal Enterprise)
(I T & Communication Cell)
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WBSEDCL
e-TENDER NOTICE

(LOCAL COMPETITIVE BIDDING)

BID DOCUMENT

E-tender for Supply, Installation and Maintenance of Smart Meter with Communication System, Head End System (HES) and Meter Data Management System (MDMS) for AMI Solution in TOTEX Model.

23/07/2024

Chief Engineer,
IT&C Cell

Tender Notice No: WBSEDCL/IT&C/33.10(iv)/ 256 **Dated:** 23.07.24

DISCLAIMER

This e-Tender Document (also referred as "e-Request for Proposal" or "e-RFP") is not an agreement and is not an offer or invitation by WBSEDCL to any Bidder other than one that qualifies based on evaluation of submitted BIDs. The purpose of this tender document is to provide information to the potential Bidders to assist them in responding to this Tender Document. Though this Tender Document is prepared with sufficient care to provide all required information to the potential Bidders, they may need more information than that has been provided. In such cases, the potential Bidders are solely responsible to seek the information required from WBSEDCL, at their own cost. WBSEDCL reserves the right to provide such additional information at its sole discretion. In order to respond to the Tender Document, if required, and with the prior permission of WBSEDCL, the potential Bidder may conduct his own study and analysis, as may be necessary.

WBSEDCL makes no representation or warranty and shall incur no liability under any law, statute, rules or regulations on any claim the potential Bidder may make in case of failure to understand the requirement and respond to the Tender Document. WBSEDCL may, in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information the information in this Tender Document.

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INSTRUCTION TO BIDDER (IB)

IB.1. Introduction:

IB.1.1. WBSEDCL is one of the leading Indian Discom in the State of West Bengal. For commitment towards a continuous improvement, an IT/OT Strategy & Implementation Roadmap for Smart Grid maturity under Smart Grid implementation strategy, Advanced Metering Infrastructure (AMI) is one of the most important initiative where conventional electronic meters are expected to be replaced with smart meters in a phased manner. Treading the journey of making power distribution smarter every day, WBSEDCL desires to leverage the benefits of Advanced Metering Infrastructure for taking power quality and reliability to the pinnacle of excellence.

IB.1.2. West Bengal State Electricity Distribution Company Limited hereinafter referred to as WBSEDCL, a Govt. of West Bengal Enterprise is responsible to distribute uninterrupted and quality Power within the State of West Bengal. WBSEDCL have already implemented AMI systems for about 7.3 Lakh consumers.

IB.1.3. WBSEDCL intends to appoint an "Implementation Agency (IA)" that can design, deploy and maintain the Smart Metering system in TOTEX MODEL. The IA shall be responsible to finance and to implement the entire project. The IA shall be responsible for Supply, delivery, commissioning and operations of 3-ph smart energy meters for existing as well as future consumers having connected load of 50 kVA and above, related infrastructure as communication module, Head End System (HES) deployed in WBSEDCL Central Data Centre (CDC), Links, Integration between the HES and the proposed Meter Data Management System (MDMS) also physically deployed at CDC, its successful Operational Go-Live, deployment of both consumer portal and app as well as WBSEDCL user portal and maintain the system throughout the contract period. Utility shall pay the Monthly Reading Charge to IA as per actual operational meter-month on monthly basis in accordance with the terms and conditions of the Contract. IA shall transfer the entire system with all operations including all the hardware, software along with its valid licenses to WBSEDCL at the end of the Contract Period to facilitate seamless operation of Utility businesses.

The scope of work of the IA shall cover end-to-end metering in the selected AMI Project area to enable complete energy accounting with zero manual intervention. The Project scope shall include:

IB.1.3.1. Deployment of Smart Meters with NIC card along with SIMs.

IB.1.3.2. WAN communication systems.

IB.1.3.3. Deployment of HES and MDMS including servers and allied hardware at WBSEDCL Data centre.

IB.1.3.4. Integration with the proposed MDMS of WBSEDCL.

IB.1.3.5. Android based mobile app and accessories for capturing various information during meter installation & commissioning.

IB.1.3.6. Android based mobile app and accessories for capturing various information for collection of manual meter reading.

IB.1.3.7. Mobile app and portal for consumers.

IB.1.3.8. Portal for WBSEDCL users with access rights and roles with reporting.

The AMI Project shall be transferred to the Utility at no cost and as per the **Exit Management Plan** at the end of the term of the Contract on as-is where-is basis. The roles and responsibilities of the IA and payment thereof shall be governed by the terms and conditions laid down in the Contract.

IB.2. Eligibility of Bidder:

IB.2.1. Definition of Bidder: The bidder can be an individual organization or Joint Venture (JV) a consortium of maximum three (3) organizations meeting the qualifying Criteria (QR).

IB.2.2. Lead Bidder: One of the consortium/ JV members responsible for performing key components of the contract shall be designated Lead Bidder/ SI/ Implementation agency. Evidence of this authorization shall be provided by submitting a power of attorney signed by legally authorized signatories of all consortium members along with the bid.

IB.2.3. The Bidder (Lead Bidder in case of a consortium/ JV) shall have the authority to conduct all businesses for and on behalf of any and all the parties during the bidding process and, in the event the Lead Bidder will be awarded the Contract, during contract execution.

IB.2.4. Every Consortium/ JV Member shall provide consent to the Lead Consortium Member and make itself aware of all the proceedings of the bidding process and Project implementation through legally enforceable consortium agreement, power of attorneys, legal undertakings, etc. entered amongst all members of that Bidding Consortium including but not limited to those as prescribed in **ANNEXURE-III**, **ANNEXURE-IV** and **ANNEXURE-V**. In the absence of duly executed formats, the Bid shall not be considered for evaluation and will be rejected.

IB.2.5. The Lead Consortium/ JV Member shall designate and authorize one person to represent the Bidding Consortium in its dealings with WBSEDCL through a Power of Attorney as per **ANNEXURE-V** to perform all tasks including, but not limited to, providing information, responding to inquiries, signing of Bid on behalf of the Consortiums/ JV, etc.

IB.2.6. The Bidder (Lead Bidder in case of a consortium/ JV) shall be wholly responsible for execution of the contract.

IB.2.7. In case the Bidder being Indian Company acting as a lead partner is having collaboration with the Company incorporated outside India (Foreign Company), the Bidder shall in respect of such collaboration submit duly certified/ authenticated copies of the following documents:

IB.2.7.1. Certificate of Incorporation/ Registration Certificate issued by the competent authority under the law in force in the country of its incorporation.

IB.2.7.2. Memorandum and Articles of Association or document constituting the company and regulating its affairs.

IB.2.7.3. List of board of directors or regulating/controlling body.

IB.2.7.4. Address of its place of business in India, if any.

IB.2.7.5. Complete copy of agreement entered into by the Indian company with the foreign company together with gist of major terms, validity period, demarcation of scope

of work, role and responsibilities of each party to the agreement, technical, financial and management aspects of the agreement.

IB.2.7.6. Letter of undertaking of Commitment of the foreign company to continue partnering with agreement and to discharge its role / functions under the agreement till the completion of AMI project including the total contract period, if assigned by Utility.

IB.2.7.7. Any other papers or documents required by utility at a later stage or in future.

IB.2.8. In case of non-performance (slippage in milestones, scope & quality of work, discipline, etc. as assessed by WBSEDCL) and/or bankruptcy of any of the partners, the lead bidder shall take necessary remedial action through addition/change of partner for the concerned role. The addition/change of partner for concerned role shall be with necessary prior approval of WBSEDCL and shall be at no additional cost to the project cost already quoted at the time of bidding for the project. The addition/change of partner for concerned role shall be required to meet the Qualifying Criteria as per **IB.3**.

IB.2.9. Bidder or the Lead Bidder in case of a Consortium shall not have a conflict of interest with one or more parties in this bidding process. Participation by Bidder(s) with a conflict of interest situation will result in the disqualification of all Bids in which it is involved. Purchaser considers a conflict of interest to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations, and that such conflict of interest may contribute to or constitute a prohibited corrupt practice. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to:

IB.2.9.1. receive or have received any direct or indirect subsidy from any of them or

IB.2.9.2. have the same legal representative for purposes of this Bid; or

IB.2.9.3. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Purchaser regarding this bidding process; or

IB.2.9.4. participation by a Bidder or Lead Member in more than one Bid will result in the disqualification of all Bids in which it is involved. However, this does not limit the inclusion of the same product (commercially available hardware, software or network product manufactured or produced by the firm), as well as purely incidental services such as installation, configuration, routine training and ongoing maintenance/support, in more than one bid; or

IB.2.10. Sole bidder or any partner including lead bidder (In case of consortium/ JV) is not allowed to bid as partner of other bidder for the same bid.

IB.2.11. The lead bidder's direct experience in India or overseas will be considered.

IB.3. Qualifying Requirements (QR) of Bidder and Partners in case of consortium/JV:

IB.3.1. The Bidder must possess credentials prescribed as Qualification Criteria. If any bidder fails to fulfil the **Qualification Requirements (QR)**, his bid will be treated as non-responsive and no further correspondence/clarification will be taken into consideration for the same. It is also intimated that merely meeting the following requirements does not indicate that

the bidders shall be short-listed for opening of financial bid. The short-listing shall be made considering all the technical parameters and submission of sample and demonstration of smart metering solution.

IB.3.2. The bidder can be an individual organization or a consortium of maximum three (3) organizations meeting the QR.

IB.3.3. The Lead bidder/ Individual Bidder can be any of the three organizations as detailed in table below. In reference to the table below, the Lead/ individual bidder should meet its respective QR along with the QR of others (as given below) either as individual, Consortium or sub-contractor. Further, they have to provide clarity on the roles and responsibilities of each consortium member or sub- contractor.

Sl. No.	Lead Bidder	Consortium Member/Sub-contractor meeting respective QR		
		DL	MM	SI
1	Distribution Licensee (DL)	✓	✓	Optional
2	Meter Manufacturer (MM)	Optional	✓	Optional
3	System Integrator (SI)	Optional	✓	✓

IB.3.4. Qualifying requirements (QR) of the bidder:

QR of the bidder			
Sl. No.	**Description**	**Criteria**	**Documents required**
(A) General Pre-qualification Criteria **of Bidder**			
1	Bidders Identity	The bidder shall be a private/public Company registered under Companies Act 1956 / 2013 proprietary firm / partnership firm. [The bidder / Each Member of Consortium/ Sub- Contractor need to satisfy this condition]	Certificate of Incorporation and Registration.
2	Quality Certification	The Bidder should be an ISO 9001:2008 certified. OR Bidder should have CMMi Level 3 (minimum) certification. [In case of consortium, both the lead bidder and consortium partners need to satisfy this condition]	A valid ISO/ CMMi certificate on or before the date of publication of the tender.
3	Experience	The Bidder must have a) successfully executed & implemented AMR/AMI projects (meeting any of the criteria stated below) in an	List of clients and individual Client's PO /WO /LOI /LOA /Contract/ Certification on client letterhead and Performance certificate

		Indian/ Global Power Distribution Utility/ Distribution Franchisee in the last 7 years (i.e. FY 2017-18 to till the previous date of publication of this tender). b) successfully executed AMR/ AMI project covering implementation of minimum 20,000 nos. of Meters with required hardware, software and other associated accessories (Consisting of Smart Meters, DCU/Gateway/Router/ GPRS Access Point and HES) in a single/ multiple contract and project/ projects should have been operational for at least 01 year in last 07 years. [In case of Power Distribution Licensee to meet the QR, the licensee can use the credentials of its own or through its majorly owned subsidiary]	and contact details of clients as proof provided for the last 7 years needs to be submitted.
4	Financial Strength	a) The bidder should have average annual turnover of Rs. 100 Crores during last three financial years ending on 31- Mar-2023 (i.e. for the F.Y. 2020-21, 2021-22 & 2022-23). [In case of consortium bids, Minimum 50% to be met by Lead Bidder and balance to be met by other consortium members] b) The bidder should have a minimum working capital or its sanctioned limit of Rs.20 Crores during financial year ending on 31-Mar-2023. [In case of consortium bids, Minimum 50% to be met by Lead Bidder and balance to be met by other consortium members]	a) Income Tax return, All enclosures forming the part of Income Tax return (as applicable) and Audited Balance Sheet and certificate from Chartered Accountant stating turnover from each relevant line of business. b) Audit report for company registered under Company's Act & Tax Audit report for others to be submitted as a proof of net worth. In case of sanctioned limit, Bank sanctioned letter of the limit / Company secretary signed certification is required.

		c) Net Worth for the each of the last three Financial Years should be positive. Consider financial year ending on 31- Mar-2023 (i.e. for the F.Y. 2020-21, 2021-22 & 2022-23).	c) **FORM- II (B)** with attachments. (duly audited and approved by Authorized Audit Firm / CA)
5	Workforce Capability	The Bidder should have at least 15 personnel on its rolls with a minimum AMR/AMI implementation experience. The details of experience, roles & responsibilities of the personnel should be as per **SW.25**.	Signed resume of employees need to be submitted as per enclosed format in **ANNEXURE-XI**.
6	OEM Implementation Partner Status	The bidder should be an authorized implementation partner of OEM products proposed in the bid and should possess all the necessary authorizations of the OEM in order to supply, customize, implement and support their OEM solutions.	Authorization letter from OEM for next **10 years** back-to-back support of as per the format attached for Manufacturer's authorization form (MAF)
7	Authentication	Bidder must submit a certificate on company letterhead, stating that the bidder hasn't been blacklisted by any institution/ organization/ society/ company of the Central / State Government ministry/department, or its public sector organizations during the last five years, with company stamp and signed by authorized signatory. [In case of consortium all need to satisfy this condition]	Self-Certificate on company letterhead with company stamp and signed by authorized signatory as per **ANNEXURE- XIII** and **ANNEXURE-XIV**.
8	Office Location	Bidder shall have a registered office and operations in India for at least one year prior to submission of the bid. [In case of consortium, each member of consortium also shall have registered office in India]	Certificate of Incorporation/Registration Documents should be submitted as proof of the same.
(B) Qualification Requirement **for SI** (To be satisfied by the System Integrator only)			
1	Quality Assurance	1. The SI should be an ISO 41001:2018 certified. 2. SI should have CMMi Level 3 certification.	Valid ISO and CMMI certificate on or before the **Bid Submission date of the tender**.

		3. SI should have ISO 27001:2013 or latest certifications.	
2	Large Projects Implementation Experience	The SI should have implemented the Billing system for power distribution Utility in Global / India for Minimum 10 Lacs Consumers in last 10 years and system till the date of publication of this tender.	Purchase orders/ Work award/ work order from End Customer/ Certificate from the client on successful implementation and operation of the project. (Power Utility) with detailed scope of work.
3	Integration capability between HES/MDAS with utility systems	System Integrator must have successfully executed AMI projects **(Implemented HES/ MDAS system and Integrated with MDMS/ Utility Billing System)** with cumulative installation base of Minimum 1.5 lakh **Smart Meters** in the last 5 years till the date of publication of this tender.	Purchase orders/ Work award/ work order from End Customer/ Certificate from the client on successful implementation and operation of the project (Power Utility) with detailed scope of work.
(C) Qualification Requirement for **DL** (To be satisfied by the Power Distribution Licensee only)			
1	Authentication	Distribution licensee in India for last 5 consecutive years immediately preceding the Bid due date.	Self-attested copy of the license document as per the act.
2	Quality Certification	Bidder should have ISO 9001:2015 certificate	Copy of valid certificate
3	Work Experience	Distribution Licensee (on its own or through its majorly owned subsidiary) must have successfully executed & implemented AMI Projects for minimum 20,000 metering points for its own consumers and such projects should be in operation for at least one year as on Bid Date.	Evidence of such deployment along with PO/ WO/ LoA / Contract / Appropriate Certification from the ordering authority.
(D) Qualification Requirement for **MM/ Proposed MM** (To be satisfied by the Meter Manufacturer only)			
1	Technical Experience	The MM should be in the business of manufacturing Static and Smart Energy Meters and should have state of the art facility in India. Should be in Metering Business for at least 10 years as on date of Bid Submission.	Factory License Certificate/ MoA mentioning nature of Business.

			Purchase orders / Framework agreements for this duration or other documents that prove to this aspect.
2	Smart meter Experience	The MM must have successfully Supplied / Implemented 1,00,000 Smart Meters in AMI projects in Indian/ Global Power Distribution Utility in the last 10 years as Main Bidder, Consortium member/Sub-contractor (as on date of Bid Submission date).	Individual Client's PO/ WO/ LOA/Contract/ Certification on client letterhead.
3	Capacity	MM/ Proposed MM should have experience of manufacturing and supply of Static electricity meters/ Smart electricity meters. Minimum 10 Thousand Three phase CT operated Meters or 5,000 Three Phase CT operated Smart Meter per annum.	Proof of Work order & performance certificate/ work order completion certificate to be submitted.
4	ISI certification	Smart Meters offered should meet the relevant standards applicable in India IS: 16444 with latest amendment' and should have BIS Certification for each type of meters as mentioned in the NIT.	Copy of Certificate for each type of offered Smart Meter as mentioned in the NIT should be furnished.
5	Quality	MM should have valid ISO 9001 & 14001 for the manufacturing facility as on the bid submission date.	ISO certificate
6	Testing facility	The bidder should have in-house NABL accredited Laboratory Inside his factory premises.	A valid registration certificate mentioning issue / renewal / expiry date.
(E) Qualification Requirement for Proposed **Head End System (HES)**			
1	Experience	The proposed HES must have following deployment capabilities in Indian/ Global Utilities: • Successfully Commissioned cumulative 5 Lacs end points in AMI project. • Single Large AMI deployment experience of at least 30,000 Smart meters, with RF or Cellular communication.	Purchase order/Completion/ Go-live certification from client. Client certification with name, contact number and email with all required information (WBSEDCL may contact the client for verification purpose only).

		• In case the bidder offers meters for this project from different meter manufacturers, the offered HES system should be inter-operable amongst at least 3 different meter brands operating on single network and Head End System. However, if the bidder offers meters for this project from a single meter manufacturer, the said HES shall operate on single network and Head End System for those meters from that meter manufacturer. • Successful integration of HES with COTS MDMS product. All projects should be in operations as on bid submission date.	
(F) Qualification Requirement for Proposed **Meter data Management System (MDMS)**			
1	Experience	• The proposed MDM solution should have been successfully integrated with preferably at least 2 (two) nos. of different HES solutions in Indian/ Global Utility(ies) (power/ water/ natural gas/ telecom) in last 7 (seven) years. • The proposed MDM solution should have been successfully integrated with at least 2 (two) nos. of different Billing Systems in Indian/ Global Utility(ies) (power/ water/ natural gas/ telecom) or with Billing/ Other IT systems of 2 (two) different Indian/ Global Utility(ies) in last 7 (seven) years. • Product Capability (OEM) of MDMS: Proposed MDM solution should have been implemented globally for a minimum of aggregated 5 Lakhs number of consumers/ metering points in AMI/ AMR setup with each deployment handling interval meter reads (15/30 mins or any Demand Integration Period (DIP)	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date. *(In case Non-Disclosure agreement (NDA) is signed with the client, Bidder shall provide an undertaking for the NDA and shall also provide a client certification as proof of experience along with Client Name/ Email Address/ Contact no./ designation etc.)* b) Documentary evidence of completion of the Project or completion of Go-live status (i.e., Go-live certificate, UAT testing certificate etc.) of the respective project as per the definition of Go-

		specified by WBERC regulations and its amendments from time to time)	Live/ UAT specified therein or other documentary evidence indicating completion (e.g., proof of payment received/ proof of asset capitalized in books of accounts (as applicable) and client certificate for supply of material or similar proofs) along with contact details of the client. c) Certificate / report issued by Client / HES OEM/ solution provider. In case the MDMS solution provider, has integrated with their own HES, then a self-certification shall be provided. d) Any other documentation for implementation performance/ operation.
2	Certification	Should have CMMi (Capability Maturity Model Integration) Level 3 or IEC/ISO 27001 Certification (Software Development & Customization), as the requirement may be	Copy of valid certificate

IB.3.5. Certificate of Incorporation/Registration Documents should be submitted as proof of the same

IB.3.6. Intending Bidders desirous of participating in the tender are to log on to the website http://wbstenders.gov.in. The tender can be searched by typing '**wbsedcl**' in the search box of the website.

IB.3.7. Bidders willing to take part in the process of e-tendering are required to obtain Digital Signature Certificate (DSC) in the name of person who will sign the tender, from any authorized Certifying Authority (CA) under CCA, Govt of India (viz. nCode Solution, Safescrypt, e-Mudhra). DSC is given as a USB e-Token. After obtaining the Class 2 or Class 3 Digital Signature Certificate (DSC) from the approved Certifying Authority they are

required to register the fact of possessing the Digital Signature Certificates through the registration system available in the website.

IB.3.8. Intending bidders are to download the tender documents from the website stated above, directly with the help of the e-Token provided. This is the only mode of collection of tender documents. Details of submission procedure are given in "Instructions to Bidders".

IB.4. Responsibility of the Bidders:

IB.4.1. It shall be the sole responsibility of Bidders to determine and to satisfy themselves by such means as they consider necessary or desirable for all matters pertaining to this contract including, in particular, all factors that may affect the cost, duration and execution of the work.

IB.4.2. It must be understood and agreed that such factors have properly been investigated and considered while submitting the bid. Any claim, whatsoever, including those for financial adjustments to the contract, once awarded under these documents will not be entertained by WBSEDCL. Neither any change in time schedule of the contract nor any financial adjustments, arising thereof, shall be permitted by WBSEDCL, which are based on the lack of such clear information of its effect.

IB.4.3. The bid shall include all the information as per bid document.

IB.4.4. The Bidder may seek qualification on the basis of technical and financial capability of its Parent(s) and/ or its Affiliate(s) for the purpose of meeting the qualification requirements. Authorization for use of such technical or financial capability shall have to be provided from its Parent(s)and/or Affiliate(s). The technical and financial capability of a particular entity, including its Parent(s) and/or Affiliate(s), shall not be used by more than one Bidder.
The determination of the relationship of Parent(s) and/or Affiliate(s) with the Bidder shall be on the date 7 (seven) days prior to the last date of submission of the Bid. Documentary evidence to establish such relationship shall be furnished by the Bidder along with the Bid.

IB.4.4. The bidder shall bear all the costs associated with the preparation and submission of bid and WBSEDCL in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

IB.4.5. In order to avoid any problem arising out of network error or server error, bidders are advised to submit the bid, well in advance of the last date and time of submission of the bid.

IB.5. Formation of cartel & penal Measures: Any evidence of unfair trade practices, including overcharging, price fixing, cartelization etc. as defined in various statutes, will automatically disqualify the parties. Repeated occurrence of such evidence of above tenderers may also be viewed seriously by the WBSEDCL authority and penal measures as deemed fit would be imposed on such tenderers.

IB.6. Key Dates: Schedule of Dates for e-Tendering:

Sl. No.	Activity	Date & Time
1	**Publishing Date**	26.07.2024 at 1200 hrs.
2	**Document Download start date**	26.07.2024 at 1200 hrs.

3	**Seek clarification start date**	26.07.2024 at 1200 hrs.
3	**Seek clarification end date**	01.08.2024 at 1600 hrs.
4	**Date of Pre-bid Discussion**	06.08.2024 at 1400 hrs.
5	**Bid submission start date**	09.08.2024 at 1400 hrs.
6	**Bid submission end date**	20.08.2024 at 1400 hrs.
7	**Last date of physical submission of EMD**	20.08.2024 at 1400 hrs.
8	**Technical Bid opening date**	22.08.2024 at 1400 hrs.
9	**Financial Bid opening date**	To be intimated later

If any 'Strike' or 'Holiday', falls on any of the scheduled date, then the next working day (between mentioned working hours) shall be considered as scheduled date and schedule time.

IB.7. Pre-Bid Discussion:

IB.7.1. Pre-bid discussion will be held at WBSEDCL as per schedule indicated in **"Key Dates Clause"** above to clarify the queries, if any, from the vendors in respect of tender. Selected vendors who shall purchase the Bid may participate (maximum two persons) in the said meeting for any such clarification.

IB.7.2. Relevant queries in soft copy EXCEL format as per **ANNEXURE-XII** must be sent within the scheduled dates to the following mail id: ceit@wbsedcl.in with a copy to pankajk.sahoo@wbsedcl.in and mrinmoy.roy@wbsedcl.in

IB.7.3. Non-attendance at the pre-bid discussion will not be a cause for disqualification of the bidders.

IB.8. Clarification on Bidding Documents: If there be any discrepancy or obscurity in the meaning of any clause of the bid document, such queries must be sent to the Chief Engineer, IT&C Cell, in written form three days prior to the date of Pre-bid discussion. Such query received from vendors prior to pre-bid discussion shall only be discussed in the pre-bid discussion. No other query except the written submitted ones will be clarified during pre-bid discussion. If any changes are decided in pre-bid meeting, the same will be uploaded in the website http://wbtenders.gov.in and no other communication shall be made afterwards on the issues discussed in the pre-bid meeting. The clarification given in pre-bid discussion shall be final and binding on the bidder.

IB.9. Amendment / Addenda of Bidding Documents: At any time, prior to the deadline of submission of Bid, WBSEDCL may, for any reason, modify the Bidding Documents by issuing Addenda / Amendments and the same will be uploaded in the website (http://wbtenders.gov.in) only, in due time. WBSEDCL shall not have any obligation to inform the vendor through any other mode of communication.

IB.10. Language of the Bid: The bid so prepared by the bidder and all other correspondences and documents relating to the bid, exchanged by and between the bidder and WBSEDCL, shall be written in English Language only.

IB.11. Currencies of Bid and Payment: All prices shall be quoted by the bidder in 'Indian Rupees' (INR) only. Payment is also to be made in 'Indian Rupees' (INR) only.

IB.12. Period of validity of Bid: The bid shall remain valid for acceptance up to 180 (One hundred and eighty days) from the date of opening of tender. WBSEDCL may request to extend Validity of the bid beyond 180 (One hundred and Eighty) days if required so, without any change in offer.

IB.13. Earnest money [Bid Guarantee]:

IB.13.1. The bidder desirous of taking part in a tender invited by Offices of WBSEDCL shall login to the e-Procurement portal of Government of West Bengal https://wbtenders.gov.in using his login ID and password. All bids must be accompanied with a refundable earnest money, as "Bid Guarantee". The bid shall be considered as non- responsive if the earnest money is not submitted along with the bid.

IB.13.2. The bidder shall select the tender to bid and initiate payment of **EMD of Rs. 2.04 Cr.** (Rupees Two Crores) [2.5% of **estimated price of Rs. 81.48 Cr.**] issued by any branch of any Indian Scheduled Bank in favour of West Bengal State Electricity Distribution Company Limited payable at Kolkata, is to be uploaded while submitting the bid online. The details of the instrument are to be entered while the bid is submitted online. Following payment options are available for paying EMD amount through online mode or BG mode:

IB.13.2.1. Net-banking through Payment Gateway.

IB.13.2.2. RTGS/ NEFT Payment: On selection of RTGS/NEFT as the payment mode, the e-Procurement portal will show a pre-filled challan having the details to process RTGS/ NEFT transaction. The bidder will print the challan and use the pre- filled information to make RTGS/NEFT payment using his bank account. Once the payment is made, the bidder will come back to the e-Procurement portal to continue the bidding process after expiry of a reasonable time to enable the RTGS/NEFT process to be completed.

IB.13.2.3. Submission of EMD through BG: For submission of EMD in the form of BG, bidders will have to opt for EMD Exemption in e-tender portal and upload scanned copy of BG in the EMD exemption document upload section. Physical copy of BG shall be submitted at the office of tender inviting authority as per respective clauses of NIT.

IB.13.3. EMD amount can be paid either in online mode or submitted through Bank Guarantee (BG) in full. Partial payment through online mode and remaining submission through BG is not allowed. In case the EMD is submitted in the form of irrevocable Bank Guarantee, it is to be submitted as per format in **ANNEXURE-VIII** and shall remain valid initially for a period of six months from the last date of submission of the bid document and claim period will be further 3 months. The Bank details for preparation of such BG is:

Beneficiary Name: West Bengal State Electricity Distribution Private Limited
Name of Bank: Punjab National Bank
Name of Branch: PNB Mayukh Bhavan Branch
A/C no.: 1096202100000241
IFSC: PUNB0109620

IB.13.4. General Instructions for Online Payment:

IB.13.4.1. The bidder will have to mandatorily pay through Net-banking facility once Net banking mode is opted for payment.

IB.13.4.2. Status of NEFT/ RTGS payment through Challan for a bid may take time for bank settlement which is updated in 24 Hrs. (approx.). As such bidders opting to pay

through NEFT/ RTGS mode shall make payment well before 24 Hrs. to avoid any complicacy.

IB.13.4.3. In case actual EMD amount as per NIT is more than the one shown in E-tender Portal, bidders will have to opt for NEFT/ RTGS mode (challan mode). In that case the total actual EMD amount is to be paid only through NEFT/ RTGS mode (challan mode).

IB.13.4.4. The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/C from which the payment of EMD has been initiated.

IB.13.5. <u>Refund/Settlement of EMD Amount</u>:

IB.13.5.1. For unsuccessful bidders, EMD amount submitted against the tender shall be refunded automatically, through an automated process, by NIC portal on receipt of updated status of any bid.

IB.13.5.2. The 'Bid Guarantee' of the successful vendor/Bidders, will be returned within 30 (thirty) days from the date of acceptance of Performance Guarantee to be submitted as per Performance Guarantee Clause of bid document.

IB.13.5.3. The Bid Guarantee of the unsuccessful vendors/Bidders will be returned against their written claim within one month from the date of placement of order on the vendor/successful Bidders.

IB.13.5.4. The bank account used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/C from which the payment of EMD has been initiated.

IB.13.5.5. In case the EMD is submitted in the form of Bank Guarantee, it is to be submitted as per format in **ANNEXURE-VIII** and shall remain valid initially for a period of 180 days from the date of opening of the bid document and claim period will be further 3 months.

IB.13.5.6. For any queries related to payments and refunds, bidders will have to communicate with ICICI Customer Support, viz, 033-40267512/13 since payment gateway facility used by E-tender portal is maintained by ICICI.

IB.13.6. Successful Bidder(s) shall have to mandatorily create vendor ID through WBSEDCL Web Portal Vendor Corner, if not created earlier.

IB.13.7. No interest shall be payable by WBSEDCL on the above Bid Guarantee.

IB.13.8. The Bid Guarantee shall be forfeited for any of the following reasons:

IB.13.8.1. If during the period of bid validity, the bidder withdraws or modifies the bid in part or as-a-whole.

IB.13.8.2. If the successful Bidder/Bidders fails/fail to accept the order unconditionally **as per "Acceptance of Order" clause** of bid document or fails/fail to furnish the contract performance guarantee as stipulated in **PBG clause** of bid document.

IB.13.8.3. If the successful bidder/bidders fail to extend the validity period of EMD as per **"Earnest Money" Clause** of bid document.

IB.13.8.4. If the undertaking provided regarding blacklisting is found to be false.

IB.13.8.5. If any cartel is formed by the tenderer in their quotation.

IB.14. General guidance for e-Tendering: Instructions/Guidelines for electronic submission of the tenders for assisting the bidders to participate in e-Tendering are mentioned below:

IB.14.1. Registration of Bidders: Any bidder willing to take part in the process of e-Tendering will have to be enrolled & registered with the e-Procurement system, through logging on to https://wbtenders.gov.in.

IB.14.2. Digital Signature certificate (DSC): Each bidder is required to obtain a class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders.

IB.14.3. The bidder can search and download NIT & Tender Documents electronically from the https://wbtenders.gov.in website using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.

IB.15. Signing of Bids:

IB.15.1. The bid shall be downloaded from the website www.wbtenders.gov.in and shall be signed by a **person / person(s) duly authorized by the bidder.**

IB.15.2. To be qualified for evaluation and finalization of contract, Bidder/ Bidders shall submit a written power of attorney, authorizing the signatory of the Bid to act on behalf of the Bidder in the form and manner which is acceptable by WBSEDCL.

IB.15.3. All the pages of the bid and where, entries/amendments have been made, shall be signed by the person/persons signing the bid.

IB.15.4. The complete bid shall be without alterations, interlineations or erasers, except those to accord with instructions issued by WBSEDCL or as necessary to correct errors made by the bidders, in which case such corrections shall be initialled by the person/persons signing the bid. Bids not duly signed shall be treated as cancelled.

IB.16. Submission of Bid: Bids shall be submitted as under:

IB.16.1. General process of submission: Tenders are to be submitted online through the website (www.wbtenders.gov.in). All the documents uploaded by the Tender Inviting

Authority form an integral part of the contract. Tenderers are required to upload all the tender documents along with the other documents, as asked for, in the tender, through the above website within the stipulated date and time as given in the Tender.

Tenders are to be submitted in two folders - one is Technical Proposal and the other is Financial Proposal. Documents for Technical Proposal are to be submitted at pre-defined folders. Price bid under financial proposal is to be submitted at pre-defined folder named: BoQ.

The tenderer shall carefully go through the documents and prepare the required documents and upload the scanned documents in Portable Document Format (PDF) to the portal in the designated locations of Technical Bid.

The bidder needs to download the Forms / Annexure/ BOQ, fill up the particulars in the designated Cell and upload the same in the designated location of Technical folder / Financial folder. The documents uploaded shall be virus scanned and digitally signed using the Digital Signature Certificate (DSC). Tenderers should take note of all the addendum/corrigendum related to the tender and upload the latest documents as part of the tender. Original copies of the uploaded documents may be submitted for physical verification if required by the Tender Inviting Authority at the time of technical evaluation.

IB.16.2. Part 1: Technical Proposal: The Technical Proposal shall contain scanned copies and/or declarations in the following standardized formats in two covers (folders).

IB.16.2.1. Statutory Cover:

A. <u>Contents of "Drafts" folder:</u>

a. **EMD:** Copy of Bank Guarantee (BG) (in case online EMD is chosen to be exempted by the bidder(s)).
b. Valid Power of Attorney by Bidder.

B. <u>Contents of "NIT" folder:</u>

a. **Tender Document with all Annexures:** Signed Copy.
b. **Addenda/Corrigendum:** Signed copy if published.

C. <u>Contents of "Annexure" folder:</u>

a. Application for Tender: Bid Proposal (vide **ANNEXURE -VII**).
b. Price Schedule in Un-priced condition**:** BoQ (vide **ANNEXURE-II**).
c. **All Annexures,** from **ANNEXURE-I to XXVI**, are to be submitted in details at Annexure folder in their respective format.
d. SLA and key performance parameters
e. If Bidder being Indian Company is having collaboration with the Company incorporated outside India (Foreign Company), the Bidder shall in respect of such collaboration submit duly certified/authenticated copies of the documents mentioned in IB clauses.

D. <u>Contents of "Forms" folder:</u>

a. **<u>Mandatory Condition</u>: FORM-I**

b. **Sheet Containing Document Details:** **FORM-II**

Only downloaded copies of the relevant documents are to be uploaded, and digitally signed by the bidder.

IB.16.2.2. Non-Statutory Cover (My Document):

A. Company Details: Copy of the following document:

a. Company Profile description
b. Registration Certificate of the company
c. PAN Card
d. GST registration certificate
e. Valid PF (if applicable) Registration Certificate
f. Valid Professional Tax certificate (if applicable)

B. Credentials:

a. Documents to be submitted as mentioned in Eligibility Criteria;
b. Any documents found necessary.

IB.16.2. Part 2: Submission of Sample:

IB.16.2.3. After the bid evaluation is completed and the L1 bidder is declared, WBSEDCL shall intimate the L1 bidder by a Letter of Intent (LoI).

Then, within 4 (four) days of receipt of the intimation, the L1 bidder shall submit the sample smart meters along with manufacturer's test result and GTP, on any working day, from 11:00 A.M. to 04:00 P.M. on week days by to the Office of the Chief Engineer (DTD), Abhikshan, Sec-V, Salt Lake, Kolkata- 700091.

The bidder will be given a receipt, jointly signed by the bidder and DTD officials, mentioning the samples and papers submitted by the bidder as per check list:

1. One no. of 3-ph consumer whole current smart meter with NIC card from each meter manufacturer (in case, the bidder opts to provide whole current smart meter for solar generation meter end-point connections. For details, please refer to **SW.1.4.**)
2. One no. of 3-ph consumer smart meter (LT-CT of accuracy class 0.5s) with NIC card from each meter manufacturer;
3. One no. of 3-ph consumer smart meter (11 kV of accuracy class 0.5s) with NIC card from each meter manufacturer;
4. One no. of 3-ph consumer smart meter (33 kV of accuracy class 0.5s) with NIC card from each meter manufacturer;
5. One no. of 3-ph consumer smart meters (132 kV of accuracy class 0.2s) with NIC card from each meter manufacturer;
6. Manufacturer's test result and GTP;
7. BIS certification;
8. Three copies of the drawings for each meter as mentioned in the above.

The bidder should present a practical demonstration of their proposed solution in a prototype HES (considering any one of HES solution). Required SIM card(s) should be arranged by bidder itself. The sample meters will then be tested compared to

manufacturer's test result and GTP, at DTD laboratory, WBSEDCL. The demonstration should showcase the following test cases:

a. Linking of Smart Meter and HES;
b. Interoperability of NIC card with at least 2 leading Telecom Service Providers of India.
c. Capture of Instantaneous Parameters of meter;
d. Capture of billing data from meter (for consumer meter);
e. Capture of Load survey data from meter;
f. Last Gasp/First Breath as Alert/Event.
g. Sample meter will be tested for accuracy and tamper compared to manufacturer's test result and GTP.

IB.16.2.4. The bidder should present a practical demonstration of their proposed solution in a prototype HES (considering any one of HES solution). Required SIM card(s), NICs or any other accessories should be arranged by bidder itself. The sample meters will then be tested compared to manufacturer's test result and GTP, at DTD laboratory, WBSEDCL. The demonstration should showcase the following test cases:

a. Linking of Smart Meter and HES;
b. Interoperability of NIC card with at least 2 leading service providers of India.
c. Capture of Instantaneous Parameters of meter;
d. Capture of billing data from meter;
e. Capture of Load survey data from meter;
f. Last Gasp/First Breath as Alert/Event.
g. Sample meter will be tested for accuracy and tamper compared to manufacturer's test result and GTP.

Time Required for Electrical testing including physical examination and demonstration are as follows:

Sl. No.	Event	Timeline	Responsibility	
			WBSEDCL	Advantageous Bidder
1.	Determination of L1 bidder	D0	Yes	-
2.	Intimation for submission of meter samples through Letter of Intent (LoI) for testing and solution demonstration	D0	Yes	-
3	Submission of meter samples and drawings	D0+4		Yes
4	Issuance of receipt for submission of meter samples	D0+4	Yes	
5	Completion of meter testing, physical verification and solution demonstration	D0+18	Yes	Yes
6	Notification to the Bidder on outcome of meter testing, physical examination and solution demonstration	D0+20	Yes	-

IB.16.2.5. After successful result of their demonstration and meter test results along with other qualifying requirements, a Letter of Award (LoA) shall be issued to the L1 bidder by WBSEDCL.

IB.16.2.6. Failure during Sample testing and demonstration:
If the L1 bidder fails to submit meters in the stipulated time or fails in their subsequent testing and demonstration of solution, **the LoI issued by WBSEDCL shall be cancelled and a new LoI shall be shared with the next Bidder** according to the financial evaluation rank starting from L2 for similar course of activities as mentioned above, provided the next ranked bidder accept the price quoted by the L1 bidder.

IB.16.2.7. Financial Proposal:

A. Bill of Quantities (BoQ): The bidder shall quote the rate in the space marked for quoting rate in the Price Bid Sheet of the downloaded BOQ file.

B. While entering the figures in BoQ for quotation, the bidder should opt for entering values for serial no. 1 of the BoQ Part-I and Part-II as per the condition as following (please refer **SW.1.4.**):
EITHER FOR 3-phase whole current import-export meter having current rating 20-100A OR FOR 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s.
Bidders can submit quotation for either one type of meter but not for both.
*Any deviation in the format, content (Other than entry of the quoted price at the desired blank spaces) of the Price bid/BOQ will render the tender liable to be summarily rejected.

IB.17. Submission of original copies of documents of Earnest Money Deposit:

IB.17.2. Mode of Payment: In case the online payment is chosen to be exempted by the bidder(s), the EMD must be submitted in the form of Bank Guarantee (BG) of any scheduled Bank of RBI. Payment in any other form will not be accepted.

IB.17.3. Place of submission: The original copies of such BG, towards Earnest Money Deposit shall be submitted in the following office:

Office of the Chief Engineer,
IT & C Cell,
West Bengal State Electricity Distribution Company Limited,
Vidyut Bhawan, 3rd Floor, D-Block,
Salt Lake, Sector-2,
Kolkata-700091.

IB.17.4. Time of submission: The original copies of such BG towards EMD shall be submitted in a sealed envelope in the office as stated above within the date and time as specified in the NIT. If the bidder fails to submit the original copies within the due date and time his tender will not be opened and his bid will stand rejected.

IB.18. Conditional and incomplete tenders are liable to summary rejection.

IB.19. No price preference will be allowed to any tenderer based on the size of the industry or its geographic location. Co-operative Society will not be considered with separate status.

IB.20. Late Submission of Bid: Bidder shall take all possible measures to submit the bid within the

schedule date & time at specified location prescribed elsewhere in the bidding document. Late submission of bid for whatever reason shall not be accepted.

IB.21. Opening and evaluation of tender:

IB.21.2. Opening of technical proposal:

IB.21.2.7. Technical proposals will be opened by the Tender Inviting Authority or his authorized representative electronically from the website stated above, using their Digital Signature Certificate.

IB.21.2.8. Technical proposals for those tender whose original copies of BG or online payment confirmation towards EMD have been received will only be opened. Proposals corresponding to which the confirmation towards EMD has not been received, will not be opened and will stand rejected.

IB.21.2.9. All bids found to be responsive will be examined in respect of "Mandatory Requirements" & other qualifying requirements as detailed in the bid document. Bids which do not satisfy the "Mandatory Requirements" and qualifying requirements will not be considered for technical evaluation.

IB.21.2.10. The bidder shall not take any commercial deviation from the stipulation of Bid document. If the bidder takes any commercial deviation, his Bid may be liable for rejection.

IB.21.2.11. Techno-commercial Deviations, if any, must be brought out in the specified Deviation Schedule **(ANNEXURE-X)**. Techno-commercial deviations indicated elsewhere will not be considered in any circumstances. WBSEDCL during Techno Commercial Evaluation will examine these deviations. Negative deviations will not be accepted in any circumstances and shall be considered as non-responsive and shall be liable for rejection. When there is no deviation, this sheet is to be submitted with the offer duly signed with an endorsement indicating "No Deviation". Deviations not indicated here will not be taken into consideration.

IB.21.2.12. The summary list of bidders, whose bids will be found techno-commercially eligible, will be uploaded in the web portals. Date of opening of financial bid will be intimated to the techno-commercially qualified tenderers.

IB.21.3. Opening of financial proposal (price bids):

IB.21.3.7. Financial proposals submitted by the tenderers in the prescribed format (2-part **BoQ Format**) and declared techno-commercially eligible, will be opened electronically by the Tender Inviting Authority from the web portal stated above on the prescribed date. The first part of the BoQ shall be considered for bidding and the second part are to be filled by bidders with the detailed price breakup.

IB.21.3.8. No deviation in any form in the price-bid sheet is acceptable.

IB.21.3.9. The encrypted copies will be decrypted and evaluated.

IB.21.3.10. After opening of the financial proposal, the preliminary summary result containing

inter-alia, name of bidders and the rates quoted by them will be uploaded.

IB.21.3.11. The Tender Accepting Authority may ask any of the tenderers to submit analysis to justify the rate quoted by that tenderer.

IB.21.3.12. For any discrepancy in the number of figures and words, the quoted amount in figure will prevail.

IB.21.4. Evaluation and Comparison of Bids (Price bids):

IB.21.4.7. On examination of documents submitted under different covers WBSEDCL will evaluate and compare the bids determined to be substantially responsive at each step.

IB.21.4.8. Evaluation of bid shall be made on the total price of all the line items clubbed together. This however will not encroach the right of WBSEDCL to go into further processes for item wise evaluation, if required. Total price shall be calculated on the basis of quantity indicated in the NIT.

IB.21.4.8.1. Evaluation of Bid will include and will consider the following:
Total Quoted price.
and the lowest quoted price will be considered as L1.

IB.21.4.9. While evaluation, the Tender Inviting Authority or his authorized representative may summon of the bidders and seek clarification / information or additional documents or original hard copy of any of the documents already submitted and if these cannot be produced within the stipulated timeframe, their proposals will be liable for rejection.

IB.21.4.10. Conditional Rebate / Discount, if any, offered by any Bidder shall be outside the purview of commercial terms & conditions & shall not be considered during Bid evaluation.

IB.22. Time Schedule:

IB.22.1. Meter installation schedule:

The number of meters both existing and projected for the duration of the project that are needed to installed phase-wise for this project are illustrated in **TABLE T1** (The region-wise breakup of the existing consumers can be found in **Clause SW.2.1.**)

TABLE T1

Implementation phase	Period (in months)	Existing metering endpoints (in nos.)	Projected new metering endpoints (in nos.)	Total (in nos.)	% against total metering endpoints	Meter Installation per month (in nos.)
1st	First 6	932	250	1,182	5	-
2nd	Next 26	12,656	2,923	15,579	66	**599**
3rd	Final 88	0	6,889	6,889	29	**79**
Total	**120**	**13,588**	**10,062**	**23,650**	**Average Meter Life-cycle months: 84**	

The project schedule shall be guided by the concept of **Total Meter-months** (**TMM**). The methodology for determining the 'Total Meter-Months' as well as 'Operation and Maintenance Period of the AMI system' is provided below:

For deployment of 23,650 nos. Smart Meters in the Project area,

'Total Meter-Months' is determined as below:

Total Meter-Months = (Total number of smart Meters to be installed in the AMI Project X Avg. Meter Lifecycle months) = 23,650 meters X 84 months = 19,86,600 Meter-months (**A**)

Where, "**Meter-months**" is- at any point of time, is calculated as the sum of number of months from operationalization of the meter or Operational Go-Live, whichever is later, for all meters installed and commissioned by the IA, considering all the Change Orders issued by the Utility, and "**Average Meter Lifecycle Months**" is defined as average number of months of a meter that remains operational in the circuit during the contract period i.e. 84 (Eighty-four) months commencing from Operational Go-Live.

The implementation of the AMI system is aligned to the schedule provided above. This implies the following:

a) 1182 Smart Meters (5% of total) are to be operationalized at the end of 6th Month from date of execution of the Contract;

b) From there on, in the 2nd phase, for both existing and new connections, another 15,579 Smart Meters (~66% of total) are to be operationalized (i.e. 599 meters/month)

At the end of second phase, a total of 16,761 **(C)** smart meters are to be operationalized at the end of 32 Months from date of execution of the Contract;

d) In the final phase, the rest 6,889 smart meters (@ avg. 79 meters/month) comprising of the projected new connections (as and when effected) are to be operationalized during the rest of contract duration until the completion of installation of 23,650 smart meters and shall not exceed the TMM of the project or TMM is exhausted whichever is earlier.

The accrual of meter-months will commence as soon as the first lot of 5% of total Smart Meters are installed and operationalized at the end of 6th Month from date of execution of the Contract. Hence, 'Meter-Months' of AMI system operated after operational go-live is determined as below:
Month-wise count of Smart Meters are to be installed (Table T2):

TABLE T2

Month	Meter Installed during the period	Total Smart Meters Installed	Meter-Months	Cumulative-Meter-Months
1 to 6	1182	1182	0	0
7	599	1781	1182	1182
8		2380	1781	2963
9		2979	2380	5343
10		3578	2979	8322
11		4177	3578	11900

…		…	…	…
…		…	…	…
23		11365	10766	101558
24		11964	11365	112923
25		12563	11964	124887
26		13162	12563	137450
27		13761	13162	150612
28		14361	13761	164373
29		14961	14361	178734
30	600	15561	14961	193695
31		16161	**15561**	209256
32		16761	**16161**	225417
TOTAL		**16761**	**225417**	**225417**
33		16840	16761	242178
34		16919	16840	259018
35		16998	16919	275937
…	79	…	…	…
…		…	…	…
117		23476	23397	1932132
118		23555	23476	1955608
119		23634	23555	1979163
120	16	23650	23634	2002797

From TABLE T2, it may be noted that the Calculated meter months (A) is supposed to be exhausted in the 120th month i.e. the contract period will end by the 120th month.

Hence the Total '**Operation and Maintenance period of the AMI system**' = (Months of operating Smart meters prior to Installation Milestone + 'Months' of operating AMI system after Installation Milestone) = 120 months - 6 months= 114 months.

IB.22.2. Before commencement of the meter installation, the following activities shall be completed by the IA:

a. Contract Finalization,
b. Project Kick off,
c. Core team finalization,
d. Document standards and templates finalization, SLA sign off etc.,
e. Specification of System Architecture and Software Solution finalization,
f. Site Survey,
g. Resource Mobilization,
h. Test plan,
i. Training plan finalization,
j. QA/QC plan & FAT testing

IB.23. Price:

IB.23.2. Price offer shall be submitted in the prescribed format only.
IB.23.3. No deviation in any form in the Price Bid Sheet is acceptable.

IB.24. Tax and Duties and other Levies:

IB.24.2. The Bidder(s) shall be solely responsible for the taxes that may be levied on the Bidder(s') persons or on earnings of any of his employees and shall hold the employer indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under "Income Tax Act, 1961" for the Contractor or his personnel. If it is obligatory under the provisions under the "Income Tax Act,1961" deduction of Income Tax at source shall be made by the Employer.

IB.24.3. GST shall be admissible based on rule and rate in force and will be payable extra. Bidder should be registered under GST Act.

IB.25. Statutory Obligation: Statutory obligations as per law of the land are to be complied.

IB.26. Variation during execution: No. of meters as incorporated in this tender are provisional, which may vary up to -10% to +10% (throughout the contract, from the date of issuance of LOA) of the ordered quantity during course of execution of the contract as per actual requirement and decision by WBSEDCL. WBSEDCL shall communicate such variation of quantity to the vendor in writing. The unit price to be quoted by the bidder and incorporated in the order would remain valid for such variation of quantity.

IB.27. Issuance of LOA: Methodology of award of Contract:

IB.27.2. WBSEDCL will award the contract to the vendor whose bid has been determined to substantially responsive and has been determined the lowest evaluated bid, provided further that the bidder is determined to be qualified to perform the contract satisfactorily. WBSEDCL shall be sole judge in this regard.

IB.27.3. L1 will be awarded for providing the service. In the event of non-performance by the L1 bidder within reasonable time frame, the L2 and/or L3 bidder may be approached to perform the job.

IB.28. Acceptance of LOA: The vendor shall submit written unconditional acceptance of LOA within 15 (Fifteen) days from date of issuance of the same, also successful vendor has to submit a signed contract document (by authorized signatory of the vendor) as per **ANNEXURE-XVI**. Submission of conditional acceptance of LOA shall be treated as non-compliance of this clause.

IB.29. Right to reject Bids: WBSEDCL reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time 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 the reason for WBSEDCL's action.

IB.30. Mandatory Condition: The bidder shall provide documentary evidence to the satisfaction & acceptable to WBSEDCL to establish that they have the requisite credential, capability and experience to handle the contract and meet requirements of all the Mandatory Conditions indicated in **FORM-I**.

IB.31. Settlement of Disputes: In case of any dispute arising out the contract, the same should be settled through meeting between the WBSEDCL and the contracting vendor at the appropriate level. Any legal dispute for adjudication and/or Court Case shall be exclusively within the jurisdiction of Hon'ble High Court at Calcutta or any competent court at Kolkata only.

IB.32. Correspondence: The bidders, for communicating with WBSEDCL, for this job may use the following modes:

Email: ceit@wbsedcl.in , pankajk.sahoo@wbsedcl.in, mrinmoy.roy@wbsedcl.in
Telephone – (033) 2319 7278.

IB.33. Representative of Bidder(s): The vendor is required to nominate one officer exclusively for this project from commencement to completion as a Nodal Officer to be stationed at Kolkata, with whom WBSEDCL will contact on all matters related to this order. The vendor has to specifically furnish to WBSEDCL, the name, designation, Telephone no. including mobile no., email address of such person.

IB.34. General Responsibilities and Obligations: This section describes the general responsibilities and obligations of the Contractor and the Employer.

IB.34.1. Responsibilities for the Implementation Plan: The bidder's technical proposal shall include a project implementation plan and schedule spread over **6** months from date of award that is consistent with the implementation plan detailed in this specification. The Implementation plan shall include the activities of the Bidders, showing all key milestones and clearly identifying the nature of all information. **The Bidder shall submit a preliminary Project implementation plan along with the Bid** which shall include at least the following activities:

a) Understanding of WBSEDCL and its requirement with respect to Project implementation;
b) Overall system architecture and system philosophy capable of scale-up;
c) Details of proposed methodology;
d) Schematic Diagram of Proposed System Configuration;
e) An approach paper documenting the interfaces for integration with existing and future applications based on the information provided by utility;
f) Project team structure;
g) Line of Credit / Source of funding and supporting documents;
h) Governance Framework;
i) Resource planning and estimation;
j) Risk planning;
k) Quality Assurance Program;
l) Privacy by Design document;
m) Site Survey;
n) Documents, Data Requirement Sheet, Drawing submission and approval;
o) Installation & Field update schedule;
p) Repair and Maintenance Schedule including details on Spares Management;
q) Training schedule.

IB.35. Conflict of Interest:

IB.35.2. The Bidder shall not have a Conflict of Interest that may affect the Tendering Process. Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, the Bid Security of the bidder shall be forfeited for the time, cost and effort of the Authority including consideration of such Bidder's Proposal, without prejudice to any other right or remedy that may be available to the Authority hereunder or otherwise.

IB.35.3. Any Bidder will be found to have a conflict of Interest, if his near relative is posted as an employee/officer in any capacity in WBSEDCL, who is associated with the Tender Inviting Authority or vice-versa.

IB.35.4. Any Bidder will be found to have a Conflict of Interest, if any employee of the bidding firm/company has or develops a financial or other interest with any employee/officer of

WBSEDCL associated with the Tender Inviting Authority during execution of the contract or vice-versa.

IB.35.5. Any Bidder has a relationship with another Bidder/Bidders, directly or through common third parties, that puts them in a position to have access to each-others information about, or to influence the Tendering Process of either or each of the Bidder will be found to have conflict of interest.

SCOPE OF WORK (SW)

SW.1. Introduction and scope:

SW.1.1. WBSEDCL has implemented smart metering programme in different phases and projects which accounts for an approx. of 7,30,000 endpoints that includes consumers having connected load between 5 to 50 KVA of Industrial & Commercial category and all Govt. consumers below 50 KVA. It has already implemented a Centralize MDM solution hosted at cloud and integration with existing applications considering license of 7.3 lakh end points and future scalability up to 2.5 Cr. end points.

SW.1.2. WBSEDCL have already implemented Meter Data Acquisition System (MDAS) based on AMR under R-APDRP Part-A project funded by Government of India. Now, WBSEDCL intends to implement smart metering programme (AMI) for about 23,650 endpoints phase-wise that will comprise of consumers having connected load of 50 KVA and above. For 132 kV connections, two smart meter connections will be effected. Also, two and three smart meters shall be installed for solar net meter & net billing connections respectively.

SW.1.3. For that, WBSEDCL intends to Roll-out phase-wise 23,650 Smart meters with communication module for existing and future consumers having connected load of 50 kVA and above and deployment of Head End System (HES) and Meter data Management System (MDMS) including servers and allied hardware located in WBSEDCL Central Data Center (CDC) including integration with the proposed MDMS and execution of the Project in TOTEX model. The communication module for Smart meter should be a NIC card with one physical SIM (preferably dual physical SIMs) or one e-SIM on 4G (fall-back to 2G) network based Cellular Communication (This shall be applicable on all relevant clauses of the communication module throughout the NIT).

SW.1.4. Three-Phase CT operated meters will be installed under this projects and installation will be spread over the licensee area of WBSEDCL. For this project, 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s, 3 Phase 11 kV meter having internal CT ratio 50/5 and accuracy class of 0.5s, 3 Phase 33 kV meter having internal CT ratio 100/1 and accuracy class of 0.5s, 3 Phase 132 kV meter having internal CT ratio 200/1 and accuracy class of 0.2s and 3-Phase whole current import-export meter having current rating of 20-100A for solar generation meters shall be needed to be supplied and installed. However, as an alternative to 3-phase whole current smart meters with import-export mode, the bidder can also choose to supply 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s required to complete the metering circuit as per the technical specifications laid down in the **ANNEXURE-IX**. Thus, the alternative option of supply 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s may also be considered at the time of bidding.

SW.1.5. The bidder shall be required to submit a declaration (as per the format in the **ANNEXURE-XXV** of this corrigendum) where the bidder will provide a signed undertaking that they are submitting the quotation against serial no.1 of the BoQ part-I and part-II for their choice of meter.

SW.1.6. The system shall also include a HES & MDMS server application which shall be installed by the IA at Central Data Centre to fetch raw meter data and integrated with that MDMS system with associated Support Services and an Advisory service for Revenue/Service Improvement action in for the project area.

SW.1.7. The payment shall be divided into a lumpsum on delivery of the meter (CAPEX) and the rest on per meter per month basis after the implementation period (OPEX).

SW.2. The scope of this tender document is implementing and execution in TOTEX model and in broad the bidder scope shall include the followings:

SW.2.1. All Smart Meters under this scope of this project, will be installed in consumer premises scattered throughout West Bengal. Region wise, connection phase wise segregation of Consumers at present is indicated below:

NAME OF REGION	220 KV	440 VOLT	11 KV	33 KV	132 KV	Total
ALIPURDUAR	0	116	91	0	0	207
BANKURA	0	181	206	14	1	402
BIDHANNAGAR	0	761	607	58	0	1426
BIRBHUM	0	438	212	1	0	651
BURDWAN	0	353	592	6	0	951
COOCHBEHAR	0	146	85	0	0	231
DAKSHIN DINAJPUR	0	78	56	0	0	134
DARJEELING	0	476	303	9	0	788
HOOGHLY	0	570	518	48	1	1137
HOWRAH	0	777	656	51	2	1486
JALPAIGURI	0	311	341	4	1	657
MALDA	0	131	125	4	0	260
MURSHIDABAD	0	254	140	3	2	399
NADIA	0	275	143	8	0	426
NORTH 24 PGS	0	673	307	13	0	993
PASCHIM BURDWAN	0	211	481	41	6	739
PASCHIM MIDNAPORE	0	255	265	24	3	547
PURBA MIDNAPORE	1	359	142	28	9	538
PURULIA	0	168	81	5	0	254
RAIGUNJ	0	181	147	0	0	328
SOUTH 24 PGS	0	393	269	16	0	678
GRAND TOTAL	**1**	**7107**	**5767**	**333**	**25**	**13232**

Additional number of metering end-points are for licensee consumers mainly having connection voltage level of 132 kV and above.

The aforementioned quantity is indicative. Final quantity will be ascertained during the issuance of the LoA with a variation of -10% to +10% throughout the contract period, from the date of issuance of the LoA. Also, an increase of 10% in the overall new connection on yearly basis shall be there.

SW.2.2. Site survey, planning, design, engineering, manufacturing, transportation & insurance, supply, installation, testing, asset mapping, demonstration for acceptance, training, operation, maintenance, documentation of each component of the project.

SW.2.3. Supply, Commissioning of 4 or 5 (depending on choosing the option of using whole current smart meters for solar generation metering end-points as detailed in **SW.1.4.**) types of Smart Meters (3-ph Whole current with import-export mode, 3-ph LT-CT 0.5s, 11 kV 0.5s of rating 50/5, 33 kV 0.5s of rating 100/1 and 132 kV 0.2s) with compatible NIC (Network Interface Card) and deployment of HES (in Data Centre of WBSEDCL) with the integration of HES with the proposed MDMS as well as the maintenance of the system is under the scope of this project.

SW.2.4. Plug and play type communication modules shall be deployed in the Smart Meters, these

modules shall be field-deployable. The communication infrastructure should be based on 4G (with a fall-back on 2G). Communication network shall provide reliable medium for two-way communication between various nodes i.e. Smart meter & HES. SIM cards shall need to be provided by the IA from leading Telecom Service Provider in India.

SW.2.5. One Head End System (HES) shall be deployed in WBSEDCL Data Centre as per the specifications defined in this Contract. Proposed HES should be operable with the different types of smart meters (as mentioned in **SW.2.3**) with NIC having one physical SIM (preferably dual physical SIMs) or one e-SIM on 4G (fall-back to 2G) network based cellular communication.

SW.2.6. One Meter Data Management System (MDMS) shall also be deployed in WBSEDCL Data Centre as per the specifications defined in this Contract. This proposed MDMS should be operable with the proposed HES (as mentioned in **SW.2.5**) with integration between HES and existing applications like CRM, SAP-ISU, OMS, SCADA etc. as and when required by WBSEDCL through API-based model to facilitate seamless data transfer.

SW.2.7. Web portal application based on HES and MDMS interface, dashboard and various reporting on SLA and KPIs for utility users.

SW.2.8. a) Two Android based Mobile Apps (with accessories)- One for Field device installation, replacement & site survey, and another for manual meter reading and

b) Windows based 'Base Computing Software' (BCS) for processing of manual meter reading data.

c) One Consumer Mobile app

d) One portal for consumers.

e) One User portal for WBSEDCL.

SW.2.9. Supply/ Planning/ Setup of Communication Infrastructure with HES and MDMS for the project area.

SW.2.8. The IA need not provide any additional MPLS links.

SW.2.9. All other necessary software with valid licenses relevant to the Project to facilitate seamless operation of the system.

SW.2.10. Integration of different devices/equipments/software covered in scope of this project with each other as per functional requirements.

SW.2.11. Configuration, customization, testing, documentation- technical and user manuals of all deployed components and all related software.

SW.2.12. Training and handholding as per training scope and system handover after end of contract free of cost.

SW.2.13. System Security and access with due consideration of data privacy, confidentiality.

SW.2.14. Carry out site Survey of site locations to assess the following:

SW.2.14.1. Smart Meter Installation/ replacement
SW.2.14.2. Network Planning for Setting up of communication network
SW.2.14.3. Assessment of backhaul connectivity (SIM card service Provider) for data transfer from Smart Meter to HES.

SW.2.15. Bidder will be the single point of contact for implementation, maintenance of meter, communication module, application, software, integration of HES to MDMS and integration of MDMS to various Legacy systems.

SW.3. It is preferable to use the smart meter from at least three (3) different Meter manufacturers with NIC (SIM(s)/ e-SIM) in this project, to enable the respective meters to seamlessly integrate with proposed HES thus enabling interoperability of the system.

SW.4. The bidder should submit detailed implementation methodology and technical solution for this project along with names and profiles of the resources being deployed. Implement & commission system architecture capable of upgrades and scaling as per WBSEDCL requirements with robust System security features with due consideration of data privacy, confidentiality cyber security guidelines etc. The technical solution should include:

- Smart meter and NIC card details with documentation
- Technical architecture of deployed Software and applications
- Mechanism of High availability of system and backup
- Proposed approach for integrations
- Proposed approach on cyber/ data security with adherence to WBSEDCL security policy.
- Complete details of each hardware and software including license, processor, SAN storage, backup etc.

SW.5. Complete system is to be established by selected Implementation Agency (IA) within 6 months from the date of award of work and thereafter the same agency to provide support services for another 114 months.

SW.6. Bidder should go through extensive site survey within project implementation time for identification of network design (equipment locations etc.) and detailing out comprehensive exercise of required material and system architecture plan.

SW.7. Provide a working system (GO-LIVE) that meets the functional and performance requirements of specified specifications of engineering and design, specific to location including review and conformance with local environment especially with respect to communication with development of installation, commissioning and safety guidelines and procedures for the complete system. The bidder shall provide comprehensive deliverable details for successful execution of the project such as Hardware, Software, Tools etc. as desired by the WBSEDCL in this document.

SW.8. Bidder to submit it's after-sale service support plan and escalation matrix in order to meet contractual obligations and performance guidelines. Preferably, bidder should have service office in Kolkata, once the P.O. is awarded.

SW.9. The key expert's profile as declared by the bidder shall remain deployed to this project during the entire implementation period up to complete system acceptance. In case of change of resource,

the bidder shall intimate WBSEDCL in prior and can replace them with resource(s) having equal or higher skill profile subject to the approval of WBSEDCL.

SW.10. All the necessary Hardware as well as OS and application software as per requirement of the project for establishment of HES & MDMS at Central Data Centre (CDC) of WBSEDCL shall be delivered and commissioned by the IA to download/upload data from meters and integrate with the ~~existing~~ proposed MDMS. Log files shall be generated during different transactions.

i) The Hardware (Rack mounted Application & database Servers along with failover mechanism with High availability (HA), SAN Storage and switches, Backup solution, Managed Switch(es), KVM switch, Application Load Balancer, Desktops, Printer etc.) shall be deployed in CDC of WBSEDCL in an environment that shall comply with the clause **SW.20.9.**

ii) For backup, adequate hardware provisioning should be made at DRC of WBSEDCL.

iii) The sizing of the servers shall have to be decided by IA according to the project requirement with variation indicated in this document.

iv) All servers should run in a virtual environment.

v) The software including virtualization software provided for the project shall be in the name of WBSEDCL and shall have a perpetual license or be renewed as per requirement.

vi) The antivirus solution shall be provided by WBSEDCL and the applications provided by the IA shall have to be compliant to the antivirus provided by WBSEDCL.

vii) The Firewall solution shall be provided by WBSEDCL and WBSEDCL's existing infrastructure shall be used while deployment of the HES.

viii) The servers and network devices including switches etc. deployed for physical deployment of HES & MDMS system shall be able to operate in 1G/10G/25G network mode.

ix) During the maintenance of the H/W in the contract period, cost of replacement of any H/W, if any, has to be borne by the IA.

x) If the product (H/W and/or S/W) is at end of support or warranty, the IA shall replace the product at their own cost.

xi) The S/W Patches or updates shall be the responsibility of the IA and both H/W and S/W provided by IA shall adhere to WBSEDCL's security policy.

SW.11. The bidder is expected to propose latest versions of all software, hardware for the project and should be supported by OEMs for at least the whole contract period from operational acceptance test.

SW.12. The bidder is expected to propose latest versions of all software, hardware for the project and should be supported by OEMs for at least the whole contract period from operational acceptance test.

SW.13. Any software updates, upgrades, patches released till the completion of contract period shall be supplied, installed and commissioned under scope of this contract at free of cost.

SW.14. All SLAs and KPI under bidders' scope will be checked from system report of HES, MDMS and Integration BUS logs.

SW.15. The intended sub- system shall have following core components of AMI system:

a) Smart Meters;

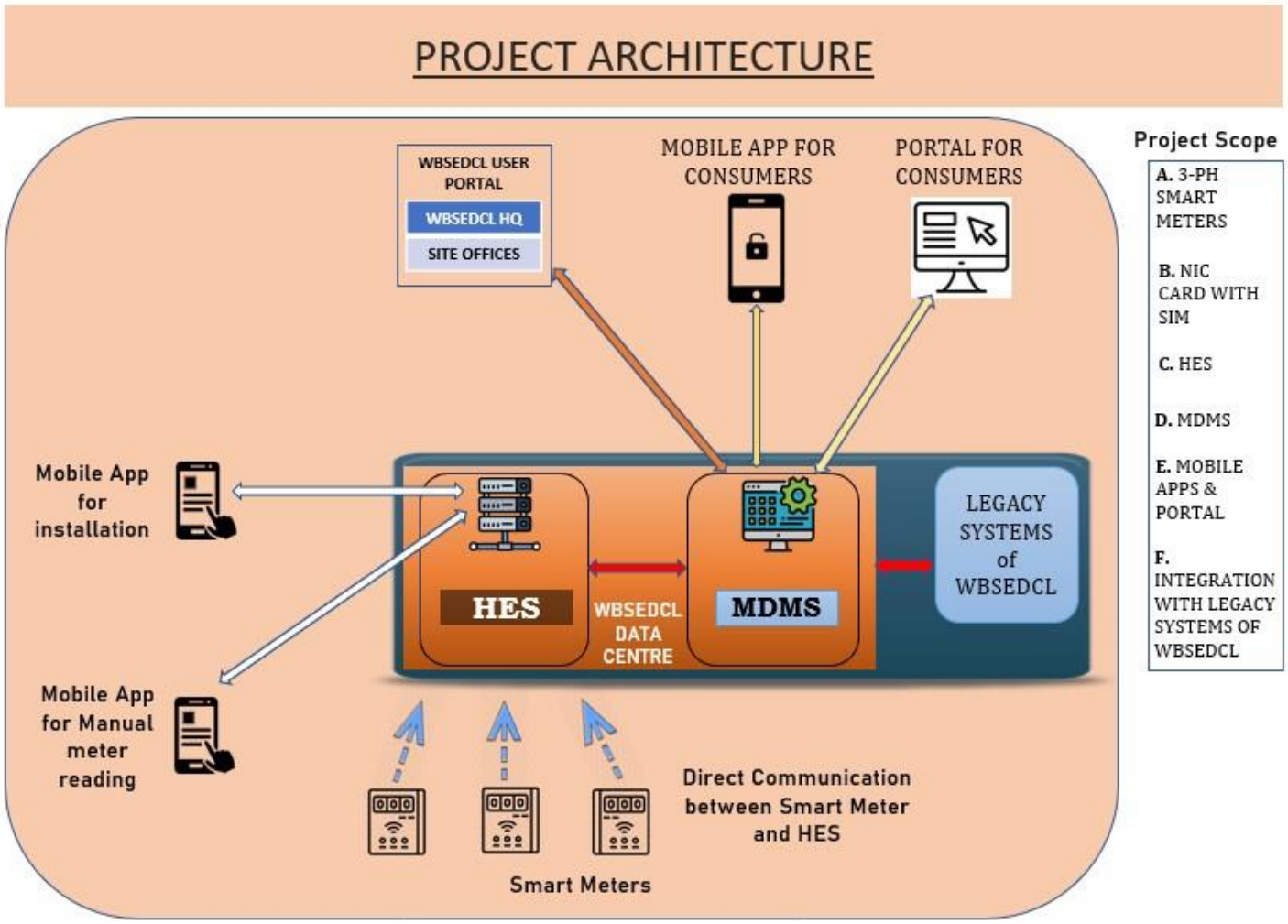
b) Communication infrastructure;

c) Head End System (HES).

d) Meter Data Management System (MDMS).
e) Two Android Based mobile apps; one for Field Device Installation and another for manual meter data downloading.
f) Mobile app and portal for Consumers.
g) Portal for WBSEDCL users with access controls and roles.
g) Windows based Base Computing Software (BCS).

All the above-mentioned components are detailed specified in Technical Specification Section.

For understanding the scope of bidder can refer to the architecture below:



The following section will describe scope of each aspect of the overall system.

SW.16. Field device installation:

SW.16.1. General rules of installation:

SW.16.1.1. The installation/re-installation of the smart meters shall be done jointly with authorized WBSEDCL personnel and IA under all Regions of WBSEDCL simultaneously.

SW.16.1.1.1 The IA shall provide all necessary activities for commissioning and connection with HES after completion of installation and energization of the meters, and

the Site Engineer or his assistant from IA shall be constantly on the Site to provide full-time superintendence of the installation.

SW.16.1.1.2. Also, IA shall provide technicians with each installation team to perform the activities but not limited to- Network configuration reset, configuration of IP settings and NIC card and for communication to HES. These teams shall be deployed across each Regional Office and CDC of WBSEDCL so that the necessary activities can be executed simultaneously. IA shall make provisions for deployment of additional teams as and when new Region Offices are created by bifurcating existing Regions of WBSEDCL.

SW.16.1.1.3 The IA shall provide and employ adequate technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand, so that the commissioning shall be carried out under the jurisdiction of all the Regions simultaneously as per the installation plan. They shall deploy at least one technical team at each Region office under the jurisdiction of WBSEDCL, so that the installation and maintenance activity can be done simultaneously under all region offices.

SW.16.1.2. Unless otherwise specified in the Contract, upon completion of the activities, the contractor shall remove from the Site all Equipment brought by them onto the Site and any surplus materials remaining thereon.

SW.16.1.3. Compliance with Labour Regulations: During continuance of the contract, the Contractor and his sub-contractors of the IA, if engaged, or IA shall abide at all times by all applicable existing labour enactments and rules made thereunder, regulations notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. The employees of the Contractor and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

SW.16.1.4. It is mandatory for the IA/contractor engaged by IA to observe during the execution of the works, requirements of Safety Rules. All safety laws, rules and regulation enforced by statutory agencies and by Utility shall be applicable in the performance of this Contract and Contractor's Team shall abide by these laws, rules and regulations.

SW.16.1.5. In case any accident occurs during the construction/ erection or other associated activities undertaken by the IA or thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor, if engaged by IA, to promptly inform the same to the Project Manager and also to all the authorities envisaged under the applicable laws.

SW.16.1.6. Emergency Work, if, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the contractor, if engaged by IA, shall immediately carry out such work. If the contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer

shall, as soon as practicable after the occurrence of any such emergency, notify the contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the contractor to the Employer. In case such work is not in the scope of the contractor, the cost of such remedial work shall be borne by the Employer.

SW.16.2. All the types of 3-ph smart energy meters should have plug-in type NIC card. Initially meters will be installed as post-paid mode (if otherwise, any instruction from WBSEDCL) and the same meter having programable Net metering facility shall be able to be configured via OTA.

SW.16.3. Meter boxes and External CT & PT shall remain outside the scope of the contract.

SW.16.4. Any meter installation will be supported by field device installation App and after meter installation/ re-installation, details of consumer connections, such as consumer identification no., Lat-long, meter ID, its hardware & software configuration, meter seal no, Old meter last reading, initial reading of new meter, name plate details, make, type i.e. 3-Phase shall be updated in the HES system.

SW.16.5. Meter installation and commissioning shall be declared completed once it is acknowledged by HES and integrated with MDMS.

SW.16.6. In case of change of meter due to defect, vendor shall supply new meters and reconfigure the installed new meter (jointly installed by both WBSEDCL & IA personnel) and database system without any extra cost.

SW.16.7. Handling of old meters along with other dismantled materials related to it shall be done from the site jointly by WBSEDCL and IA.

SW.16.8. Replacement of smart meter to smart meter (due to defects arising, meter type change, etc.) shall be carried out jointly by WBSEDCL and the IA shall carry out the following procedure:

SW.16.8.1. Taking down the old meter reading.
SW.16.8.2. Install SIM Cards in the meter & activate /register new meters with Head End System & MDMS.
SW.16.8.4. Provide or capture meter location through GPS.
SW.16.8.5. Digital photograph of meter reading before and after installation.
SW.16.8.6. Handover of attached NIC Card (if any), to the concerned personnel of WBSEDCL.

SW.16.9. For new connections, service cable till the meter installation point shall be provided by WBSEDCL.

SW.16.10. For fastening equipment and fittings to buildings only galvanized steel screws or screws made of non-corrosive material of strength shall be used.

SW.16.11. The meter shall be preferably located in a building, outside living area, suitable for physical inspection without entering into consumer's living area. However, Meter shall be

installed as per prevailing utility practice.

SW.16.12. Civil works associated with the installation of the smart meters such as pointing, grouting, mortar touch-ups, carpentry, etc., are to be done by WBSEDCL.

SW.16.13. The employer shall check on the quality of installation by checking the communication to control centre & time-lag in data acquisition & to certify for acceptance to IA.

SW.17. Meter Replacement:

SW.17.1. For any damaged or burnt consumer smart meter, it shall be replaced by the IA from the time of detection. However, in case of meter getting burnt or damaged due to reasons such as system over-voltage, lightning surge, tampering caused by consumer etc., other than the manufacturing defect(s), the cost of such replacement will be reimbursed by WBSEDCL at actuals on production of the requisite document.

SW.17.2. The meter which does not communicate to HES/ MDMS for more than three days should be visited by the vendor and reason to be identified, reported and appropriate action need to be taken by the vendor.

SW.17.3. Whenever the smart meters require to be dismantled from existing premises, whole metering system with all its accessories will be dismantled immediately and the same may be installed in the new consumer premises by WBSEDCL and IA as per clause **SW.16.1.1**. If any cable, power cord, consumable is required during the change of meters then the cost shall be needed to bear by the IA. The IA shall require updating and modifying the database and other information for these new meters without any additional cost.

SW.17.4. Any reason for no data communication due to WBSEDCL issues like issues related to electrical installation shall be immediately brought to the notice to the utility in writing and email.

SW.17.5. Any reason of delay pertaining to communication or any network issue, hardware and application software issue etc. counted on IA's part and LD will be accounted from IA's bill as per LD clause.

SW.18. Operation and maintenance:

SW.18.1. Scope and Period: The operation, maintenance, and support services start after the successful completion of the operational GO-LIVE of the system. The scope of work under operation and maintenance services shall include:

SW.18.1.1. Comprehensive Maintenance of all hardware provided by IA at WBSEDCL Data Centre for this project.

SW.18.1.2. Comprehensive maintenance of all the software (including licensing and annual technical support cost).

SW.18.1.3. Comprehensive maintenance of all hardware at the Operation and Monitoring Centre, along with field devices (like Smart Meters, NIC etc.) provided by IA under the project.

SW.18.1.4. WAN communication infra between field devices and WBSEDCL data centre.

SW.18.1.5. Future integration and support services for meeting the future expansion requirement envisaged under this project.

SW.18.1.6. Day to day operations of the AMI system under supervision and authority of WBSEDCL. These shall include among others:

i. Firmware update of remote devices (Meters) as required.
ii. Initiating resolution of incidents raised by WBSEDCL raised in CA Service Desk module used by WBSEDCL. Two users will be created for site co-ordinator of IA to resolve the issues.
iii. Ensuring availability of Billing Profile, Load Profile, Daily Midnight data in TOD form, interval data and event notifications from meters in time schedules as agreed with the utility.
iv. Ensuring scheduled completion of billing determinant calculations.
v. Ensuring daily reports from the HES system as per agreed list, are made available to utility.
vi. Ensuring smooth data traffic between the MDMS and HES systems.
vii. Ensuring smooth data traffic between the MDMS and existing legacy systems of WBSEDCL.
viii. Patch management of IA applications at WBSEDCL data centre.
ix. Provide backup data to support SLA and IA's invoicing.
x. Carry out performance checks of various functions as per agreed schedule or on demand.

The IA is to hand-hold the WBSEDCL team to take over operation, maintenance and support services after completion of contract period. The project/ system devices should allow their functionalities to be upgraded without disruption to the existing functionalities by downloading new software and configuration information.

SW.18.2. IA's Responsibilities under Operation & Maintenance Services:

The IA shall make available the following man-power resources at the utility's Network Operations cum Monitoring Centre,

a) One Project Manager cum Supervisor,
b) Two Operation Staffs.

Other than that, 5 site engineer-cum-supervisors deployed in each of the 5 zonal offices of WBSEDCL to monitor Site work. Whenever new zones are created by bifurcation of exiting zones of WBSEDCL, additional site engineers will be needed to be deployed by the IA accordingly.

The above-mentioned operation and support staff shall be made available for 12 hours a day, if required, in two shifts, six days a week barring national holidays. Also, Bidder need to deploy other resources as per requirement of the project to meet SLA.

SW.18.3. Maintenance Practices: For all third-party equipment (Hardware & Software), IA shall have back-to-back support along with supply of spare with appropriate response time from OEM/OEM Authorized representatives. IA shall be responsible for coordination with the OEM for all matter related to equipment. The maintenance practice followed by IA shall be in accordance with best industry practices and must include the following:

a) Scheduled preventive maintenance, performance monitoring, system backup and restore, hardware & software maintenance and update, field & network devices firmware

update, emergency response and troubleshooting etc.
b) Maintaining adequate spares for maintenance.

SW.18.3.1. Preventative Maintenance Activity: The preventive maintenance activities shall be performed by the IA to keep the system running at optimum level by diagnosis and rectification of all hardware and software failures and would broadly include:

a) Repair / replacement of defective equipment.
b) Configuration of the replaced hardware and software, periodic routine checking as part of a preventive maintenance program.
c) Monitoring of the performance of the system and doing necessary tuning for optimum performance to accommodate any changes such as addition of new components.
d) Providing all necessary assistance to WBSEDCL for addition and modification of utility user interface, App displays, and Database.
e) Ensure Backup of the system at regular intervals with at least one localised and another copy of the same should be kept at DRC of WBSEDCL.
f) Restoration of the systems upon its failure and to restore the functioning of the various application / systems at WBSEDCL data centre.

SW.18.3.2. Integration of Equipment: All future services, protocol emulations and configuration support for integration of Smart Meters/ nodes, network devices, web services, integration with other offline applications etc. shall be the responsibility of IA and shall be part of the maintenance activities.

SW.18.3.3. Spares inventory: As part of project implementation plan, the IA shall detail the spares inventory that shall be maintained for the Project. These spares shall be used as and when required by the IA for the project and no separate charges shall be payable. The IA shall decide the items and components to be maintained as spare.

SW.18.4. Physical Maintenance: The IA shall undertake physical maintenance of all equipment/modules under the scope of this contract, in accordance with the schedule as indicated by IA in project implementation plan. The physical maintenance shall include cleaning, dusting, inspection of equipment for loose connections, damage to insulation, pest infections etc. Equipment shutdown during preventive maintenance shall be deemed as available.

SW.19.Monitoring: The proposed system is expected to provide continuous online monitoring and logging, analyse the results and submit report (capability to generate spread-sheet and MIS report) to WBSEDCL.

SW.19.1. System Monitoring:

SW.19.1.1. HES system error history logs or selected day.
SW.19.1.2. Each Integration node log monitoring for each action.
SW.19.1.3. System outage/downtime.
SW.19.1.4. Field & Network device failure – rate and trends.
SW.19.1.5. Tamper information.
SW.19.1.6. Availability of communication link of meter.
SW.19.1.7. Missing meter data – rate and trend.
SW.19.1.8. Any other customized forms/reports as required by the utility.

SW.19.1.9. Remote firmware upgrades information with versioning.

SW.19.2. Resource Monitoring: Resource Monitoring services comprise checking the system's major node resources, gather log data, analyse results, and report utility on the appropriate actions to be taken and undertake any agreed upon actions. The system shall be able to continuously collect the following information:

SW.19.2.1. CPU loading (Peak and Average).
SW.19.2.2. Memory utilization (Peak and Average).
SW.19.2.3. Disk utilization (Peak and Average).
SW.19.2.4. Operating system resource utilization reports.
SW.19.2.5. System error log.

SW.20. System Design Requirements: The proposed solution should comply following basic design principles:

SW.20.1. Open and Industry Standards for Interoperability: The proposed solution must have highest degree of interoperability and the solution components shall be standard based and adopt an open approach rather than support a specific technology.

SW.20.2. Software Standards: All software provided by the IA under this tender document, including the operating system, database and support software, shall comply with the industry-accepted software standards. In areas where these organizations have not yet set standards, the software shall comply with those widely accepted de-facto open standards put forth by industry consortiums, such as Open Software Foundation (OSF) and X/Open. The IA shall commit to meet the "open systems" objective promoted by industry standards groups.

SW.20.3. Design and coding Standards for Applications: These provisions are applicable for both software applications and operating systems and would address program features that must be contained in software for the product to meet the standards:

SW.20.3.1. When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be distinguished textually.

SW.20.3.2. A well-defined on-screen indication of the present focus shall be provided that moves among interactive interface elements as the input focus changes.

SW.20.3.3. Applications shall not override user selected contrast and colour selections and other individual display attributes.

SW.20.3.4. When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.

SW.20.3.5. Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.

SW.20.3.6. All components of AMI application system shall be maintainable by owner using the supplied software utilities and documentation. The software design and coding standards of the system shall address the followings:

• Expansion: Software shall be dimensioned to accommodate the size of AMI application system keeping the scalability in count.

• Modularity: Software shall be modular i.e. functionally partitioned into discrete, scalable, reusable modules consisting of isolated self-contained functional elements and designed for ease of change. The system shall make maximum use of common industry standards for interfaces.

• User-Directed Termination: Functions taking long execution times shall recognize and process user requests to abort the processing.

• Portability & Interoperability: The system shall be designed for hardware independence and operation in a network environment that facilitates interoperability and integration of third-party application.

• Programming Languages: The software shall be written using high level ISO or ANSI standard programming languages.

• All applications shall be designed with sufficient background logs which capture various level of errors encountered (warning, fatal, informational) while executing, so that the same can be reviewed and attended to.

SW.20.3.7. Remote Diagnostic: Remote Diagnostic facility with necessary hardware and software as required shall be provided for communication between the AMI application system at the WBSEDCL data centre and the Network Operation cum Monitoring Centre and the WBSEDCL support office for the diagnosis of hardware & software problems. The login shall be protected by a username & password entry. An automatic logging and intimation shall be provided to inform authorized person from WBSEDCL on such events of remote access and diagnosis.

SW.20.4. Service Oriented Architecture (SOA): Solution components must follow SOA principles to provide specific services using well defined interfaces. The system solution design shall be based on cross-functional components or subsystems and shall be implemented in such a way that there is an opportunity for reuse. The integration architecture shall be based on the concept of a service, so all the applications of the HES solution are able to integrate without any complexity. Data access must be always through Services, no application will access HES data directly from the storage layer or data access layer. For every internal data access also (access between various modules) there will be services and no direct access will be there to ensure the system is scalable and secure.

SW.20.5. Solution Integration:

SW.20.5.1. Shall easily integrate to the proposed MDMS of WBSEDCL using API.

SW.20.5.2. The AMISP's core deliverables are the MDM, the HES, and the smart field devices (Smart Meters). Hence the system integrations shall comprise of the following:

i) HES with field devices (Smart Meters)
ii) MDMS with:
    a) HES
    b) Billing
    c) Other legacy IT/OT systems as required by Utility
    d) National level Reporting Platform, if comes up in future.

SW.20.5.3. MDMS Integrations with Utility IT/OT Systems: The MDMS will act as the bridge to integrate the AMI system with other utility IT/OT systems. These IT/OT systems may be already existing or those which the Utility have planned. The IT/OT systems may include but not be limited to the following:

i) Billing, CIS, IVRS, CRM systems
ii) Manual reading system using mobile app.
iii) Consumer Portal/ App
iv) GIS
v) SCADA/OMS
vi) Peak Load Management (PLM), Demand Response Management System (DRMS)
vii) Asset Management System
viii) Work Force Management System (WFMS)
ix) Electric Vehicle Supply Equipment (EVSE)

SW.20.5.4. The integration is expected to be on on-line real time basis or batch mode where appropriate and shall operate in an automated fashion without manual intervention.

SW.20.5.5. The integration mechanism adopted must have minimal impact on the existing systems. The access to data will only be through applicable business rules i.e. the applications will not access data directly without going through APIs managed by business rules/validation/workflow.

SW.20.5.6. It will be necessary to integrate the MDMS with the utility IT/OT systems following robust industry standard mechanisms.

SW.20.5.7. MDMS shall interface with these IT/OT systems using API. The aim of the above interface standards is to ensure generic two-way interfacing of the MDMS with other applications.

SW.20.5.8. In case, utility adopts any Integration Middleware/ Integration Service Bus then the data exchange to and from HES shall be through this SB.

SW.20.5.9. HES should maintain log for every in out command/ request/ push transaction between MDMS and HES system.

SW.20.5.10. All Meter profile data (**clause SW.22**) shall be sent in a single payload for each individual meter irrespective of push and pull mechanisms.

SW.20.6. Key Data Management:

SW.20.6.1. The system must store and manage the security information related to Smart Meters. This include Device Security keys and asset information for processing further business flows.

SW.20.6.2. Update of HES with the necessary asset information of all AMI filed devices.

SW.20.6.3. The system must ensure that at all times the field data (customers, meters, etc.) shall be in sync across MDMS.

SW.20.6.4. The System should accurately maintain system time synchronization across all devices to ensure accuracy of data.

SW.20.7. Business Continuity and Disaster Recovery: The virtualization mechanism shall be designed in such a way that in case of failure of one or multiple physical box shall not hamper the operation and function of the application and the database and should run from other working boxes. In case of Failures of Storage at DC, DR Backups shall be used to restore the Database from the last backup taken as defined in Backup policy. Bidders are expected to keep the above issues in mind and propose technically best alternative to ensure that the system is available for the users in all times by conceptualizing various scenarios and explaining how their solution addresses all the possible scenarios.

SW.20.8. Support for Hardware & Software: All servers, applications, and IT components shall be hosted in WBSEDCL CDC with uninterrupted services on 24x365 days basis.

SW.20.9. System Environments: The configuration – including application, database and communication servers shall support the following environments:

SW.20.9.1. Development environment
SW.20.9.2. Testing Environment
SW.20.9.3. Training Environment
SW.20.9.4. Production environment
SW.20.9.5. Backup system (Only for Production system).

SW.20.10. Security Zones Deployment: The IT Infrastructure will have multiple security layers to secure the infrastructure from threats. The proposed deployment has different security zones as briefed below and all zones shall have separate firewall in addition to the external (Perimeter security appliances). The firewall policies shall be configured based on zone-based requirements.

SW.20.10.1. Zone for Production Servers (Database and Application servers) Zone: This zone shall not be accessible from Internet directly. All user traffic will to enter in this security zone after firewall only. The proposed solution will have provision of dedicated Internal Firewall to secure the critical production (Data base and Application)

environment.

SW.20.10.2. Web server/Application: This security zone will host all servers that can be accessed from external users after authentication and traffic filtering. This zone shall host the Web servers, Access control and sign on servers, Antivirus Server etc.

SW.20.10.3. Testing and Development Zone: This zone will host all servers required for test and development for applications, which shall provide testing facility for integration of changes/modifications of the HES application and new field devices before putting it online with Real-time system. This zone will have limited access and it will not have any direct access to Production Servers Zone and the activity shall be monitored.

SW.21. Cyber Security: The complete system should have adequate cyber security measures not limited to the measures as described below:

SW.21.1. Secure Access Controls: The system shall include mechanisms for defining and controlling user access to the operating system environment and applications. Measures such as password policy, password strength, password aging, and password history and reuse prevention must be implemented.

SW.21.2. Authorization Controls: A least-privilege concept such that users are only allowed to use or access functions for which they have been given authorization shall be available.

SW.21.3. Logging: Logs must be maintained for all attempts to log on (both successful and unsuccessful), any privilege change requests (both successful and unsuccessful), user actions affecting security (such as password changes), attempts to perform actions not authorized by the authorization controls, all configuration changes etc. Additionally, the access to such logs must be controlled in accordance to the least-privilege concept mentioned above, so that entries may not be deleted, accidentally or maliciously.

SW.21.4. Hardening: All unnecessary packages must be removed and/or disabled from the system. Additionally, all unused operating system services and unused networking ports must be disabled or blocked. Only secure maintenance access shall be permitted and all known insecure protocols shall be disabled.

SW.21.5. Malicious Software Prevention: Implementation of WBSEDCL provided anti-virus software and other malicious software prevention tools shall be supported.

SW.21.6. Network Security: The network architecture of the HES must be secure with support for firewalls and encryption. The system shall also allow host-based firewalls to be configured, as an additional layer of security if the network firewall were to fail.

SW.21.7. End to End Security: Data in-flight must be signed and encrypted to guarantee integrity and no tampering once the data is extracted from a meter until the same data gets delivered into the HES in the backend.

SW.21.8. Cyber Security System Monitoring: The IA shall also be responsible for

monitoring of the cyber security system. The logs of the system shall be analysed for exceptions and the possible incident of intrusion/trespass shall be informed to the utility. The monitoring shall encompass the various cyber security devices installed at WBSEDCL Data Centre such as firewalls, Intrusion prevention system (both network-based and host-based), routers etc with the help of network team of WBSEDCL Data Center. The IA shall monitor and continuously collect the above logs. The IA should adhere to the cyber security policies and procedures adopted by WBSEDCL to uphold the security of the system. As WBSEDCL is an ISO 27001: 2013 certified organization, the IA should take necessary actions to maintain the standards of ISO including change management (Form to be submitted for such changes vide as provided in **ANNEXURE-XXIII**), incident management (using incident management application of WBSEDCL), patch management etc.

The IA shall also need to provide necessary actions for integration of logs to the SOC of WBSEDCL in future.

SW.22. Periodicity of data collection:

Sl. No.	Parameters	3-Ph smart energy meters
1	Name Plate	Node reboot
2	Billing Profile Data	Monthly
3	Load Profile data	Daily
4	Instantaneous data	8-hour interval daily
5	Daily profile data (Midnight Data in TOD form)	Daily
6	Critical event alarms	On Occurrence/ On Restoration
7	All event as info	Daily
8	Programmable parameters	On-demand

SW.22.1. Billing Profile Data: 100% data for billing is to be ensured by the vendor in every month. Billing Schedule:

Sl. No.	Billing profile data	Allowable day for data transfer
1	Meter data with the MD reset value	Within 2nd Day of Each Month

SW.22.2. Daily Profile data (Midnight Data in TOD form): 100% data for midnight data is to be ensured by the vendor in every month. The schedule:

Sl. No.	Midnight data	Allowable day for data transfer
1	Midnight Data in TOD format	Within 24 hours

For temporary disconnection/ permanent disconnection if billing data could not communicate, vendor need to intimate the respective Region offices in written and email with copy to WBSEDCL HQ, then only it will be justified for SLA clause. For permanent disconnection, such meter installation shall be utilized elsewhere and intimated to the vendor for further actions towards inducting this re-utilized meter in the AMI system.

SW.23. System Performance Measures: Apart from the functionalities of each component and business requirements following parameters are specified for system designing, and system optimization:

SW.23.1. Performance Requirement for User Interface (HES):

Sl. No.	User interface requirements	Response time
1	Any real time display/application display on work station console along with data values shall appear on screen.	Within 5 sec
2	Manual data entry of the new value appears on screen	Within 5 sec
3	Display Update rate	Within 5 sec
4	Response time for display of Alarm and event after receipt in system	Within 2 sec of system receipt
5	Requests for generation of reports (to be acknowledged with an indication of request is being processed)	Within 5 sec

SW.23.2. Performance Requirement for Smart metering System: Refer to SAT testing Criteria.

SW.23.3. Performance Requirement for HES Scalability: Above performance criteria should not be affected up to 23,650 + 10% meters integrated with HES.

SW.23.4. Concurrent/ Simultaneous Users:

Sl. No.	Particulars	Count
1	Expected Concurrent HES business users	50
2	Expected Concurrent Meter Installation App user	50
2	Expected Concurrent Manual Meter Reading App user	50

SW.24. Project Management:

SW.24.1. General Requirements: The IA shall assign a project manager with the authority to make commitments and decisions that are binding on the bidder. WBSEDCL will designate a Nodal officer to coordinate all project activities. All communications between utility and the Vendor shall be coordinated through the project managers/ nodal officer. The project managers shall also be responsible for all communications between other members of the project staffs including sub- contractor, if any.

SW.24.2. Project Schedule: The detail project implementation schedule shall be submitted by the Bidder after award for WBSEDCL's approval, which shall include at least the following activities:

SW.24.2.1.1 Installation Schedule
SW.24.2.1.2 Factory & Site Testing Schedule
SW.24.2.1.3 Implementation Schedule component wise
SW.24.2.1.4 Integration schedule
SW.24.2.1.5 UAT Schedule
SW.24.2.1.6 Training schedule
SW.24.2.1.7 Detailed list of Software, Hardware specifications
SW.24.2.1.8 Documents, Data Requirement Sheet, Proposed system architecture
SW.24.2.1.9 SLA reports, Monthly reports, Resource Deployment plan

The project implementation schedule shall include the estimated period for completion of each component, FAT & UAT testing and its linkage with other activities.

SW.24.2.2. Progress Report: A progress report shall be prepared by the project manager for each month against the activities listed in the project schedule. The report shall be made available to Utility on a monthly basis, e.g., the 10th day of each month. The progress report shall include all the completed, ongoing and scheduled activities and transmittals issued and received for the month.

SW.24.2.3. Transmittals: Every document, letter, progress report, change order, and any other written transmissions exchanged between the Vendor and utility shall be assigned a unique transmittal number. The Vendor shall maintain a correspondence index and assign transmittal numbers consecutively for all Vendor documents. Utility will maintain a similar correspondence numbering scheme identifying documents and correspondence that utility initiates.

SW.24.2.4. Review Meeting: Progress meetings shall be scheduled by the utility and attended by the Project Manager each reporting period to review progress of the project. Progress meetings shall be used to review the progress report, written correspondence exchanged since the last meeting, and open action items. The Vendor shall also attend technical meetings as and when required by WBSEDCL to discuss technical aspects of the project and to review Utility comments on documents. When appropriate, these technical meetings shall be conducted as extensions to the progress meetings.

SW.24.2.5. Document Review and Approval Rights: To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the Bidder shall submit documentation describing the systems to the Utility for review and approval. The employer will respond with written comments to the Bidder within thirty (30) Working days after receipt of the documents. Documents requiring correction must be resubmitted by the Bidder to the employer within thirty (30) working days. The employer will respond to resubmitted documents within fifteen (15) working days after receipt of the document. No implementation schedule relief is to be implied for documents requiring correction and resubmission to the employer. The employer shall have the right to require the Bidder to make any necessary documentation changes at no additional cost to the employer to achieve conformance with the Specification. Any purchasing, manufacturing, or programming implementation initiated prior to written the employer approval of the relevant documents or drawings shall be performed at the Vendor risk. Review and approval by the utility shall not relieve the Vendor of its overall responsibilities to satisfy system functions and performance requirements in accordance with the Specification. To help the utility manage the review and approval of documents during any given period, the bidder shall stagger the release of documents over the time allocated in the project schedule. The number and size of documents shall be factored into the document release schedule. At any time, not more than five (5) documents shall be submitted to the employer for review and approval.

SW.25. Key Resource Planning: The bidder should have minimum 12 technical persons on roll of the company having relevant experience. The key expert's profile as declared by the bidder shall remain deployed to this project during the entire implementation period with successful 'GO-LIVE' of

entire system. The Bidder must demonstrate that it will deploy at least the following personnel for the key positions that meet the following requirements:

SW.25.1. Resource qualification/ Experience criteria:

The IA shall appoint at least the following personnel dedicated for the Project:

1. **Project Manager:** She / he shall have the authority to make commitments and decisions that are binding on the IA. The project manager should be an expert in AMR/AMI Implementation including metering and related aspects, installation and management of Smart Meters, communication network, last mile connectivity, HES and MDM. The project managers shall be responsible for all communications between other members of the project staffs including sub-contractors, if any.
2. **Site Engineer:** The Site Engineer should be an expert in installation and management of Smart Meters, communication network, last mile connectivity and they will manage overall installation and commissioning of field devices. 5 Site Engineers will remain stationed at each WBSEDCL's zone office location wise for the complete project engagement period. Whenever new zone(s) is created by bifurcation of existing zones of WBSEDCL, additional site engineers shall need to be deployed accordingly by the IA.
3. **Metering Expert:** An expert in metering, metering IS, meter testing, different meter tamper or events and can manage different metering related issues ensuring availability of different meter data as per standards.
4. **System Administrator:** An expert in system administration will monitor different resource utilization by applications, define and monitor different services of HES.
5. **System Integration Expert:** An expert in System Integration covering application software, hardware and network installation, integration design and ability to manage multiple partners with different skill sets in different technology domains.
6. **Application Domain Expert (HES):** An expert must be having experience in HES installation & maintenance, configuration and Integration and between HES & MDMS.
7. **Application Domain Expert (MDMS):** An expert having experience in MDMS installation & maintenance, configuration and integration between MDMS and existing legacy systems should be considered for this role.
8. **Mobile App & portal Expert:** An expert having experience in mobile app and portal development.

Sl. No.	Position	Nos.	Min. Qualification	Min. work experience	Min. relevant work experience
1	Project Manager	1	Graduate in Electrical/Electronics & Communication	15	5
2	Site Engineers	5		5	2
3	Metering expert	1		5	2
4	System Administrator	1	MCA/B.E./B. Tech Electronics & Communication/Computer Science/IT	5	2
5	System Integration expert	1		5	2
6	Application Domain expert (HES)	1		5	2

7	Application Domain expert (MDMS)	1		5	2
8	Mobile App & Portal Expert	1		5	2

SW.25.2. In addition to the above, IA shall deploy technical staffs as per clause **SW.16.1.1**.

SW.25.3. The Bidder shall provide the CVs of the proposed personnel in the relevant Forms included in **ANNEXURE-XI** Sample Forms of the bidding documents.

SW.25.4. For the field activities, bidder shall propose a detailed Man-power Deployment Plan with the technical bid document.

SW.25.5. Above mentioned requirements are minimum, however for all field activities and requirements to meet the project timelines, bidder to propose their project team.

SW.25.6. Deployed Key Personnel's can be replaced from the assignment only with a person of similar/higher experience and qualification subject to approval from WBSEDCL.

SW.25.7. Bidder to submit a detailed resource deployment plan for the entire project timeline.

SW.25.8. WBSEDCL has all rights to reject any under qualified, low experienced resource at any time.

SW.26. Reporting and Analytics Requirement:

SW.26.1. Complete system/ HES System shall provide following daily, weekly and monthly performance and analytical reports. Reports should be system generated only and can be exported in various formats such as HTML, PDF, CSV, XLS. The scope shall include but not limited to the requirements given elsewhere in the Technical specification.

WBSEDCL reserves the right to add to the list in consultation with implementing agency without any additional financial liability to the utility.

Sl. No.	Description of report/analytics	Frequency
1	Metering Report: Count of data against different profile parameters.	Daily
2	Meter Billing data availability with AMI and Manual flag	Monthly
3	Meter analytical data availability report.	Daily
4	Exception reports for consumers where data have been collected manually	Daily
5	Message Log Report – Events & Alarms.	Daily
6	Theft and Tamper Alert: as per IS 15959 Part 2 Report	Daily, Monthly and User Selectable Time Period

7	Tamper event analysis with snapshot values	Daily, Monthly and User Selectable Time Period
8	Load Survey analysis to analyse the loading pattern of a consumer	Daily, Monthly and User Selectable Time Period
9	Consumer and Region-wise meter failing events	Daily, Monthly and User Selectable Time Period
10	Low current, low voltage, abnormal frequency and phase angle error analysis	Daily, Monthly and User Selectable Time Period
11	Monthly energy consumption report and analysis	Monthly
12	Region-wise CT/PT anomaly analysis	Monthly
13	Billing profile of suspected consumers	Monthly
14	Consumer-wise Trend Record Demand vs Billable Demand analysis	Monthly
15	Report for Calculated Demand (kVA) based on Load Survey data	Daily, Monthly and User Selectable Time Period
16	Consumer-wise Trend Max recorded Demand analysis	Monthly
17	Power failure report analysis	Monthly
18	Report No. of exception cases listed for investigation	Monthly
19	Derived Phasor Diagram of a meter based on Instantaneous Data	Daily
20	Billing analysis with graphical representation and interface	Monthly
21	Monthly revenue summary report	Monthly
22	Consumption report as per slab of consumption	Monthly
23	Monthly & yearly trend analysis of change in consumers, consumption trend, CD trend, Load Factor, Revenue/Payment trend	Monthly
24	Consumer-wise Deviation analysis against historical consumption trend	Monthly
25	Interruption details analysis	Monthly
26	GPRS outage report and analysis	Monthly
27	Voltage Deviation Index and Frequency Deviation Index	Daily
28	Comparison Consumption (system used to detect & track theft suspects)	Daily, Monthly and User Selectable Time Period
29	Consumption lower than the expected pattern (pattern of previous year applied to the monthly average) or monthly average	Monthly
30	Low Power Factor	Daily, Monthly and User Selectable Time Period
31	Meter Current Unbalance	Daily, Monthly and User Selectable Time Period

32	Availability Report of HES, MDM Interface/ Integration Bus, and network components	Daily
33	Count of On-demand Meter Read request with Success/ Fail Polling Flag	Daily, Monthly and User Selectable Time Period
34	Report on Meter Firmware upgradation request with Success/ Fail Flag	Daily, Monthly and User Selectable Time Period
35	Report on all type of Service Order from MDMS/ HES with timestamp	Daily, Monthly and User Selectable Time Period
36	Availability Report of HES, Meter Installation app, Meter Reading App, MDMS etc.	Daily
37	Availability Report of utility application, dashboard and other management services.	Daily
38	Authentication Failure Report	Monthly
39	Unauthorized access report	Monthly

SW.27.Documentation Scope:

SW.27.1. General: To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the Vendor shall submit documentation to utility describing the systems for review and approval. Further the Vendor shall also submit the drawings / documents for all the hardware & software required for installation, testing and commissioning and thereafter operation of the system. The Vendor shall obtain approval of utility for the relevant document at each stage before proceeding for purchase, application development, system deployment, testing, training etc.

SW.27.2. Instructions: Documents shall have unique identification No. and every revision shall be mentioned. The Vendor shall submit three (3) hard copies of each document/drawing for Utility's review and approval along with soft copy with each submission. After approval two (2) sets of all the documents shall be submitted as final documentation. Any changes observed during field implementation shall be incorporated in the as-built drawing and two copies of same shall be submitted to utility on electronic media in pdf format. The Vendor shall also supply two (2) sets of Technical User manuals/guides/O&M manuals/manufacturers catalogues for all the hardware & software supplied under the contract. The user manual shall at minimum include the principle of operation, block diagrams, troubleshooting and diagnostic and maintenance procedures. Considering all the components of the system the following documents/drawings shall be required under the system.

SW.27.3. Hardware Documentation Requirements: The following document shall be submitted as applicable for the subsystem:

SW.27.3.1. System description documents (Overview).
SW.27.3.2. Data requirement sheets for all items.
SW.27.3.3. Functional description document.
SW.27.3.4. Database documents.
SW.27.3.5. Drawings/Documents for manufacturing/assembly of the equipment/system
SW.27.3.6. Drawings/Documents for installation of the equipment/system at site.

SW.27.3.7. Installation Progress Document: Including documentation of date of installation, make and meter ID of existing replaced meter, meter ID of new meter, consumer account number, GPS coordinates, unmetered connection, existing meter status (OK, failed, meter tampering), line theft, etc. Wherever applicable, Vendor may, for recordkeeping, take photographs/ videos of installation site on approval from WBSEDCL Software description/design documents for each module.
SW.27.3.8. Factory test procedure and report.
SW.27.3.9. Manuals for each and every equipment.
SW.27.3.10. System configuration parameter.
SW.27.3.11. Site testing procedure and report.
SW.27.3.12. Training documents.
SW.27.3.13. System administrator documents.
SW.27.3.14. User guide.
SW.27.3.15. Software licenses.
SW.27.3.16. Type test reports.
SW.27.3.17. Cable sizing calculations.
SW.27.3.18. Inventory of the hardware.
SW.27.3.19. General and internal arrangement drawing of panels indicating modules, components location etc.
SW.27.3.20. Installation drawing.
SW.27.3.21. Schematic drawing.

SW.27.4. Software Documentation Standards: The documents to be submitted shall include the following information.

SW.27.4.1. Software Inventory: An inventory of all software shall be maintained by the IA. The IA shall submit the following inventory lists: the preliminary inventory list at the time of the Functional Description document approval, an updated inventory list immediately prior to the start of the testing, and the final inventory list at the time of system commissioning. The inventory shall include the name of each program, a cross reference to pertinent Vendor documents, language and libraries used, and an indication of whether the program is to be standard, modified, or custom.

SW.27.4.2. Functional Description: Functional description documentation shall be provided for each function described in this specification. It shall include the following information for each function:

SW.27.4.2.1 Introduction describing the purpose of the function with references to other documentation to aid the reader's understanding of the functions performed.

SW.27.4.2.2 Performance requirements that describe the execution periodicity and the tuning parameters that control or limit the capabilities of the software.

SW.27.4.2.3 Complete description of the operation, data and logic interfaces with other functions.

SW.27.4.2.4 Sample displays where applicable.

SW.27.4.3. Software Design: Software design documentation shall be provided for each function before the Acceptance Test. It shall include detailed descriptions of the following items.

SW.27.4.3.1 The overall organization and architecture of the software logic such as a breakout of the software into software modules.

SW.27.4.3.2. Mathematical algorithms and formulae.

SW.27.4.3.3. Complete description of the algorithms, operation and the data and logic interfaces with other functions.

SW.27.4.3.4. Data dictionary in which the following (as applicable) information for each data item in tables, file, and array is provided: (1) Name (2) Purpose, (3) Location, (4) Length of data item, and (5) Initialization.

SW.27.4.3.5. Databases internal and external to the software, along with a description of all inputs required and the output produced by the software modules.

SW.27.4.3.6. Interfaces with other software modules.

SW.27.4.3.7. Design limitations such as field-length and the maximum quantity of data items that can be processed.

SW.27.5. Database Documentation: Database documentation shall describe the structure of the database. The documentation shall define the individual elements (files, records, fields, and tables) and their interrelationships. Portions of the database developed specifically for Owner's systems shall be identified. Documentation shall also be provided that instructs the user in the preparation of data to be used for the databases, including:

SW.27.5.1. The overall organization of input records.

SW.27.5.2. The format of each data record.

SW.27.5.3. Each data field and the valid entries pertaining to the fields.
Sufficient database documentation shall be provided to enable the database to be updated or regenerated when inputs are changed and added, programs are modified, and new programs are added.

SW.27.6. User Documentation: User documentation shall contain detailed operating instructions and procedures. Instructions and procedures shall be explained step-by-step with an explanation of how each step is performed, which parameters can be adjusted, and the effects obtained by varying each parameter. Additionally, the user documentation shall describe:

SW.27.6.1. All user guidance and error messages, along with the steps necessary to recover from errors.

SW.27.6.2. The user interface including displays and keyboard operations used to control, review the input and output produced by the function. All displays relevant to the function shall be included along with a description of each dynamic display field.

SW.27.6.3. Alarms and messages issued by the function and the conditions under which they are generated.

SW.27.6.4. Procedures those are required to be followed for computer system restarts, failures, and failovers.

SW.27.7. System Administration Documentation: System administration documentation shall be provided to guide utility personnel in the operation and procedures required to generate and update the systems, including system software, database, application software and other elements of the systems. System administration documents shall be provided for the following items:

SW.27.7.1. System performance monitoring.
SW.27.7.2. System restart/failover management and diagnostic procedures.
SW.27.7.3. System generation and management.
SW.27.7.4. Database generation and management.
SW.27.7.5. Display generation and management.
SW.27.7.6. Report generation and management.
SW.27.7.7. Diagnostic programs.
SW.27.7.8. Software utilities.
SW.27.7.9. Software maintenance.
SW.27.7.10. Application software parameters and tuning guides.
SW.27.7.11. Web administration.
SW.27.7.12. Other vendor supplied system software not included above.

SW.27.8. Test Documentation: Documentation for all type of component and overall system tests shall be provided.

SW.27.9. Training Documentation: Training documentation shall be provided for all courses in accordance with the requirements.

SW.28. Test and Inspection: This test and inspection clause is applicable to for complete system and its sub-components, unless some special testing is mentioned for any sub-components (Meter) of the project. All the materials which will be supplied shall undergo pre-dispatch inspection by WBSEDCL officers. Before supply of items, clearance from WBSEDCL is required.

SW.28.1. Test Plans & Procedures: Test plans and test procedures shall be provided by the IA, for all tests to ensure that each factory and field test is comprehensive and

verifies all the features of the equipment are tested. The IA shall prepare detail testing procedure in line with specification. The procedure shall be modular to the extent possible, which shall facilitate the completion of the testing in the least possible time. During the development of test plans and test procedures for the system, emphasis shall be placed on testing each conditional logic statement, checking error conditions, and documenting the simulation techniques used. The test plans and test procedures shall be modular to allow individual test segments to be repeated as necessary.

SW.28.1.1. Test Plan: The test plans shall describe the overall test process, including the responsibilities of individuals and the documentation of the test results. The following shall be included in the test plans:

(a) Test schedule on a day-by-day basis.
(b) Responsibilities of test engineer and WBSEDCL personnel.
(c) Record-keeping assignments, procedures, and forms.
(d) Procedures for monitoring, correcting, and retesting variances.
(e) Procedures for controlling and documenting all changes made to the hardware and software after the start of testing.
(f) Block diagrams of the hardware test configuration, the external communication channels, and any test or simulation hardware.

SW.28.1.2. Test Procedure: The test procedures shall describe the individual tests segments and the steps comprising each segment, particularly the methods and processes to be followed. The test procedures shall include the following items:

(a) Name of function to be tested;
(b) References to the functional, design, user, and any other documents describing the function;
(c) List of test segments to be performed and the purpose of each test segment;
(d) Set-up conditions for each test segment, including descriptions of the test equipment;
(e) Descriptions, listings, and instructions for test software tools and displays if any;
(f) Step-by-step descriptions of each test segment, including user actions for each test step;
(g) Expected results for each test segment, including pass/fail criteria;
(h) Descriptions of the techniques and scenarios to be used to simulate system field inputs and controlled equipment;
(i) Copies of any certified test data to be used in lieu of testing.

SW.28.1.3. Test Records: The complete record of all factory and field acceptance tests results shall be maintained by the designated Project Manager of IA. The records shall be maintained in a logical form and shall contain all the relevant information. The test reports shall be signed by the testing engineer and the engineer witnessing the tests. The records shall be keyed to the test procedures. The following items shall be included in the test records:

(a) Reference to appropriate test procedure;
(b) Date and Place of Test;
(c) Description of any test conditions, input data, or user actions differing from that described in the test procedure;
(d) Test results for each test segment including a pass/fail indication;
(e) Identification of test engineer and WBSEDCL's representative;
(f) Provision for comments
(g) Copies of any variance reports generated
(h) Copies of reports, display copies, and any other hardcopy generated as part of the test.

SW.28.1.4. Reporting of variances: Starting from the dry-run test period, a variance report shall be prepared by IA personnel each time a deviation from the requirements of this Specification is detected in areas such as system functions, design parameters, performance, documentation, test plans, and test procedures. Record of all such variances and their resolution shall be maintained by the QA/QC Manager.

However, at any stage if QA/QC Manager feels that quality of variances calls for suspension of the testing the testing shall be halted till satisfactory resolution of variances, which may involve retesting.

The report shall include a complete description of the variance, including:
(a) Sequential identifying number assigned to the variance;
(b) Date and time the variance was detected;
(c) Appropriate references to the test procedures and this Specification;
(d) Description of test conditions at the time the variance was detected;
(e) Estimated date and time when variance is expected to be fixed;
(f) Description of the corrective actions taken (to be completed as part of the variance resolution process;
(g) Dated signature lines for the QA/QC and WBSEDCL's representatives to signify reporting and correction of the variance.

Each variance shall be assigned to one of three classes defining the action to be taken to resolve the variance:

(a) Class 1: Testing will immediately stop and the IA will evaluate and correct the variance before testing is resumed
(b) Class 2: Testing will continue, and the variance will be evaluated and corrected by the IA at the end of the current session but prior to further testing
(c) Class 3: Testing will continue, and the variance will be evaluated and corrected at a mutually agreed upon time.

The class shall be assigned by the QA/QC representative with approval from WBSEDCL authority.

The IA shall maintain and periodically distribute a variance summary that lists for each variance- the report number, a brief description of the variance, its class, and its current status (open or resolved).

SW.28.1.5. The following conditions must be satisfied before starting any test:
(a) All test plans and procedures for the test shall be available.
(b) All hardware and software engineering design change orders shall be incorporated into the system under test. The required form is provided in **ANNEXURE-XXIII**.
(c) All relevant documentation including drawings, lists of deliverables, and software functional and design documents, and user manuals shall be available
(d) A complete regeneration of the software under test shall be performed immediately prior to the start of factory testing;
(e) All operating system parameters, files, and configuration information shall be saved to archive media so that the Smart Metering systems operating environment can be recreated starting with an uninitialized system. The existence and completeness of this data shall be demonstrable;
(f) All database, display, and report definitions shall be saved to archive media so that the databases, displays, and reports can be recreated if necessary;
(g) The image backup of all applications of Systems shall be taken on the archive media so that systems software can be regenerated if necessary;
(h) A complete dry run of each factory test (excluding the integrated system test) shall be conducted by the IA using the test plans and test procedures.

SW.28.2. Type Testing: Type Tests shall be defined as those tests which are to be carried out to prove the design, process of manufacture and general conformity of the product to this specification. Type Testing shall comply with the following:

SW.28.2.1. The IA shall document, within scheduled period as per project plan, copies of test reports and certificates for all the Type Tests that are specified in the specifications and that have previously been performed. These certificates shall apply to items and equipment that are essentially identical to those due to be delivered under the Contract and test procedures and parameter values shall be identical to those specified in this specification. The type tests shall be carried out at NABL accredited labs.

SW.28.2.2. Type test certificates should not be older than 3 years as on Bid Submission Date.

SW.28.2.3. Type Tests shall be performed for all equipment, types for which certification is not provided as required above. If any of the type tests are required to be carried out, the same shall be carried out by the IA.

SW.28.2.4. For pluggable NIC modules, the type tests shall be carried out with the NIC module integrated in the meters being supplied under the project.

SW.28.2.5. In case of failure during any type test, the IA is either required to manufacture a fresh sample lot and repeat all type tests successfully or repeat that particular type tests at least three times successfully on the samples selected from the already manufactured lot at its own expenses. In case a fresh lot is

manufactured for testing then the lot already manufactured shall be rejected.

SW.28.2.6. Documentation for all factory, field, and availability tests that apply to the complete Smart metering system shall be provided in accordance with the requirements defined in this section of specification.

SW.28.3. Quality Assurance and Quality Control Program: The Project Manager of IA should appoint a QA/QC Manager either directly or through its authorised representative, who shall be responsible for all witness testing, approval of test records and in general, management of the QA/QC program of the project. The QA/QC manager shall maintain a Quality Assurance/Quality Control (QA/QC) program that provides that equipment, materials and services under this specification whether manufactured, designed or performed within the IA's plant, in the field, or at any sub-contractor's source shall be controlled at all points necessary to assure conformance to contractual requirements. Instructions and records for quality assurance shall be controlled and maintained at the system levels. The IA shall describe its QA/QC program in the project kick-off and shall submit its QA/QC Manual for review. The QA/QC program shall provide for prevention and ready detection of discrepancies and for timely and positive corrective action. The IA shall document objective evidence of quality conformance. The assigned officer from WBSEDCL shall have the right to carry out Quality Audit and Quality Surveillance of the systems and procedures of the IA's/his vendor's Quality Management and Control Activities. The scope of the duties of the QA/QC Manager, pursuant to the Contract, will include but not be limited to the following:

SW.28.3.1. Review of all the IA's or its sub-contractor's drawings, engineering data etc.

SW.28.3.2. Witness or authorize its representative to witness tests at the manufacturer's works or at site, or at any place where work is performed under the Contract.

SW.28.3.3. Inspect, accept or reject any equipment, material and work under the Contract in accordance with the specifications.

SW.28.3.4. Issue certificate of acceptance.

SW.28.3.5. Review and suggest modification and improvement in completion schedules from time to time; and

SW.28.3.6. Monitor the Quality Assurance program implementation at all stages of the works.

SW.28.4. Software Development Testing: The following testing steps are usually employed in the project lifecycle. The Implementation Agency is expected to follow these steps:

SW.28.4.1. Unit Testing: In unit testing, each piece of code has to be rigorously tested. At this stage testing is done according to the priority of path of code. All the test results are logged in the defect logging tools. After the completion of testing, code is corrected for defect logs. This process is iterative till criteria for successful testing is reached.

SW.28.4.2. Integration Testing - Upon completion of unit testing, integration testing begins. The purpose is to ensure distinct components of the application still work in accordance to customer requirements. Test sets will be developed with the express purpose of exercising the interfaces between the components. This activity is to be carried out by the Test Team. Integration test will be termed complete when actual results and expected results are either in line or differences are explainable/acceptable based on client input.

SW.28.4.3. Incremental Integration Testing - Continuous testing of an application as new functionality is added.

SW.28.4.4. System Testing - System testing is performed when all the components are delivered to central repository prior to the release of the software. The testing is done on priority basis of business processes. All the defects are logged and assigned to respective component owners. The component and unit testing are performed after the correction of code. However, it may depend on size and type of individual test specifications. Impact analysis is useful to narrow done testing efforts by identifying critical test cases affected due to code change.

SW.28.4.5. Pre-Production Testing – Pre-Production testing is done simulating the production load. Test data is either prepared or generated from the tools. This testing is used to evaluate performance, load capacity and concurrency. Load testing tools can also be used for this purpose.

Following special types of testing are done during Pre-Production Testing Phase:

SW.28.4.6. Regression Testing - The objective of regression testing is to ensure software remains intact. A baseline set of data and scripts will be maintained and executed to verify changes introduced during the release have not "undone" any previous code. Expected results from the baseline are compared to results of the software being regression tested. All discrepancies will be highlighted and accounted for, before testing proceeds to the next level.

SW.28.4.7. Performance Testing - Although performance testing is described as a part of system testing, it can be regarded as a distinct level of testing. Performance testing will verify the load, volume, and response times as defined by requirements.

SW.28.4.8. Load Testing - Testing an application under heavy loads, such as the testing of a web site under a range of loads to determine at what point the systems response time degrades or fails.

SW.28.4.9. Installation testing - Testing full, partial, or upgrade install/uninstall processes. The installation test for a release will be conducted with the objective of demonstrating production readiness. This test is conducted after the application has been migrated to the client's site. It will encompass the inventory of configuration items (performed by the application's System Administration) and evaluation of data readiness, as well as dynamic tests focused on basic system functionality. When necessary, a sanity test will be performed following the installation testing.

SW.28.4.10. Security/Penetration Testing- Testing how well the system protects against unauthorized internal or external access, wilful damage, etc. This type of testing may require sophisticated testing techniques.

SW.28.4.11. Recovery/Error Testing - Testing how well a system recovers from crashes, hardware failures, or other catastrophic problems.

SW.28.5. Factory Acceptance Test: The factory tests shall be conducted on all the equipment to be supplied under the project. It is expected that the FAT for equipment supplies shall happen in phases of delivery (FAT test schedule and LOT will be finalized mutually). For this a test cum development system environment shall have to be created for the Smart Metering system, with the HES, integrated MDMS and Database application servers installed in the target data centre. FAT shall include, but not be limited to the following, appropriate to the equipment being tested:

a) Verification of all functional characteristics and requirements specified.

b) Inspection and verification of all construction, wiring, labelling, documentation and completeness of the hardware.

The FAT shall be carried out on the meter integrated with the NIC modules linking to communication module and HES. Communication failover has been agreed between tests shall be carried out to check a seamless failover of communication. All proposed Meters shall be checked with all proposed NIC modules for the communication technology (4G fall back to 3G/2G) selected for the project.

SW.28.5.1. Factory Test Requirements:

(a) The database displays and the report formats developed for the central system by the IA shall be demonstrated and verified at the start of factory testing,

(b) All Field Device, AMI functions, communication & networking systems as well as performance shall be tested and demonstrated,

(c) The IA shall also carry out testing of the standard protocol implementation for successful integration before the FAT starts,

(d) All hardware and software associated with Smart Metering Systems shall be staged and completely tested with simulated data at the IA's facility.

SW.28.5.2. Hardware Integration Test: The hardware integration test shall confirm that the hardware conforms to this Specification and the IA-supplied hardware documentation. The operation of each item shall be verified as an integral part of the system. Applicable hardware diagnostics shall be used to verify that each hardware component is completely operational and assembled into a configuration capable of supporting software integration and factory testing of the system. Equipment expansion capability shall also be verified during the hardware integration test.

SW.28.5.3. Functional Performance Test: The functional performance test shall completely verify all features of the AMI Systems hardware and software. This shall mean the suit of application software shall be made to run on the actual HES infrastructure integrated with the field level hardware components, using selected communication paths. As a minimum, the following items shall be included in the functional performance test:

SW.28.5.3.1 Inspection of all equipment for conformance to drawings/document and satisfactory construction and appearance;

SW.28.5.3.2 Testing of the proper functioning of all software, including test cases with normal and exception user-entered inputs and responses;

SW.28.5.3.3 Simulation of local error and failure conditions;

SW.28.5.3.4 Verification that ultimate expansion requirements are met;

SW.28.5.3.5 Verification of data link interfaces with other Central systems;

SW.28.5.3.6 Verification of Field Device communication interfaces (with failover) and data link interfaces with other central systems. This shall include the tests of proposed makes of meters with proposed types of NIC modules;

SW.28.5.3.7 Simulation of Field Device and data link communication errors and channel failures, including incorrect check codes and random channel noise bursts;

SW.28.5.3.8 Test of MDMS integration with major functionalities;

SW.28.5.3.9 Testing of all user interface functions, including random tests to verify correct database linkages;

SW.28.5.3.10 Simulation of hardware failures and input power failures to verify the reaction of the system to server and device failure;

SW.28.5.3.11 Demonstration of all features of the database, display, and report generators and all other software maintenance features;

SW.28.5.3.12 Demonstration of the software utilities, libraries, and development tools;

SW.28.5.3.13 Verification that the computer system meets or exceeds performance requirements;

SW.28.5.3.14 Verification of the accuracy of hardware and software documentation via random tests;

SW.28.5.3.15 Sample check of meter calibration accuracy and testing of spare parts;

SW.28.5.4. Integrated System Test: The integrated system test shall verify the stability of the system hardware and software after the functional performance test has been successfully completed. During the integrated system test, all functions shall run concurrently and all IA-supplied equipment shall operate for a continuous 100-hour period. This minimum level of activity may be augmented, by other activities that represent normal day-to-day operation of the system as long as these activities are conducted in accordance with the documentation provided with the system. These other activities may include, but shall not be limited to, database, display, and report modifications, software development activities, configuration changes (including user-commanded server and device failovers), and the execution of any function described in this Specification.

The integrated system test shall ensure that the computer system is free of improper interactions between software and hardware while the system is operating as an integrated unit. In case during the 100-hour period testing, un-commanded functional restart or server or device fail occurs the test shall be extended by 24 hours each time such a fail over occurs. Further the test shall not be conducted with the failed device.

SW.28.5.5. FAT Inspection: All FAT will be carried out by joint inspection of WBSEDCL's representative and QA/QC manager from IA. Deliverables shall not be shipped until all required inspections and tests have been completed, all deficiencies have been corrected, and the equipment has been approved for shipment by WBSEDCL authority.

The vendor will have to offer the materials in writing for material inspection. The vendor shall intimate at least 7 days in advance through notice(s) about the readiness of material for dispatch commensurate with specific delivery schedule so as to enable WBSEDCL to depute his representative for inspection testing and checking of the material/equipment **(Expenses will be borne by WBSEDCL)**. For this purpose, the date of receipt of the

letter in the office of the purchasing authority shall be deemed as the date of call for inspection and not the date mentioned in the letter and the date of dispatch. The designated officer/ representative of WBSEDCL shall on giving seven days, notice in writing to the contractor setting out any grounds of objections which he may have in respect of the work, be at liberty to reject any drawing and all or any plant, or workmanship connected with such work which in his opinion are not in accordance with the contract or are in his opinion defective for any reason whatsoever.

If any inspections or tests indicate that specific hardware, software or documentation does not meet the Specification requirements; the appropriate items shall be replaced, upgraded, or added by the vendor as necessary to correct the noted deficiencies. After correction of a deficiency, all necessary retests shall be performed to verify the effectiveness of the corrective action.

WBSEDCL reserves the right of having any inspection of special test of a reasonable nature at contracts premises or at sites in addition to those prescribed in applicable standards and the enclosed technical specification. In case of inspection for more than two times for the same offered lot due to vendor's default, a penalty amount of **Rs. 25,000 /- (excluding GST)** against each inspection will be payable by the bidder to the account of WBSEDCL. Unless the inspection is specifically waived no material shall be dispatched without inspection and clearance for dispatch by the purchase's representative. WBSEDCL reserves the right to reject all or any part of the material being manufactured of awaiting dispatch, due to any defect or deviations from the standard specifications prescribed as observed during the Inspection.

In case of any dispute/difference in this regard the decision of the Chief Engineer, IT&C Cell shall be final and binding. WBSEDCL also reserves the right to get the material/equipment tested in any recognized Government Laboratory & claiming any compensation or rejecting the material/equipment, if not found in accordance with the specification. All charges consequent to such rejection and replacement/rectification shall be borne by the supplier.

The test shall be considered complete when

(a) When all variances have been resolved;
(b) All the test records have been filed;
(c) Assigned officer from WBSEDCL acknowledges in writing the successful completion of the test.

SW.28.5.6. Dispatch: The Dispatch Instruction (DI) for all smart meters and its accessories shall be issued by WBSEDCL only after successful completion of FAT as per specification. The DI for the meters shall be issued in phases as per the installation plan mentioned in **Clause IB.22.**

SW.28.5.6.1. Material shall be dispatched after the specific DI to the Central Testing Center of WBSEDCL. Following documents shall be sent along with material (in soft copy/hard copy):

a. Govt. certified/accredited lab testing certificate

b. Test reports
c. MDCC issued by WBSEDCL
d. Invoice in duplicate
e. Packing list
f. Drawings & catalogue
g. Guarantee / Warranty card
h. Delivery Challan
i. Other Documents (as applicable)

SW.28.5.6.2. The delivered meters shall be sample tested at the Central Testing Center of WBSEDCL and Store Receipt Voucher (SRV) shall be issued by WBSEDCL only after successful sample testing.

SW.28.5.6.3. Then these meters shall be distributed to the Zonal testing Centres of WBSEDCL as per requirement.

SW.28.5.7. Testing at WBSEDCL testing centre(s):

a. 100% testing of each smart meter of the delivered lot shall be carried out at the testing centres of WBSEDCL and if tested ok, these meters shall also be sealed.

b. For installation, the successfully tested meters shall be taken from the stores from the respective zones and shall be taken at the site jointly by WBSEDCL and the IA, where the commissioning part including establishment of successful data communication from the meter to HES and vice-versa is to be completed by the IA as mentioned in clause **SW.16.1.1**.

SW.28.6. Field Installation and Integration Test (FIIT): Before the start of the FIIT, the following steps have to be completed:

SW.28.6.1. All field level hardware which have undergone FAT shall be installed at the site and the installation report signed off;

SW.28.6.2. Before the delivery of the first lot of field devices (Meter with NIC), the production hardware (servers, WS, LAN/Routers, FW, etc.) and software (HES integrated with MDMS) shall be provisioned at the WBSEDCL data centre.

SW.28.6.3. integration of HES to existing MDMS should be completed;

SW.28.6.4. The installed field hardware shall be configured and registered in the production environment of WBSEDCL data centre;

In the FIIT tests regime, the minimum following tests shall be performed:

a) Proper registration of the incoming population of field devices;
b) Checking of user interface linkages with database;
c) Remote configuration downloads and reading of profiles;
d) If required checking of new meter readings with existing meter readings;
e) Forced event creation and communication of such events;

f) Performance tests of device communication links;
g) Device communication link failover;
h) Integration tests with the MDMS in line with a use case table to be drawn up by the IA.

SW.28.7. Site Acceptance Test (SAT): SAT shall be carried out with Smart Meters in lots as these are delivered and passes through the Field Installation and Integration tests. The first lot to be subjected to SAT shall consist of the complete WBSEDCL data centre and its hardware and software components along with supply, installation & integration of minimum of 500 meters from 1st Lot Smart Meters & NIC. The SAT for remaining meter population shall be staged based on the total supply (LOT wise), installation and integration of Smart Meters (along with its related hardware and software equipment).

The SAT shall exhibit generally all functions of the equipment. The list of final tests to be carried out in the field shall be listed in the site-testing document by the IA. Among others, the site testing document shall include the following minimum performance tests:

Sl. No.	Data Type	Parameter	Performance Requirement
1	Load Profile Data Read	One-month block load profile for installed meters	From 95% of the meters in 12 hours after the midnight
2	Billing Profile Data Read	Billing profile data for installed meters	From 95% of the meters in 24 hours after the midnight
3	Daily Profile Data (Midnight Data in TOD form) Read	7 days block load profile for installed meters	From 95% of the meters in 12 hours after the midnight
4	Instantaneous Data Read	Current Instantaneous data	From 95% of the meters in 8 hours of scheduled action time
5	On-Demand Remote reads of meters	Collection of 7 days of interval energy or similar	From 90% of the meters in 30 minutes
6	Ping Response with acknowledgement/ response for selected meters	For installed meters	Action performed at 99% of meters within 2 hours
		For an individual meter	Action performed within 180 seconds
7	Integration with MDMS	Processing MDMS request	99.9% request should be processed within 30 sec
8	Meter loss and restoration of supply	Receiving of alert for all affected AMI meters	Alert to be received within 30 minutes for 60% of meters

9	Meter Tamper Alerts	Receiving of alert for an individual meter	Alert to be received within 30 minutes
10	Power Quality Alerts	Receiving of alert for an individual meter	Alert to be received within 30 minutes
11	Firmware upgrade with acknowledgement/ response for selected meters	For installed AMI meters	Action performed at 99% of meters within 12 hours
12	Remotely altering settings in meter	For installed AMI meters	Action performed at 99% of meters within 6 hours
13	Remotely read events logs	For reading the full event log for installed AMI meter	Action performed at 95% of meters within 6 hours
14	Utility User Interface	Manual data entry of new value appears on screen	Less than 60 secs
		Acknowledgement of any action request	Within 60 secs
		Display update rate	30 secs

Interim inspection reports shall be generated if the SAT is unsuccessful at any stage and all variances shall have to be corrected and recorded. On successful completion of each lot of SAT, meters will be eligible for issuance of relevant commissioning certificate.

SW.29.Operational Go Live & Final Acceptance: The Operational GO-LIVE of the Smart Metering System shall be considered as completion of the SAT (**SW. 28.7**) for each lot (along with its related hardware and software equipment) supplied installed and integrated. IA's obligations for Operational Go Live of the system shall be deemed to be met when the following milestones are achieved:

(a) Supply and integration of the Smart Meters (along with its related hardware and software equipment)
(b) Successful completion of SAT for each lot of Smart Meters;
(c) Successfully integration of MDMS with HES, Utility Portal with dashboard & Reporting;
(d) Successful completion of the integration of MDMS with Legacy systems;
(e) Meter installation mobile app with full functionalities;
(f) Successful completion of system availability test;
(g) Successful completion of the following minimum AMI system use-cases:

Sl. No.	Use Case	Activity	Source	Destination	Info Exchanged with visibility on dashboard

1	Read Demand & Energy Data Automatically from Consumer meters.	Requesting instantaneous, interval & events data from meters	Meter	HES	Meter no, reading date & time, reading params (KWh, KVAh, KW etc.)
		Acquire instantaneous, interval / events data from meters by HES which then reaches MDM system.	Meter	HES->MDMS	Meter no, reading date & time, reading params (KWh, KVAh, KW etc.)
		At scheduled freq. HES sends data to MDMS. Provision for retrial should be there if Meter data is not collected within time. Consumption details will be 15 min block data, and data could be incremental to what was sent by meter in preceding instance	HES	MDMS	Meter no, reading date & time, KW, KVA, KWH, KVAH, PF
2	Utility detects tampering or theft at site	Tamper events captured by meter sent to HES.	Meter	HES	Meter no, tamper Code / description, tamper occurrence date & time
		High priority events reach MDMS for further action.	HES	MDMS	Meter Number, event date & time, event Code /description
		Tamper event shared with CIS/CRM. Billing determinants are	MDMS	CRM	Meter Number, event date & time, event Code /description

		updated for tamper invoicing			
		Notify utility personnel for site inspection	MDMS	Email/SMS gateway	Consumer number, Meter Number, Tamper code, Address, Lat long
3	Missed interval readings	On identifying missed interval, HES will re acquire data for the missing period from meter	HES	Meter	Meter no., from date & time, to date & time (for which data is missing)
		On receiving data request command, meter will send data to HES	Meter	HES	Meter no., from date & time, to date & time (for which data is missing)
		Missed Interval and Reads Data acquired by MDMS	HES	MDMS	Meter Number, readings with date & time
4	Connection has an outage	Power Outage Notification (PON)	HES	MDMS	Meter no, Outage Date & Time, Power On-Off count
5	Connection restore from outage	Power Restoration Notification (PRN)	HES	MDMS	Meter no, Restoration Date & Time, Power On-Off count
6	Remote firmware upgrades/ meter configuration changes	Configuration Commands: Change tariff parameters, synchronize clock, Registers reset (status, maximum, tampering)	MDMS	HES→METER	Meter number, tariff parameters, registers status, event type and priority
		Status update of Firmware / Configuration	METER→HES	MDMS	Flag value
7	Load monitoring at demand side	When there is a load violation event recorded in	METER	HES->MDMS	Meter no, max demand, date &

		the meter, the information is sent to the control centre			time of load violation
8	New Consumer Connection	Requesting instant, interval & events data from meters	MDMS	HES→METER	Meter Number, reading date & time, reading params (kWh, kVAh, kW etc.)
		Acquire instant, interval /events data from meter by HES which then reaches MDM system.	HES	MDMS	Meter Number, reading date & time, reading params (kWh, kVAh, kW etc.)
		Once new meter remote read verification is over, confirm new connection with other applications	MDMS	Billing/SAP-ISU	Consumer ID, Consumer address, Meter Number, initial reading etc.
8	Demand read of meters from consumer premises	Requesting instantaneous, interval, load profile & events data from meters	MDMS	HES→METER	Meter Number, reading date & time, reading params (kWh, kVAh, kW etc.)
		Acquire instant, interval, load profile & events data from meters by HES which then reaches MDM system	METER->HES	MDMS	Meter Number, reading date & time, reading params (kWh, kVAh, kW etc.)
9	Time synchronization	Sync up of meters master data and Network Hierarchy in case of installation of new meters	HES	MDMS	Network identification information.
10	Metering network changes	Change in Meter Network Hierarchy	HES	MDMS	Network identification information.
11	Mobile App as CMRI	Installation & Commissioning of meter	Mobile App	HES	Meter Number, all meter data etc.

12	Survey/installation mobile app	Manual Meter Reading	Mobile App	HES	Meter Nameplate, First Breath, Meter Number, reading date & time, reading params (kWh, kVAh, kW etc.)
13	Monthly Billing Profile Collection	Command from Billing system triggered and send to MDM / HES for collection of Monthly billing Data	SAP-ISU	MDMS	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
		At scheduled frequency HES should pull the monthly meter data from Smart Meter over the communication channel	HES	Meter	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
		Meter should send the data to HES. Provision for retrial should be there if Meter data is not collected within time.	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
		HES should decrypt and validate the data collected and send to MDM	HES	MDMS	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
		MDMS should send the required parameter to Billing system for Monthly Bill calculation	MDMS	SAP-ISU	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date

14	Consumer Registration in Consumer Portal/ App	Consumer clicks on new user on consumer portal/ App, provides RMN or email ID and submits data	Portal/ App	CRM	Request for registration with RMN/email ID
		Utility receives request for registration and sends OTP after verification	CRM	Email/Message Gateway	OTP
		Consumer submits OTP	Portal/ App	CRM	
		Consumer receives registration detail	CRM	Email gateway	Login ID and default password
		Consumer submits first login request	Portal/ App	CRM	
		System seeks password change	CRM	Portal/App	
		Consumer changes default password	Portal/ App	CRM	
15	Consumer Access to Consumption, Billing & Profile Data	Consumer logs in to Portal/ App	Portal/ App	MDMS	
		Consumer Profile for Portal/ App	CRM	MDMS → Portal/ App	Name, Account, Address, Service Points
		Consumption Data	MDMS	Portal/ App →UI	Consumption profile
		Billing	Billing → MDM	Portal/ App	Post-paid Billing history/ Current Bill, Bill view through hyperlink to existing WBSEDCL portal
16	Consumer Service Request	Consumer logs in to Portal/ App	Portal/ App	CRM	
		Consumer requests for service	UI	CRM	Service Request
		System assigns SRN & sends acknowledgement	CRM	Portal/ App→ UI, Email/SMS Gateway	

		System resolves request & updates consumer records	CRM	Portal/ App→ UI, CRM	
		System closes SRN	CRM	Email/SMS Gateway	
17	Consumer Complaints	Consumer logs into Portal/ App	Portal/ App	CRM	
		Consumer registers complaint	UI	CRM	Specific complaint
		System assigns CRN & sends acknowledgement	CRM	Portal/ App→ UI, Email/SMS Gateway	
		System assigns resolution based on nature of complaint	CRM	CIS / OMS / WFM	
		Target system reports completion of complaint	OMS/WFM	CRM	
		System updates records and closes CRN	CRM	CIS, Email/SMS Gateway	
18	Staff User Access to Utility Portal	User logs in to Portal	Portal	MDMS	Login with appropriate credentials
		User selects available functions	MDMS	Portal → UI	
		User logs out	Portal → UI	MDMS	

The IA shall specify and deliver an initial system that supports the collection and storage of data for meeting the performance level for 130% of the quantity of Smart Meters under scope with facility of future expansion.
The MDMS shall have the ability to selectively choose which data to be maintained and which to be purged or archived as per requirement of Utility (user selectable).
The Consumer Portal should be designed in a mobile responsive mode.

SW.29.1. The bidder has to test and demonstrate the operational performance of the entire system after completion of entire scope. Bidder should note that WBSEDCL can appoint a third-party agency for conducting any part of above testing procedures (in addition to the testing carried out by the bidder).

SW.30.Training and Handholding: General requirement for training to be imparted is as follows:

a) Training shall be conducted by IA/OEM's personnel who are experienced instructors and speak understandable English/Hindi/Bengali.
b) The bidder shall provide training to various user groups nominated by WBSEDCL. The bidder shall provide the Training Approach in the response.
c) All necessary training material shall be provided by the Bidder. Each trainee shall receive individual copies of documents used for training. Training material shall be organized by functional process that will serve as the training documentation for a particular functional area.
d) Training materials, including the documents provided to the trainees as well as handouts, shall become the property of utility. utility reserves the right to copy such materials, but for in-house use only.
e) The schedule, location, detailed contents, for each course shall be finalized during detail engineering. The number of participants in the training program may undergo change.
f) The training will consist of a curriculum of courses to address the issues of system operation, business-wide application, changed business processes and general use of the new system.
g) The recommended training material can be in paper / electronic media with courses on used software fundamentals, business process overview, job activity training, and delivery options being on-line, CBTs, instructor led class rooms, etc.
h) Representatives from the IA, utility's project management teams will be involved throughout in the development of training strategy, training material design and development, standards and training delivery to ensure that change management issues are incorporated, and that training strategies and materials are aligned to the requirements of the project and as business-specific as possible.

The training modules shall include but not limited to:

- System Administration & Configuration
- Software and application Installation and Trouble-Shooting
- Administrative access, trouble-shooting etc.
- Integration Management
- Application Management
- Smart meter installation
- NIC installation and configuration
- HES reporting etc.

The bidder shall be required to organize following training for the utility personnel:

Professional Training- This is the training for the core group (Implementation Team) of the utility. This team will comprise of members from all the Business Functions, Metering and IT of WBSEDCL. Each member would be trained in the relevant function / module. This Training would be required to be given to approximately 15-20 personnel (around 2-3 groups) of WBSEDCL. It is the responsibility of bidder to deliver this training. Standard curriculum designed and agreed by the owner for hardware, software and network preferably from the OEM partner or OEM's certified training partner shall be arranged for each group. Part of these trainings shall be conducted on-site.

End User Training - The bidder will provide training to WBSEDCL's team (Trainer's Team) on a "Train the Trainer" basis. The Owner's team so trained will then train all of the WBSEDCL's

employees. It is estimated that this training by selected bidder will require around 5 groups (zone wise including HQ), with each group comprising of around 10 to 15 persons. These training sessions will be required to be conducted at different zonal offices of WBSEDCL.

SW.31.Required Certificates:

Installation Certificate: After Successful installation of Smart Meter in circuit with all necessary accessories, installation certificate as per **ANNEXURE-XVIII** should be submitted for bill claim. Installation certificate is also required for re-installation or replacement of meter also.

Commissioning Certificate: Vendor can apply for Commissioning certificate for any installed smart meter only after entire system acceptance and declaration of successful system Go-Live i.e. installation & commissioning (with successful trial-run) of all equipments (meter, NIC card, communication module) with creating the application with initial database and user management (HES system) and integration with existing MDMS system.

The concerned Supervising Officer for all site offices shall sign **"Commissioning Certificate"** for:
Successful commissioning of Smart Meter with all necessary accessories at Consumer Premises and Handover of all user id and password to their respective user assigned for that site tested by successful login.
Satisfactory hands-on live training on how to use and operate the system.
The format for Commissioning Certificate is available in **ANNEXURE-XX.**

Performance Certificate: The vendor shall prepare performance certificate as per **ANNEXURE-XX** for monthly billing invoice. Performance parameters are only be considered from system generated reports only. A Consolidated performance report considering other SLA parameters (from SLA tool report) need to be prepared to justify monthly invoice.

SW.32. Technical Specification [TS]

The main objective of AMI is to establish / enable two-way communication between smart energy meter and Head End System (HES) to enable remote reading, monitoring & control of electrical energy meters and electrical network meters to serve as repository of record for all raw, validated and edited data. The sanitized data may be subscribed by other utility function for higher order analysis and billing and collection engine etc. The Advanced Metering Infrastructure helps utility to manage their resource and business process efficiently.

The required Sub-system of AMI (Smart meter to HES) system shall support at-least but not limit the following functionalities:
a) Remote Meter data reading (Scheduled / Instantaneous) at configurable intervals (push/pull);
b) Time of Use (TOU)/ TOD metering;
c) Support Net Metering for adding renewal energy sources to circuit efficiently;
d) Alarm/Event detection, notification and reporting;

e) Network Monitoring System for the field area network (NAN/WAN), Remote firmware upgrade, configuration of network nodes and system time synchronisation across all devices to ensure accuracy of time stamping;
f) Integration with proposed MDMS;
g) Security features to prevent unauthorized access to the HES including Smart Meter & meter data etc.;
h) The System should accurately maintain system time synchronization across all devices to ensure accuracy of data;
i) System shall adhere with the appropriate security algorithm for encryption and decryption as for data exchange between filed devices and HES per IS16444 and follow cyber security guidelines for data security;
j) MDMS functionalities.
IA may design appropriate architecture for providing metering solution. IA is free to decide upon the best solution out of all the available options. However, the entire responsibility of fully functional system shall rest with the IA in order to meet the performance levels as given in this document.

Following core components of AMI shall be provided:
1. 3-Phase whole current Smart Meter with import-export mode. (as per **clause SW.1.4.**)
2. 3-Phase CT-operated Smart Meter (LT/CT, 11 kV, 33 kV and 132 kV)
3. NIC card and Communication Infrastructure with two physical SIMs or one e-SIM of two different ISPs.
4. HES
5. MDMS
6. Meter installation Mobile App (Android Based)
7. Meter data download Mobile App (Android based)
8. Base Computing Software (BCS) (Windows based)
9. Consumer mobile App and portal
10. Consumer portal
11. WBSEDCL User portal

The Technical Specifications of the components of the AMI system are detailed in **ANNEXURE-IX**.

General Conditions of Contract [GCC]

GCC.1. General Terms:

GCC.1.1. The entire work shall be executed on TOTEX MODEL. After successful completion of the project i.e. 10 years from the placement of LOA, the whole system including Consumer smart meter, communication system, HES, and customized software shall be handed over to WBSEDCL without any cost. The vendor also shall hand over all the operations, relevant documents i.e. design documents, source code, integration details, component's specifications and circuit diagrams etc to WBSEDCL as per exit management plan.

GCC.1.2. Consumer Smart Meters to be supplied, and WBSEDCL shall have all rights to inspect, seize, test at own and any other third-party laboratory at any time. For any adverse or irregularity or malpractice i.r.o smart meters or service connections, WBSEDCL have all the rights to lodge a F.I.R. or to take necessary legal action as per WBERC regulations.

GCC.1.3. The quantities of job mentioned are indicative in nature and may vary -10% to +10% (during 10 years of the project) as per business requirement. There is no firm commitment from WBSEDCL and it reserves its right to reduce or increase the quantities indicated during the contract period time to time. The successful tenderer shall not be permitted to revise the rates quoted for such increase or decrease in the quantity. WBSEDCL shall not be liable to pay damages/compensation for such increase/decrease. WBSEDCL reserves the right to increase/decrease the work order quantity at the time of confirmation of order.

GCC.1.4. The components of all the equipments delivered must be of latest technology.

GCC.1.5. After successful commissioning of the smart meters, the vendor shall never be allowed to dismantle and de-install the device from any premises without prior permission from WBSEDCL. Otherwise penal action will be taken against vendor including forfeit of security deposit, termination of contract. The vendor shall be responsible for time to time up gradation of hardware and software to maintain the full functionality of system without any extra cost. During entire contract period, the vendor has to deliver and install on site updates, patches etc. of the Software if any, free of cost.

GCC.1.6. The bidder has to furnish all the information as required regarding their offer.

GCC.1.7. WBSEDCL reserves the right to reject the hardware/software, even after delivery, if any deviation from tendered specifications is found in the supplied materials at any point of time.

GCC.1.8. Bidders shall also submit proposals of work methods and schedule, in sufficient detail to demonstrate the adequacy of the bidders' proposal to meet the technical specifications and the completion time.

GCC.1.9. For non-timely completion of the project, WBSEDCL reserves the right to divide/split/modify/cancel the entire job during placement of order without showing any reason whatsoever.

GCC.1.10. The bidder shall have the sole responsibility of complete system integration and ensure that all required arrangement/procurement should be confirmed from his own or respective service providers. However, WBSEDCL have no responsibility at any point of time to contract, interact or pay directly to these entities.

GCC.1.11. The bidder shall satisfy WBSEDCL with his ability to complete the works positively within the stipulated time. WBSEDCL reserves the right to review the bidder's capability and capacity to perform the work before awarding the Contract.

GCC.1.12. The Company reserves the right, to reject any or all the tenders, at its discretion, without assigning any reason whatsoever.

GCC.2. Steps to be taken to avoid any damages of WBSEDCL installation: IA shall see that no damages are caused to Electrical Cables, wires, station installations, communication lines, electric devices. If any damage is caused to or suffer or and in general to WBSEDCL Equipments or any property or by the consequences of the acts of unlawful omission of the contractor, its employees and workmen or other person connected with it, necessary repairs of replacements shall be effected by WBSEDCL at the risk and cost of the contractor. The expenses shall be recovered from the money due and payable to the contractor or by other appropriate processes.

GCC.3. Intellectual Property: Each Party represents warrants and agrees to the other Party that it shall:

GCC.3.1.1. Not use nor represent (in any manner whatsoever) the other Party's Intellectual Property as their own;

GCC.3.1.2. Treat the other Party's Intellectual Property as Proprietary Information, and use and disclose it only as set forth herein; and

GCC.3.1.3. Not do anything which, in the opinion of either Party, may bring the interests of such Party or any of its Affiliates into disrepute or damage the interests of such Party or any of its Affiliates in any way; and

GCC.3.1.4. Formulate ways in which a record is maintained giving details of a Party's Intellectual Property made available to the other party.

GCC.4. Confidentiality: All data generated during the operation period shall be the property of WBSEDCL. Any data received from WBSEDCL initially or during the contract period or data generated during the period, in no way will be shared with any third party except written prior permission from WBSEDCL. Otherwise strict legal action as per law may be taken by WBSEDCL against the vendor including other third parties who will acquire the data in unauthorized way.

GCC.5. Disclosure: In the event that any occurrence or circumstance comes to the attention of either Party that renders any of its aforesaid representations or warranties untrue or incorrect, such Party shall immediately notify the other Party of the same.

GCC.6. CONTRACT AGREEMENT: The contractor / Vendor (successful bidder) shall have to be entered into a Contract Agreement 30 (thirty) days from the issue of the Letter of Award (LOA) with West Bengal State Electricity Distribution Company Limited (WBSEDCL) for the proper fulfilment of the contract as per Pro forma **(ANNEXURE-XV)**. All Documents/ Correspondences relevant to this tender evolved during the tendering process and firming up of the Contract and during execution of the work will form part of the agreement. The successful bidder shall have to submit a copy of the whole tender document duly signed and stamped by the authorized representative of the successful bidder.

GCC.7. Contract Period: The overall contract period shall be earlier of (a) 10 (ten) years from the date of issuance of LoA or (b) As soon as the "Meter-Months" exceeds "Total Meter- months".

GCC.8. Contract Value:

a. The value of the project for a particular type of meter will be according to (Lumpsum charges per meter for the particular meter type + {value of charges per reading data per month for that meter type x 84)} x total no. of those particular meters excluding taxes and duties
b. Thus, the Total contract price of the entire project shall be the **SUM TOTAL** of the value (as derived from **a** above) for all the 4 types of meters.

GCC.9. Performance Guarantee:

GCC.9.1.1. As contract security, the vendor has to furnish a performance Guarantee in the form of Bank Guarantee on non-judicial stamp paper of Rs.100/- by any Schedule Bank in India, as per format enclosed **ANNEXURE-XVI**. The PBG shall be submitted to the CE, IT&C Cell, 3rd Floor, 'D' Block, Vidyut Bhawan, WBSEDCL. For any failure towards satisfactory performance on the part of the Bidder(s), the Bank Guarantee will be liable to encashment and forfeiture.

GCC.9.1.2. As Performance BG, 10% of Contract Value to be submitted within 45 days from the date of issue of LOA. Validity of PBG will be 5 years from the date of LOA and claim period will be further 6 months. The validity of that PBG shall have to be extended subsequently in such a way so that it covers the entire project duration of 10 years.

GCC.9.1.3. Additional security of 10% of the quoted price may be submitted by the bidder, in case the offer rate is abnormally lower than the estimated cost, as per the proforma enclosed (**ANNEXURE-XXII**).

GCC.9.1.4. Performance Guarantee furnished in any other form will not be accepted.

GCC.9.1.5. Performance Guarantee will not carry any interest.

GCC.9.1.6. In case the contract is renewed, the successful bidder has to extend the validity of the Performance Bank Guarantee for a further period of ninety (90) days after the renewed contract Period.

GCC.9.1.7. The Performance Guarantee shall cover the entire contract period for satisfactory performance. For any failure towards satisfactory performance on the part of the Bidder(s), the Bank Guarantee will be liable to encashment and forfeiture. The

proceeds of the Performance Guarantee shall be payable to WBSEDCL as compensation for any loss resulting from the failure on the successful bidder's part to complete its obligations under both the Contracts or if any Liquidated Damage is levied on the Bidder(s) as per terms of any of the two Contracts.

GCC.10. Liability for Accident: If any accident occurred during the time of the execution of the work by your employee, all cost to be borne by bidder itself.

GCC.11. INDEMNITY BOND: The contractor / Vendor (successful bidder) shall have to produce Indemnity Bond as per Pro forma (**ANNEXURE-XVII**) within 30 (thirty) days from the issue of LOA to the Controlling Officer of the work.

GCC.12. Completion Time:

GCC.12.1. Completion time for execution of the project in turn-key basis shall be as mentioned in the time-schedule at clause **IB.22** from the date of issuance of LOA. The vendor shall complete the entire job including installation, commissioning, integration, initial database creation, user training, test run and shall hand over the system for use within scheduled completion time as stipulated in this clause.

GCC.12.2. If due to any unavoidable circumstances the bidder is unable to commission Smart Meter SYSTEM and devices for some locations and if this number is less than 5% of initial ordered quantity then the vendor may apply to ordering authority for issuance of completion certificate. The reason for non-commissioning of 5% must be submitted with necessary supporting document. The acceptance of such reason shall be under the sole discretion of WBSEDCL.

GCC.12.3. The contract shall be considered completed on end of the contract period after full handing over of data, documents or material and clearing all dues towards the vendor as specified in this document. On successful completion of the entire project the controlling officer would issue the Completion Certificate for the entire scope of installation and commissioning under the LoA.

GCC.13. Risk Purchase / Performance: Adherence to time schedules mentioned in the foregoing clauses shall be deemed as the essence of contract and if the vendor fails to deliver within the periods prescribed for such work in the contract, WBSEDCL shall be entitled to execute the job through the best substitute available elsewhere on the account and at the risk of the contracting vendor or to cancel the contract and the contracting vendor shall be liable to compensate for any loss or damage which WBSEDCL may sustain by reason of such failure on the part of the Contracting Vendor.

GCC.14. Warranty:

GCC.14.1. The IA warrants that all the Goods that would be used as part of Solution would be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

GCC.14.2. The IA further warrants that the Goods shall be free from defects arising from any act or omission of the IA or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.

GCC.14.3. The warranty of the complete system shall remain valid till expiry of the Contract Period.

GCC.14.4. The IA shall be responsible for comprehensive maintenance of all the equipment and systems supplied & installed under this Contract during the Operational Period. There may be some variation during detailed engineering. IA will have to make their own assessment of the systems and deploy manpower accordingly. However, it is to be ensured that specified manpower of requisite qualification is deployed.

GCC.14.5. The maintenance of the system supplied & installed by the IA shall be comprehensive. The IA shall be responsible for providing all the spares as mentioned in scope of work of this Contract. The spares shall be maintained by the IA at no extra cost to Utility.

GCC.15. Force Majeure: "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Vendor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:

GCC.15.1. war, hostilities or warlike operations (whether war be declared or not), invasion, act of foreign enemy and civil war,

GCC.15.2. rebellion, revolution, insurrection, mutiny, usurpation of government, conspiracy, riot and civil commotion,

GCC.15.3. earthquake, landslide, volcanic activity, flood or cyclone, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster,

Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligation is prevented by any circumstances of Force majeure, which arises after date of Notification of Award.

If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed.

Though the Vendor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract, in case of such event the Vendor shall submit to WBSEDCL a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Vendor shall agree upon the period of such extension.

GCC.16. Exit Management Plan (EMP): In case the Contract with the Utility ends or is terminated before the expiry date of Contracts, the Parties shall agree at that time whether, and if so during what

period, the provisions of this Exit Management Plan shall apply. The Parties shall ensure that their respective associated entities carry out their respective obligations set out in this Exit Management Plan. The exit management shall be done in such a manner that operations should continue without any restriction on access/usage of any kind of functionality. At the end of the Contract period, Implementation Agency shall provide necessary handholding and transition support to the Utility or its agency for maintaining the system post the Contract with the vendor. This includes (but not limited to):

GCC.16.1. Conducting detailed walkthrough and demonstrations for the System Solution;

GCC.16.2. Addressing the queries/clarifications of the designated staff / new agency with respect to the working / performance levels of the infrastructure.

GCC.16.3. Any pending business Process Guides; Program Flow Descriptions; Integration Sequence; Interfacing Details; Troubleshooting Guides etc.

GCC.16.4. Frequently Asked Question (FAQ) Guides.

GCC.16.5. Conducting training sessions.

GCC.16.6. Complete system handover.

GCC.16.7. Knowledge Transfer.

GCC.16.8. Any other activity, over and above these, as may be deemed necessary to meet the service levels and requirements specified in the bid document.

Vendor will facilitate / allow the Utility or its nominated agency access to information reasonably required to define the current mode of operation associated with the provision of the services to enable the Utility to assess the existing services being delivered.

The vendor shall prepare an Exit Management Plan for transfer of operations to the Utility or its nominated agency, in the event of termination or expiry of the contract with the Utility, without affecting services to stakeholders adversely. Vendor shall get this process approved by Utility. The Plan shall include, but not be limited to, the following:

- A detailed program of the transfer process including details of the means to be used to ensure continuing provision of the Services throughout the transfer process or until the cessation of the Services and of the management structure to be used during the transfer.
- Plans for provision of contingent support to Utility or its nominated Agency for a reasonable period after transfer.
- The Exit Management Plan including all updates shall be presented by the IA to and approved by the Utility or its nominated agencies.
- During the Exit Management Period, the IA shall use its best efforts to deliver the services.

In case WBSEDCL observes the lack of willingness to manage transit/ sharing of information or lack of support from IA end, WBSEDCL shall have absolute discretion to levy severe penalties and deduct the amount from performance bank guarantee.

GCC.17. Exit clause after end of contract: Till the end of contract IA should complete all system handover process to utility or it's nominated agency with all access, documents, handholding trainings etc. and Exit Management plan will be followed as per clause **GCC.16**. Also, The IA shall not delete any data from HES beyond the expiry of the Agreement without the written approval from WBSEDCL.

GCC.18. Cancellation/Termination of Order: WBSEDCL shall have every right to repudiate the contract if the work is not completed within schedule completion time as per "Time Schedule" and "Completion Time" Clause. WBSEDCL will be at its discretion to take possession of the smart meters installed at consumer premises along with all other equipments and shall have the right to invoke and appropriate the entire amount of PBG without citing any cause thereof. The following causes may also lead to cancellation of LOA:

GCC.18.1. Non-acceptance of LOA as per "Acceptance" clause.
GCC.18.2. Non-submission of Performance BG within time.
GCC.18.3. If the vendor is found to have Conflict of Interest.

GCC.19. Further Grounds/ Modes of Termination:

GCC.19.1. IMPLEMENTATION AGENCY (IA) EVENT OF DEFAULT

GCC.19.1.1. IA Event of Default means any of the following events arising out of any acts or omission of IA, its representative, sub-contracts, employees and which have not occurred solely as a result of any breach of this Contract by the Utility or due to Force Majeure, and where IA has failed to remedy these events within a period of 90 (ninety) days of issuance of a notice by Utility requiring IA to remedy such event.

a) IA has failed to procure and arrange requisite finances for the implementation of the Project;
b) IA abandons the implementation of the Project or repudiates this Contract or otherwise takes any action, or evidences or conveys an intention not to be bound by the Contract;
c) IA, in the judgment of WBSEDCL, has engaged in corrupt, fraudulent, collusive, or coercive practices, in competing for or in executing the Contract; or
d) IA is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for IA or for the whole or material part of its assets that has a material bearing on its ability to implement the Project;
e) IA has been, or is in the process of being liquidated, dissolved, wound-up, amalgamated or reconstituted in a manner that in the reasonable opinion of WBSEDCL would adversely affect IA's ability to implement the Project;
f) A resolution for winding up of IA is passed, or any petition for winding up of IA is admitted by a court of competent jurisdiction and a Liquidator or Receiver is appointed and such order of appointment of Liquidator/Receiver has not been set aside within 90 (Ninety) days of the date thereof or IA is ordered to be wound up by a court of competent jurisdiction;

g) In the event IA fails to cure the default as indicated in the SLA Default Notice within the time-period specified therein;
h) Failure of IA to furnish Performance Security in accordance with the provisions of this Contract;
i) Failure of IA to provide Solution in accordance with Specifications as mentioned in the Scope of Work, Technical Specification and SLA mentioned in this NIT (bid document);
j) Any representation or warranty made by the IA during the term of the Contract is found to be false and/or misleading;
k) Failure on account of IA to abide by Applicable Laws and regulations;
l) The shareholding of the IA ceases to be in accordance with the provisions of this Contract;
m) No person having System Integration (SI) experience in terms of the NIT remains a share holder of the IA;
n) In the event equipment installed or proposed to be installed by the IA is found to have any embedded malware/ trojans/ cyberthreat;
o) IA fails to comply with the local content requirement as specified in the Bid Submission;
p) IA fails to comply with any of its material obligations under this Contract.

GCC.19.2. UTILITY EVENT OF DEFAULT

GCC.19.2.1. Utility Event of Default means any of the following events, unless such event has occurred as a consequence of the IA Event of Default or a Force Majeure event and where Utility has failed to remedy these events with in a period of 90 (ninety) days of issuance of a notice by IA requiring Utility to remedy such event:
a) Failure of Utility to pay the Monthly Payment Bill of IA in accordance with **GCC.23**. or any other payment due from Utility under this Contract and more than 90 (ninety) days have elapsed since such payments became due;
b) Utility is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for Utility or for the whole or material part of its assets that has a material bearing on its ability to perform its obligations under this Contract;
c) Utility has been, or is in the process of being liquidated, dissolved, wound-up, amalgamated or reconstituted in a manner that in the reasonable opinion of IA would adversely affect Utility's ability to perform its obligations under this Contract;
d) A resolution for winding up of Utility is passed, or any petition for winding up of Utility is admitted by a court of competent jurisdiction and a provisional liquidator or receiver is appointed and such order has not been set aside within 90 (Ninety) days of the date thereof or Utility is ordered to be wound up by a court of competent jurisdiction;
e) The breach by Utility of its obligations under this Contract which has an adverse effect on the performance of IA's obligations under this Contract.

GCC.19.3. TERMINATION FOR IMPLEMENTATION AGENCY (IA) EVENT FOR DEFAULT

GCC.19.3.1. Without prejudice to any other right or remedy which Utility may have in respect thereof under this Contract, upon the occurrence of IA Event of Default, Utility shall be entitled to terminate this Contract in the manner provided in **Clause 19.3.2**.

GCC.19.3.2. Utility shall issue a Preliminary Notice to IA providing 90 (Ninety) Days, or such extended period as the Utility may allow, to cure the underlying Event of Default. If IA fails to cure the underlying Event of Default within such period allowed, Utility shall be entitled to terminate this Contract by issuing a termination notice to IA.

GCC.19.4. TERMINATION FOR UTILITY EVENT FOR DEFAULT

GCC.19.4.1. Without prejudice to any other right or remedy which IA may have in respect thereof under this Contract, upon the occurrence of a Utility Event of Default, IA shall be entitled to terminate this Contract in the manner provided in **Clause GCC.19.4.2**.

GCC.19.4.2. IA shall issue a Preliminary Notice to Utility providing 90 (Ninety) Days, or such extended period as the IA may allow, to cure the underlying Event of Default. If Utility fails to cure the underlying Event of Default within such period allowed, IA shall be entitled to terminate this Contract by issuing a termination notice to Utility.

GCC.19.5. Upon Termination of the Contract, the IA shall:

GCC.19.5.1. Notwithstanding anything to the contrary contained in this Contract, any termination of this Contract pursuant to its term shall be without prejudice to accrued rights of any Party, including its right to claim and recover damages and other rights and remedies which it may have in law or contract. All accrued rights and obligations of any of the Parties under this Contract, shall survive the termination of this Contract to the extent such survival is necessary for giving effect to such rights and obligations.

GCC.19.5.2. Following issuance of the Termination Notice by Utility or IA, Utility take possession and control of **IA's control centre, installed assets and any other devices necessary to continue the business; and if any exclusivity granted to IA under this contract will come to an end.**

GCC.19.5.3. Upon termination of this Contract by Utility or IA on account of IA's Event of Default (in accordance with **Clause 19.1**), or termination of this Contract on account of Utility's event of default (in accordance with **Clause GCC.19.2**), IA shall be entitled to a termination payment subject to proper transfer of the installed AMI System, as agreed mutually upon, on the basis of the following criteria:

a) In case termination of this Contract on account of IA's event of default: Termination payment to IA after Work Completion has been declared shall be 50% of the termination payment Value as determined in terms of this Contract, and WBSEDCL should have the right to invoke and appropriate the entire amount of PBG without citing any cause thereof.

b) In case termination of this Contract on account of Utility's event of default: Termination payment to IA, after Work Completion has been declared, shall be 100% of the termination payment Value as determined in terms of this Contract.

c) In case termination of this Contract prior to Work Completion, the Termination payment shall be equal to:

i. 50% of the value of the assets proposed to be handed over to the Utility as certified by an independent valuer (Preferably Govt. Valuer) & the entire amount of PBG will be invoked in the event termination is on account of IA event of default– and

ii. 100% of the asset values shall be paid by the utility to the IA after deducting the total lumpsum amount as well as the proportionate asset cost already paid in the event of termination on account of Utility event of default.

d) In case termination of the Contract prior to- the Work Completion-The Goods that are complete and ready for shipment within 28 (twenty-eight) days after the IA's receipt of the Notice of Termination shall be considered while determining value of the assets proposed to be handed over to the Utility.

e) In the event of termination prior to Work Completion, Utility may request the IA to complete any part of the Solution. The cost of such works shall be agreed between the Parties. In the event Parties deem it appropriate the cost may be determined by the Independent Valuer (Preferably Govt. Valuer).

Upon termination of this Contract by Utility or IA on account of IA's Event of Default (in accordance with **Clause GCC.19.1**), or termination of this Contract on account of Utility's event of default (in accordance with **Clause GCC.19.2**), IA shall be entitled to raise a supplementary invoice for an amount which is equal to the termination payment. The Supplementary invoice shall be paid separately by the Utility within 60 (sixty) days from the date of such invoice.

GCC.19.5.4. The Termination payment value would be calculated basis the following mechanism:

a) The present value of the receivables for the AMI system installed shall be calculated by multiplying the outstanding meter-months of operating the AMI system with percentage of total meters installed, integrated and operationalized as on the date of termination, and AMI Service Charge, and discounting the same as on date of termination at 12% ("Present Value").

b) All amounts due, but not paid by the Utility, including the aggregated IA's Monthly Bill Payment, but not paid or recovered from the Utility, for the AMI system operations and maintenance as defined in the NIT by the IA, shall be calculated and factored in to arrive at the net outstanding receivables of the IA ("**Outstanding Receivables**");

c) All amounts due, but not paid by the IA, including the aggregated applicable liquidated damages and/(or) penalties due to non-compliance of SLAs by the IA, but not paid or recovered from the IA, for the Smart Metering system operations and maintenance as defined in the NIT by the IA, shall be calculated and factored in to arrive at the net outstanding payables by the IA ("**Outstanding Payables**");

d) Termination Payment Value shall be equal to the sum of Net Present Value and Outstanding Receivables as per **Clause GCC.19.5.4. (a)** and **(b)**; reduced by Outstanding Payables as per **Clause GCC.19.5.4. (c)** and the sum of insurance proceeds received by the IA for the AMI system (if any).

GCC.19.5.5. Upon Termination of the Contract or expiry of the contract period, the IA shall prepare and present a detailed Exit Management Plan within 5 (five) working days

of termination notice receipt to the Utility ("Exit Management Plan") in accordance with **GCC.16** to this Contract.

GCC.19.5.6. WBSEDCL or its nominated agency will review the Exit Management plan. If approved, IA shall start working on the same immediately. If the plan is rejected, IA shall prepare alternate plan within 2 (two) working days. If the second plan is also rejected, WBSEDCL will provide a plan for IA and it should be adhered by in totality.

GCC.19.5.7. The Exit Management Plan should cover at least the following:
a) Execute all documents that may be necessary to effectively transfer the ownership and title, including OEM warranties in respect of all equipment;
b) Handover all developed codes, related documentation and other Configurable Items, if any in his possession;
c) Handover the list of all IT Assets, passwords at all locations to WBSEDCL.
The IA and the Authorized personnel from WBSEDCL will sign a completion certificate at the end of successful completion (all points tracked to closure) of the Exit Management Plan.

GCC.20. Legal jurisdiction:

GCC.20.1. During execution of this contract, if any dispute arises thereby, it shall be settled amicably between the contracting parties.

GCC.20.2. All disputes or differences in respect of which the decision, if any, has not become final shall be settled by taking recourse of law at any competent Court under the judicature of Hon'ble High Court, Calcutta only.

GCC.20.3. All legal disputes for adjudication and / or court case shall be exclusively within the jurisdiction of Calcutta High Court or any subordinate court having competent jurisdiction at Kolkata only.

GCC.21. Conflict of interest:

GCC.21.1. The Bidder shall not have a Conflict of Interest that may affect the Tendering Process. Any Bidder found to have a Conflict of Interest as per the following reasons, shall be disqualified. In the event of disqualification, the Bid Security of the bidder shall be forfeited for the time, cost & effort of the Authority including consideration of such Bidder's Proposal, without prejudice to any other right or remedy that may be available to the Authority hereunder or otherwise.

GCC.21.2. Any bidder found to have a conflict of interest if his near relative is posted as an employee/ officer in any capacity in WBSEDCL, who is associated with the Tender inviting Authority or vice versa.

GCC.21.3. Any bidder found to have a conflict of interest if any employee of the bidding firm/company has or develops a financial or other interest with any employee / officer of WBSEDCL associated with the Tender inviting Authority during the execution of the Contract or vice versa.

GCC.21.4. Any bidder has a relationship with another bidder/bidders directly or through common third parties that puts them in a position to have access to each other's information about or to influence the tendering processes of either or each of the other bidder.

GCC.22. Liquidated damage (LD): The timely commissioning and configuration of entire system as per scope of LOA and start of delivery service throughout the total project is the basic consideration and essence of the contract and WBSEDCL reserves the right to repudiate the contract if the vendor fails to do the work within stipulated period. However, the ordering authority may at his discretion waive this condition with imposition of liquidated damage in case of delay due to WBSEDCL dependency.

GCC.22.1. Calculation of LD: During the contract period deviation of any condition attracts the penalty as LD. In case, there is a delay in installation & commissioning of meter Lot as per time schedule, Liquidated Damages shall be charged at a rate of 0.5% of the contract value of that unfinished portion for delay per week and recovered from the vendor subject to maximum of 10% of the that contract value.

GCC.22.2. If the vendor continuously deviates from the planed schedule after numbers of official reminder, then the LOA is liable to be cancelled and placed on an alternate tenderer at the risk and cost of the original tenderer, unless such failure is due to Force Majeure as defined or due to WBSEDCL defaults.

GCC.23. Payment:

GCC.23.1. The payment shall be made to the IA in Indian Rupees (INR) only.

GCC.23.2. The payment to the IA shall commence only after: Delivery, site installation, integration and made operational of each lot of the Smart Meters each with related hardware, software and equipment and successful Operational Go-Live of the system as defined in this Contract.

GCC.23.3. Terms of payment:

GCC.23.3.1. No advance payment will be made against this order in any circumstances for turn-key implementation of entire project. The first payment (CAPEX and OPEX) shall be made only after the completion of the commissioning of at least 5% of the total meters in the contract (Clause IB.22).

GCC.23.3.2. For all the phases**,** the payment shall be a summation of the three heads on monthly basis as mentioned below subject to clause **GCC.23.3.1**:

GCC.23.3.2.1. Lumpsum payment rate per meter (as per Table- Price Schedule as given in **GCC.25**) X total number of new smart meters delivered for which Lumpsum payment has not been made earlier (if any) x 75%, subject to successful sample meter testing and issuance of SRV thereafter as per clause **SW 28.5.6.2**.

GCC.23.3.2.2. Lumpsum payment rate per meter (as per Table- Price Schedule as given in **GCC.24**) X total number of new smart meters newly installed & commissioned at the consumer premises for which Lumpsum payment has not been made earlier (if any) x 25%. Payment of this 25% shall be made only for the successful availability of the online monthly billing data of the meter to MDMS thorough HES. Data collected manually through mobile app or other means shall not be taken into consideration for payment.

GCC.23.3.2.3. Service Charge (as per Table- Price Schedule as given in **GCC.24**) X total number of meters in operation, maintenance and successful online meter (excl. meter reading taken by mobile application) reading at the end of each month Post-Operational Go-Live after deduction as per SLA per month and LD, as applicable. For this case also, Data collected manually through mobile app or other means shall not be taken into consideration for payment.

GCC.23.3.3. The Monthly Payment as per above formula is final and beside that nothing more shall be Payable.

GCC.23.3.4. Payment for Replaced meter as per clause **SW.17.1** will be paid on actuals on submission of original invoice.

GCC.23.4. Submission of bills for payment:

GCC.23.4.1. All the bills in triplicate with relevant papers, documents are to be submitted for payment addressing to the Office of the chief Engineer, IT&C Cell, 3rd Floor, 'D' Block, Vidyut Bhawan, Kolkata – 700091. Bill submission date will be considered after successful acceptance of bill along with all supporting documents. After successful acceptance generally, payment will be processed within due date i.e. 30 working days.

GCC.23.4.2. Only successful billing data excluding meter reading taken by mobile application available through AMI as per clause **SW.22.**, will be considered for monthly billing purpose. 1st Monthly reading Bill of newly installed consumer smart meter can only be submitted after availability of reading data through AMI.

GCC.23.4.3. Triplicate monthly bill with SLA deductions supported with relevant documents, calculation sheet of performance certificate of AMI SYSTEM, compiled in one Excel format and the following certificates and reports are to be submitted to the Controlling Officer of the project. Only one consolidated bill on monthly basis per month can be placed for payment.

GCC.23.4.4. In case of first claim, of Monthly Payment bill for any Device then "Commissioning Certificates" **(ANNEXURE-XIX)**, signed by the concerned site officer and supervising officer is to be submitted as per clause **SW.31**.

GCC.23.4.5. For claim of Monthly Payment bill, System generated "Performance Certificate" (**ANNEXURE-XX**) as per SLA is required to be submitted on monthly basis as per clause **SW.32.**

GCC.24. Price Schedule:

GCC.24.1.: The price schedule and in the same context, the BoQ is divided into two parts: Part-1 shall be filled for the project cost and shall be used for price bid evaluation and Part-II should be filled for component-wise breakup of cost. Bidders should take care to fill all the required values for each of the designated cells.

The schedule is mentioned below and also can be found in **ANNEXURE-II** as BoQ.

Part-I (Price Evaluation Sheet)

Sl.	Item Description	Quantity (in nos.)	Units	Rate per unit meter incl. all taxes and duties excl. GST (in INR/month)	Lumpsum Payment per meter (in INR/meter)	Total cost of each category of meters excl. GST (in INR)
A	**B**	**C**	**D**	**E**	**F**	**G=C*((E*84)+F)**
Meters (with hardware equipment, software, SIM and service)						
1	EITHER 3 Phase whole current import-export meter having current rating of 20-100A OR 3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s	126	Nos.		6300	
2	3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s	12,348	Nos.		6,300	
3	3 Phase 11 kV meter having CT ratio 50/5 and accuracy class of 0.5s	10,115	Nos.		6,300	
4	3 Phase 33 kV meter having CT ratio 100/1 and accuracy class of 0.5s	584	Nos.		6,300	
5	3 Phase 132 kV meter having CT ratio 200/1 and accuracy class of 0.2s	477	Nos.		6,300	
TOTAL in Figures						

Part-2 (Component-wise cost breakup)

Sl.	Item Description	Quantity	Units	Rate per Quantity	Total cost of each category of meters excl. GST (in INR)
A	**B**	**C**	**D**	**E**	**F=C*E**
Component detail cost breakup					
1	Cost of EITHER 3 Phase whole current import-export meter having current rating of 20-100A excluding Communication module OR 3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s	126	Nos.		
2	Cost of 3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s excluding comm. module	12,348	Nos.		
3	Cost of 3 Phase 11 kV meter having CT ratio 50/5 and accuracy class of 0.5s excluding comm. module	10,115	Nos.		
4	Cost of 3 Phase 33 kV meter having CT ratio 100/1 and accuracy class of 0.5s excluding comm. module	584	Nos.		
5	Cost of 3 Phase 132 kV meter having CT ratio 200/1 and accuracy class of 0.2s excluding comm. module	603	Nos.		
6	Cost of Cellular Communication Module hardware (preferably having provision for 2 physical SIMs or one e-SIM) for Smart Meters	23,650	Nos.		
7	SIM charges	23,650	Nos.		
8	Servers for WBSEDCL DC	1	Lumpsum		
9	SAN storage for WBSEDCL DC	1	Lumpsum		
10	Backup solution for WBSEDCL DC	1	Lumpsum		
11	Other Hardware at WBSEDCL DC (Application Load Balancer, Switches, Desktops, Printer etc.)	1	Lumpsum		
12	Storage for WBSEDCL DR	1	Lumpsum		
13	OS License(s)	1	Lumpsum		
14	Virtualization Software License(s)	1	Lumpsum		
15	HES Application License(s)	1	Lumpsum		
16	MDMS Application License(s)	1	Lumpsum		
17	DB Application License(s)	1	Lumpsum		
18	Mobile app development (for meter installation, manual meter reading, Consumer app) as well as Consumer portal	1	Lumpsum		

19	Reporting and Data Analytics for WBSEDCL users.	1	Lumpsum		
20	Other license(s), if any	1	Lumpsum		
21	Project Manager for the contract period	1	Nos.		
22	Site Engineers for the contract period	5	Nos.		
23	Metering expert for the contract period	1	Nos.		
24	System Administrator for the contract period	1	Nos.		
25	System Integration expert for the contract period	1	Nos.		
26	Application Domain expert (HES) for the contract period	1	Nos.		
27	Application Domain expert (MDMS) for the contract period	1	Nos.		
28	Consumer Mobile app & portal	1	Nos.		
29	Technical staffs (for each Zonal & Region Office of WBSEDCL) for the contract period	1	Lumpsum		
30	Other charges, if any, for the contract period	1	Lumpsum		
TOTAL in Figures					

GCC.24.2. Meter should be delivered, installed and commissioned as per time schedule specified.

GCC.24.3. Component-wise price is to be provided.

GCC.24.4. 1st bill on any smart meter can only be claimed after system GO-LIVE of final acceptance of the system and availability of meter data through remote reading to HES.

GCC.24.5. NO SLA is applicable up to implementation period of 6 months.

GCC.24.5. Installation of meter before schedule timeline is allowed.

GCC.24.7. Delayed meter installation schedule will attract LD as well as the meter service period will be reduced as the end of contract date is fixed.

GCC.25. Price:

GCC.25.1. Incomplete or partial quotation will not be accepted and shall be liable to be rejected.

GCC.25.2. Price should be quoted in the Price Bid Sheet as per format given in **BoQ**. No deviation in any form in the Price Bid Sheet(s) is acceptable. The quoted price shall remain firm throughout the period of the contract and no adjustment shall be made to the contract price in respect of rise or fall in cost of Installation & Commissioning Charge.

GCC.26. Limitation of liability: Except in cases of gross negligence or willful misconduct:

GCC.26.1. Neither Party shall be liable to the other Party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the bidder to pay liquidated damages to WBSEDCL, and

GCC.26.2. The aggregate liability of Bidder to WBSEDCL, whether under the Order, in tort, or otherwise, shall not exceed the amount specified in the Contract Price. Provided that this limitation shall not apply to the cost of repairing of replacing defective equipment/solutions, or to any obligation of the bidder to indemnify WBSEDCL with respect to patent infringement

GCC.27. WBSEDCL personnel for liaison:

GCC.27.1. Controlling Officer: Chief Engineer, IT&C Cell- he would issue the completion certificate for the entire scope of work under the LoA.

GCC.27.2. Nodal Officer: Additional Chief Engineer, IT&C Cell- He would supervise & monitor all the activities overall.

GCC.27.3. Supervising Officer: Superintending/ Divisional Engineer, IT&C Cell- He would monitor detailed execution of the project.

GCC.27.4. Paying Authority: Manager (F&A), IT&C Cell, WBSEDCL.

Special Conditions of Contract (SCC)

SCC.1. The special conditions of the contract, as depicted here, shall supplement the sections like IB, SW & GCC etc. and wherever there is a conflict, the provision herein shall prevail over other sections of this document.

SCC.2. The manpower deployed by the successful bidder for completion of the job not have any right whatsoever in getting employment in WBSEDCL.

SCC.3. Any scheduled date, if subsequently, is declared as holiday by competent authority, the revised schedule will be notified duly. However, in absence of such notification, the next working day, with scheduled time and venue will be considered as scheduled and Bidder(s) would be intimated accordingly.

SCC.4. WBSEDCL reserves the right to disqualify such bidders who have a past track record of not meeting contractual obligations (either in part or in full) against earlier contracts entered into with any unit of WBSEDCL.

SCC.5. Conflict of Interest:

SCC.5.1 The Bidder shall not have a Conflict of Interest that may affect the Tendering Process. Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, the Bid Security of the bidder shall be forfeited for the time, cost and effort of the Authority including consideration of such Bidder's Proposal, without prejudice to any other right or remedy that may be available to the Authority hereunder or otherwise.

SCC.5.2 Any Bidder found to have a conflict of Interest if his near relative is posted as an employee/officer in any capacity in WBSEDCL, who is associated with the Tender Inviting Authority.

SCC.5.3 Any Bidder found to have a Conflict of Interest if any employee of the bidding firm/company has or develops a financial or other interest with any employee/officer of WBSEDCL associated with the Tender Inviting Authority during execution of the contract.

SCC.5.4 Any Bidder has a relationship with another Bidder/Bidders, directly or through common third parties, that puts them in a position to have access to each-others information about, or to influence the Tendering Process of either or each of the Bidder will be a conflict of interest.

SCC.6. Confidentiality:

SCC.6.1 The Bidder(s) has to agree not to use the Confidential Information in any way, except for the purpose of execution of the Scope of Work.

SCC.6.2 The Bidder(s) has to agree to use its best efforts to prevent and protect the Confidential Information, or any part thereof, from disclosure to any person other than WBSEDCL's employees having a need for disclosure in connection with Bidder(s)'s authorized use of the Confidential Information.

SCC.6.3 The Bidder(s) has to agree to take all steps reasonably necessary to protect the secrecy of the Confidential Information, and to prevent the Confidential Information from falling into the public domain or into the possession of unauthorized persons.

SCC.6.4 Ownership of Confidential Information: The Bidder(s) has to agree that all Confidential Information shall remain the property of WBSEDCL, and that WBSEDCL may use such Confidential Information for any purpose without obligation to the Bidder(s). Nothing contained herein shall be construed as granting or implying any transfer of rights to the Bidder(s) in the Confidential Information, or any patents or other intellectual property protecting or relating to the Confidential Information;

SCC.6.5 Survival of Rights and Obligations: The Terms of Confidentiality set hereinabove, shall be binding upon, inure to the benefit of, and be enforceable by (a) WBSEDCL, its successors, and assigns; and (b) the Bidder(s), its successors and assigns;

In brief, strict confidentiality shall be maintained with respect to the contents of the data to be handled by the successful bidder and, any violation of this confidentiality clause may be treated as breach of trust and would lead to any or all of the penal actions as detailed bellow:

I. Instant termination of the contract

II. Engaging other agencies to carry out the remaining work with the condition that the cost of such work will be borne by the defaulting Bidder(s).

23/07/2024

Chief Engineer,
IT&C Cell,
Vidyut Bhawan,
WBSEDCL

FORMS and ANNEXURES

Item	Description
FORM-I	Declaration of Mandatory Condition.
FORM-II	Checklist of Mandatory Condition.
FORM-III	List of Consortium Members/Sub-Contractor(s).
ANNEXURE-I	SLA: Service Level Agreements and Key Performance Indicators.
ANNEXURE-II	Item rate BoQ.
ANNEXURE-III	Format of Consortium Agreement to be entered amongst all Members of a bidding Consortium.
ANNEXURE-IV	Format of Power of Attorney by Consortium Member in favour of Lead Consortium Member.
ANNEXURE-V	Format of Power of Attorney by Lead Consortium Member authorizing an Individual Designated Representative for the Consortium.
ANNEXURE-VI	Format of Letter of Consent by Consortium Member reviewing each element of the Bid.
ANNEXURE-VII	Bid Proposal.
ANNEXURE-VIII	Pro-forma of Bank Guarantee for Bid Guarantee.
ANNEXURE-IX	Data Requirement Sheet.
ANNEXURE-X	Techno-Commercial Deviation Sheet.
ANNEXURE-XI	Proposed Key Resource Format.
ANNEXURE-XII	Pre-bid query Format.
ANNEXURE-XIII	Pro-forma of Declaration of Black-Listing.
ANNEXURE-XIV	Pro-forma of Declaration Regarding abandonment or Rescission of Work.
ANNEXURE-XV	Manufacturer Authorization Form
ANNEXURE-XVI	Pro-forma of Contract Agreement.
ANNEXURE-XVII	Format for Bank Guarantee for contract Performance.
ANNEXURE-XVIII	Format of Indemnity Bond.

Item	Description
ANNEXURE-XVIX	Format of Installation Certificate.
ANNEXURE-XX	Format of Commissioning Confirmation.
ANNEXURE-XXI	Format of the Performance Certificate.
ANNEXURE-XXII	Format for Additional Bank Guarantee for contract Performance.
ANNEXURE-XXIII	Format for Non-Disclosure Agreement (NDA).
ANNEXURE-XXIV	Format for Change Request Form.
ANNEXURE-XXV	Third-party declaration Form.
ANNEXURE-XXVI	Format for undertaking for quotation submission against serial no.1 of BOQ PART-I & PART-II

FORM-I: DECLARATION OF MANADATORY CRITERIA/PRE-QUALIFICATION CRITERIA

Qualifying Requirements (QR)of Bidder				
Sl.	**Description**	**Qualification Criteria**	**Evaluation/ Document Required**	**Submitted Yes/NO**
(A)General Pre-qualification Criteria of Bidder				
1	Bidders Identity	The bidder shall be a private/public Company registered under Companies Act 1956 / 2013 proprietary firm /partnership firm. [The bidder / Each Member of Consortium/ Sub-Contractor needs to satisfy this condition]	Certificate of Incorporation and Registration.	
2	Quality Certification	The Bidder should be an ISO9001:2008 certified. OR Bidder should have CMMI Level 3 (minimum)certification. [In case of consortium both the lead bidder and consortium partners need to satisfy this condition]	A valid ISO/ CMMi certificate on or before the date of publication of the tender.	
3	Experience	a) The Bidder must have successfully executed & implemented AMR/AMI projects (meeting any of the below criteria) in an Indian/ Global Power Distribution Utility/ Distribution Franchisee in the last 7 years (i.e. FY 2017-18 to till the previous date of publication of this tender). b) Successfully executed AMR/AMI project covering implementation of minimum 20,000 nos. of Meters with required hardware, software and other associated accessories (Consisting of smart meters, GPRS Access Point and HES) in a single/ multiple contract and project/ projects should have been operational for at least 1 year in last 7 years. **[In case of Power Distribution Licensee to meet the QR, the licensee can use the credentials of its own or through its majorly owned subsidiary]**	List of clients and individual Client's PO/WO/LOI/LOA/ Contract/ Certification on client letter head and Performance certificate and contact details of clients as proof provided for the last 7 years needs to be submitted.	

4	Financial Strength	a) The bidder should have average annual turnover of Rs. 100 Crores during last three financial years ending on 31- Mar-2023 (i.e. for the F.Y. 2020-21,2021-22&2022-23). [In case of consortium bids, Minimum 50% to be met by Lead Bidder and balance to be met by other consortium members]	Income Tax return, All enclosures forming the part of Income Tax return (as applicable) and Audited Balance Sheet and certificate from Chartered Accountant stating turnover from each relevant line of business	
		b) The bidder should have a minimum working capital or its sanctioned limit of Rs.20 Crores during financial year ending on 31-Mar-2023. [In case of consortium bids, Minimum 50% to be met by Lead Bidder and balance to be met by other consortium members]	Audit report for company registered under Company's Act & Tax Audit report for others to be submitted as a proof of net worth. In case of sanctioned limit, Bank sanctioned letter of the limit / Company secretary signed certification is Required.	
		c)Net Worth for each of the last three Financial Years should be positive. Consider Financial year ending on 31-Mar-2023 (i.e. for the F.Y. 2020-21,2021-22&2022-23). [In case of consortium, all need to satisfy this condition]	**FORM- II(B)** with Attachments. (duly audited and approved by Authorized Audit Firm /CA)	
5	Workforce Capability	The Bidder should have at least 15 personnel on its rolls with a minimum AMR/AMI implementation experience. The details of experience, roles & responsibilities of the personnel should be as per **SW.25**.	Signed resume of employees need to be submitted as per enclosed format in **ANNEXURE-XI.**	

6	OEM Implementat-ion Partner Status	The bidder should be an authorized implementation partner of OEM products proposed in the bid and should possess all the necessary authorizations of the OEM in order to supply, customize, implement and support their OEM solutions.	Authorization letter from OEM for next 10 years back to back support of as per the format attach for Manufacturer's Authorization form (MAF) **ANNEXURE-XV**	
7	Authentication	Bidder must submit a certificate on company letterhead, stating that the bidder hasn't been blacklisted by any institution/organization/society/company of the Central / State Government ministry/department, or its public sector organizations during the last five years, with company stamp and signed by authorized signatory. [In case of consortium all need to satisfy this condition]	Self-Certificate on company letterhead with company stamp and signed by authorized signatory as per **ANNEXURE-XIII** and **ANNEXURE-XIV**.	
8	Office Location	Bidder shall have a registered office and operations in India for at least one year prior to submission of the bid. [In case of consortium, each member of consortium also shall have registered office in India]	Certificate of Incorporation/ Registration Documents should be submitted as proof of the same.	
(B) Qualification Requirement for SI (To be satisfied by the System Integrator only)				
1	Quality Assurance	1. The SI should be an ISO41001:2018 certified. 2. SI should have CMMI Level3 certification. 3. SI should have ISO27001:2013 or latest certifications.	Valid ISO and CMMI certificate on or before the date of bid submission of the tender.	
2	Large Projects Implementation Experience	The SI should have implemented the Billing system for power distribution Utility in Global/India for Minimum 10 Lakhs Consumers in last 10 years and system till the date of publication of this tender.	Purchase orders/Work award/ work order from End Customer/Certific ate from the client on successful implementation and operation of the project. (Power Utility) with detailed	

			Scope of work.	
3	Integration capability between HES/ MDAS With utility systems	System Integrator must have successfully executed AMI projects (Implemented HES / MDAS system and Integrated with MDM / Utility Billing System) with cumulative installation base of Minimum 1.5 lakh smart meters in the last 5 years till the date of publication of this tender.	Purchase orders/ Work award/ work order from End Customer/Certificate from the client on successful implementation and operation of the project (Power Utility) with detailed Scope of work.	
(C) Qualification Requirement for DL (To be satisfied by the Power Distribution Licensee only)				
1	Authenticati-on	Distribution licensee in India for last 5 consecutive years immediately preceding the Bid due date.	Self-attested copy of the license document as per the act.	
2	Quality Certification	Bidder should have ISO9001:2015 certificate	Copy of valid certificate	
3	Work Experience	Distribution Licensee (on its own or through its majorly owned subsidiary) must have successfully executed &implemented AMI Projects for minimum 20,000 metering points for its own consumers and such projects should be in operation for at least one-year as on Bid Date.	Evidence of such deployment along with PO/WO/LoA/Contract/Appropriate Certification from the ordering authority.	
(D)Qualification Requirement for MM/ Proposed MM (To be satisfied by the Meter Manufacturer only)				
1	Technical Experience	The MM should be in the business of manufacturing Static and Smart Energy Meters and should have state of the art facility in India. Should be in Metering Business for at least 10 years as on date of Bid Submission.	Factory License Certificate/MoA mentioning nature of Business. Purchase orders/ Framework agreements for this duration or other documents that prove this aspect.	

2	Smart meter Experience	The MM must have successfully Supplied / Implemented 1,00,000 Smart Meters in AMI projects in Indian/ Global Power Distribution Utility in the last 10 years as Main Bidder, Consortium member/Sub-contractor (as on date of Bid Submission date)	Individual Client's PO/ WO/LOA/Contract / Certification on client letter head.	
3	Capacity	MM/ Proposed MM should have experience of manufacturing and supply of Static electricity meters/Smart electricity meters. Minimum 10,000 Three phase CT operated Meters or 5,000 Three Phase CT operated Smart Meter per annum	Proof of Work order & performance certificate/ work order completion certificate to be submitted.	
4	ISI Certification	Smart Meters offered should meet the relevant standards applicable in India IS: 16444 with latest amendment' and should have BIS Certification for each type of meters as mentioned in the NIT.	Copy of Certificate for each type of offered Smart Meter as mentioned in the NIT should be furnished.	
5	Quality	MM should have valid ISO9001 & 14001for the Manufacturing facility as on the bid submission date.	ISO certificate	
6	Testing facility	The bidder should have in-house NABL accredited Laboratory Inside his factory premises.	A valid registration certificate mentioning issue/ renewal/ expiry date	
(E)	**Qualification Requirement for Proposed Head End System**			
1	Experience	The proposed HES must have following deployment capabilities in Indian/Global Utilities: • Successfully Commissioned cumulative 5 Lakhs endpoints in AMI project. • Single Large AMI deployment experience of at least 30,000 Smart meters, with RF or cellular communication. • In case the bidder offers meters for this project from different meter manufacturers, the offered HES system should be inter-operable amongst at least 3 different meter	Purchase order/Completion/ Go-live certification from client. Client certification with name, contact number and email with all required information (WBSEDCL may contact the client for verification purpose only)	

		brands operating on single network and Head End System. However, if the bidder offers meters for this project from a single meter manufacturer, the said HES shall operate on single network and Head End System for those meters from that meter manufacturer. • Successful integration of HES with COTS MDMS product. All projects should be in operations as on bid submission date.		
(F) **Qualification Requirement for Proposed Meter data Management System (MDMS)**				
1	Experience	• The proposed MDM solution should have been successfully integrated with preferably at least 2 (two) nos. of different HES solutions in Indian/ Global Utility(ies) (power/ water/ natural gas/ telecom) in last 7 (seven) years. • The proposed MDM solution should have been successfully integrated with at least 2 (two) nos. of different Billing Systems in Indian/ Global Utility(ies) (power/ water/ natural gas/ telecom) or with Billing/ Other IT systems of 2 (two) different Indian/ Global Utility(ies) in last 7 (seven) years. • Product Capability (OEM) of MDMS: Proposed MDM solution should have been implemented globally for a minimum of aggregated 5 Lakhs number of consumers/ metering points in AMI/ AMR setup with each deployment handling interval meter reads (15/30 mins or any Demand Integration Period (DIP) specified by WBERC regulations and its amendments from time to time).	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date. *(In case Non-Disclosure agreement (NDA) is signed with the client, Bidder shall provide an undertaking for the NDA and shall also provide a client certification as proof of experience along with Client Name/ Email Address/ Contact no./ designation etc.)* b) Documentary evidence of completion of the Project or completion of Go-live status (i.e., Go-live certificate, UAT testing certificate etc.) of	

			the respective project as per the definition of Go-Live/ UAT specified therein or other documentary evidence indicating completion (e.g., proof of payment received/ proof of asset capitalized in books of accounts (as applicable) and client certificate for supply of material or similar proofs) along with contact details of the client. c) Certificate / report issued by Client / HES OEM/ solution provider. In case the MDMS solution provider, has integrated with their own HES, then a self-certification shall be provided. d) Any other documentation for implementation performance/ operation.	
2	Certification	Should have CMMi (Capability Maturity Model Integration) Level 3 or IEC/ISO 27001 Certification (Software Development & Customization), as the requirement may be	Copy of valid certificate	

FORM- II (A): Checklist of Mandatory Conditions

West Bengal State Electricity Distribution Company Limited				
Tender Notice No. WBSEDCL/IT&C/33.10(iv)/ Dt.				
Details of information to be provided in support of Mandatory condition (copy of Supporting document to be submitted with the bid)				
Sl. No.	Item Details	Details		
1	Contact Person with Telephone No., Mobile No., E-mail ID and FAX No. of the Bidder.			
2	Communication details of Service Centre at Kolkata			
3	PF Registration No.			
4	Permanent Account No. (PAN)			
5	Sales Tax Registration No.			
6	GST registration No.			
7	Service Tax Registration No.			
8	SSC Code of GST			
9	GST Registration No.			
10	Company Registration No.			
11	Annual Turn Over for each of last three financial years	2020- ’21 (in crore)	2021-’22 (in crore)	2022- ‘23 (in crore)

12	Orders received and executed by the bidder	Organization where worked with Contact Telephone No. and FAX No.	Order No. and Date with Value of the Order	Completion/ ongoing Certificate with date (indicating order Reference no.)
	Signature of the Bidder with Seal			

FORM- II (B): Historical Financial Performance

Bidder's Legal Name: _____ Date: _____ JV Member Legal Name: _____

Page _____of _____pages

To be completed by the Bidder and, if JV, by each member:

Financial information	Historicinformationforprevious3years				
	Year 1	Year 2	Year 3	Avg.	Avg. Ratio
Information from Balance Sheet					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					

Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:

(a) Must reflect the financial situation of the Bidder or member to a Consortium/JV. In case entity claiming financial capability of its Parent(s) and/ or its Affiliate(s) for the purpose of meeting the qualification requirements; financial situation of its Parent(s) and/ or its Affiliate(s) to be mentioned separately.

(b) Historic financial statements must be audited by a certified accountant

(c) Historic financial statements must be complete, including all notes to the financial statements

(d) Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)

FORM-III: List of Consortium Members/ Sub-Contractor(s)

[The Bidder shall identify below the Consortium Members/ Sub-contractor(s) for major Project items. For sub-contractor a Letter of Intent must be provided.]

Major Project Item	Proposed Consortium Member/Sub Contractor(s)	Nationality
Meter Manufacturer (if any)		
Communication Provider (if any)		
System Integrator (if any)		
HES Provider (if any)		
MDMS Provider (if any)		
[Other] (if any)		

ANNEXURE-I: SLA

Sl. No.	SLA Parameters	SLA Deductions
1	**During installation and commissioning period** up to 6 months from the date of issuance of LoA.	**No Deduction**
1.1	1st Bill can be submitted after availability of billing data through AMI after commissioning of the 5% of total meters	**No Deductions**
After installation and commissioning period (Beyond 6 months) from the date of issuance of LoA). The availability of data will be considered for online AMI reading only excluding data acquired through mobile app.		
2. Billing Data read Availability (As per SW.22)		
2.1.1	Up to **95%** availability of AMI billing data	**No Deductions.**
2.1.2	Then after for every reduction in AMI billing data by 1% up to **75%** of data availability.	**Deduction of 2% of the monthly invoice will be done.** (e.g.: for 75% AMI billing data availability 40% deduction of bill amount will be done)
2.1.3	Less than **75%** availability of AMI billing data	**No amount will be paid.**
3. Scheduled Data Reading of Other Profiles		
3.1.1	Instantaneous Data from 95% of meters within 8 hours	**No deductions.**
3.1.2	Thereafter for reduction of every 0.5% data	Deduction of 0.2% of the monthly invoice-Maximum up to 2% penalty
3.2.1	Load profile Data from 95 % of Meters within12 hours	**No deductions.**
3.2.2	Thereafter for reduction of every 0.5% data	Deduction of 0.5% of the monthly invoice-Maximum up to 3% penalty
3.3.1	Daily Profile data (Midnight Data in TOD form) from 95% of meters within 24 hours after midnight	**No deductions.**
3.3.2	Thereafter for reduction of every 0.5% data	Deduction of 0.1% of the monthly invoice-Maximum up to 1% penalty
4. On-Demand Remote reads of meters (data strength: Collection of 7 days of interval energy or similar)		
4.1	From 90% of the meters in 30 Minutes	**No deductions.**
4.2	Thereafter for reduction of every 0.5% data	Deduction of 0.2% of the monthly invoice-Maximum up to 2% penalty
5. Remote Firmware upgrade with acknowledgement/response for selected meters		
6.1	Action performed 99.9% of meters within 24 hours	**No deductions.**

6.2	Then after reduction of every 0.5%	Deduction of 0.5% of the monthly invoice-Maximum up to 3% penalty
6. Availability of AMI System per month		
7.1	Availability>=100%	**No deductions.**
7.2	Thereafter for reduction of every 0.5% availability	Deduction of 0.5% of the monthly invoice-Maximum up to 6% penalty

Conditions:

1. The deduction shall be computed as IA's Monthly Invoice X penalty % as computed in above table.

2. Assuming on i-th day or event, action was done on Y_i% of total meters and within stipulated time, data was received from Zi% of Yi% meters. So, the average SLA over the month shall be computed as: $\Sigma(Y_i*Z_i)/\Sigma(Y_i)$

3. For system availability, the availability is computed as: (THM-(S1*1+S2*.8+ S3*.6))/THM where THM is scheduled operating hours for the month; All planned downtime (for maintenance) would be deducted from the total operation time for the month to give the scheduled operation time. All planned downtime should be pre-approved from competent authority of WBSEDCL.

S1/S2/S3 is the total non-available hours in Severity Level-1/Level-2/Level-3(Given Below)

4. Exclusions: Power Outages, Meter by pass by consumers, Local Temporary/ Permanent disconnection by Utilities, Meter burnt shall be excluded from above SLA calculations.

5. For seamless integration between MDMS and HES system coordination from both vendors are required; though service orders, commands and data flow between two systems will be monitored by integrating tool as well as both system end and the reports, logs etc. from both systems will ensure fault of any sub-system fault. If fault is found from this bidder's scope then suitable SLA will be applied on him.

6. IA shall submit system generated reports for cases mentioned above based on data available in HES/ MDM. For the balance cases, joint visit of IA and Utility officials shall be carried out and field inspection report shall be submitted by IA to Utility for suitable action.

7. For the purpose of joint visit, IA shall put a request to Utility who should allocate manpower for joint visit within 3 working days. In case of non-allocation/ non-availability of manpower from Utility, the report submitted by IA shall be final and action able by Utility.

8. The penalties would be computed on the basis of performance of IA for a calendar month.

System Availability: AMI system issues and availability are flagged at three different severity levels.

a. Severity 1 is the most critical being a complete system level failure or breach of IT policies and requiring urgent and immediate attention.

b. Coverage under severity 2 are outages that do not cause any immediate disruption but subsequently may result into severity1 outage.

c. Severity 3 are those issues/ problems/ outages which are neither of an emergency nor priority level as grouped under severity level 1or 2.

d. Change Request (CR)are related to functional modification, change in business process, reporting, viewing etc.

The IA shall implement an appropriate online SLA Application for problem/defect reporting and tracking system. This would enable logging and tracking of outages / defects/non-conformances of all severity levels and get the approval of the same from WBSEDCL towards desired resolution. The incidents are categorized as mentioned in table below:

Category	Definition
Severity 1 – Urgent	Complete system failure, severe system instability, loss or failure of any major subsystem component such as to cause significant numbers of end-users are impacted. Partial outage of HES functions unavailability of Utility user interface Any functional loss or subsystem failure due to interruption in communication link fail Stoppage of data backup as per requirement Cyber Security issues leading to unauthorized access to systems/applications
Severity 2 – Serious	Outage at Network Operation cum Monitoring. Centre Failure of any Integration service. Any application performance issue that occurring slow system response and not meeting with individual KPIs, Unavailability of manpower as per contract Non-availability of required inventory of spares specified as per requirement Data unavailability in MDMS from data collection source i.e. HES Interruption of data exchange with utility enterprise systems Not adherence to RTO, RPO Applications not following the volumetric parameters: i. Partial outage of AMI functions ii.Outage of VEE iii.Billing Determinants iv. Reports v.Breach of data privacy
Severity 3 – Minor	Non-availability of reports as per requirement. Resolution of complaint ticket raised and passed on by CCS [These complaintsshallberegisteredwithintheSLAApplicationandhenceshallhavetoundergo mutual agreement checks between Utility/IA before being registered for resolution]. Moderate loss of performance resulting in multiple users (including public users) or certain group of users of any logical subset. Mal functioning of any functional module or minor bug in function. Any exception related to business function. Change in report data etc.
Severity 4- Change Request (CR)	Any change request related to functional modification, change in business process, reporting, viewing etc. Change request will be resolved within mutually agreed timeline and penalty measure according to criticality of the CR.

Response & Resolution Time: The target times within which the IA should respond to support requests for each category of severity is described in the following table:

a. The Initial Response Time is defined as the period from the initial logging of the support request (through established systems and/or communications channels) and the acknowledgment of the IA subject to the maximum time defined in the following table. In case, IA doesn't respond within initial response time, the support shall be deemed acknowledged by the IA.

b. The Action Resolution Time is the period from the acknowledgement of support request to the IA delivering a solution subject to the Maximum time defined in following table.

c. The Action Resolution Time includes investigation time and consideration of alternative courses of action to remedy the situation.

Severity	Initial Response Time (Working Hours)	Initial Response Time (Non-Working Hours)	Maximum Action Resolution Time	Action
1	15 minutes	30 minutes	2 hours	An urgent or emergency situation requiring continuous attention from necessary support staff until system operation is restored– may be by Workaround.
2	15 minutes	20 Hours	24Hours	Attempt to find a solution acceptable to WBSEDCL (dependent on reproducibility), as quickly as practical.
3	2 hours	1 day	10 days	Evaluation and action plan. Resolution time is dependent on reproducibility, ability to gather data, and WBSEDCL's prioritization. Resolution may be by Workaround.
4	24 hours	48 Hours	Mutually agreed time	Change request will be resolved within mutually agreed timeline between IA and utility depends on the criticality.

Service Response Requirements:

Emergency Support for Severity 1 issues are to be provided 24 hours a day, seven days a week. The on-call support team shall include all key technical competencies so that any aspect of a system failure can be attended to. Severity 1 issues shall be reported by telephone for rapid response; the key objective is to restore the system to an operational state as quickly as possible.

System level issues/availability calculation methodology shall be as below:

a) For Severity-1 and 2 level incidents, the non-availability hours for availability calculation shall be counted from the end of the allowed Action Resolution time for their first instance in a given month. If any incident, repeats in the same month, the non-availability hours for availability calculation shall be counted from the end of allowed Initial Response Time.

b) For Severity-3events, the non-availability hours for availability calculation shall be counted from the end of the allowed Action Resolution time A standardized online ticket register shall be maintained, that shall be made available to utility online, containing the following:

Details of each issue reported:

a) Actions taken by IA to correct the issue
b) Applicable Severity level
c) Time of reporting to the IA support engineer/support
d) Actual vs Allowed response & resolution time as defined in this annexure
e) Review of utility's Engineer-in-charge as well as the IA's support engineer of the site.

In the event of multiple failures at a site, due to a common cause, the first FPR (Field Problem Report) logged shall be used for the purpose of system availability calculation. However, simultaneous multiple outages due to unrelated cause would be counted separately. Availability computation shall be done on monthly basis in selected area(s) of operation. The formula to be used for availability computation shall be as under:

Availability per Month=(THM-(S1*1+S2*0.8+S3*0.6))/THM

SLA change process: The parties may amend this SLA by mutual agreement. Changes can be proposed by either party. The Bidder representative may initiate a 'SLA review' at least half-yearly which is subject to approval from WBSEDCL. The Bidder representative will maintain and distribute current copies of the SLA document as directed by WBSEDCL. Additional copies of the current SLA will be available at all times to authorized parties.

ANNEXURE-II:

A: BoQ FORMAT

Price BID for Smart Meter Systems for consumers of WBSEDCL having CL>=50 kVA

Part-I (Bid evaluation sheet)

Sl.	Item Description	Quantity (in nos.)	Units	Rate per unit meter incl. all taxes and duties excl. GST (in INR/month)	Lumpsum Payment per meter (in INR/meter)	Total cost of each category of meters excl. GST (in INR)
A	B	C	D	E	F	G=C*((E*84) +F)
Meters (with hardware equipment, software, SIM and service)						
1	**EITHER** 3 phase whole current import-export meter having current rating of 20-100 A **OR** 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s	126	Nos.		6300	
2	3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s	12,348	Nos.		6,300	
3	3 Phase 11 kV meter having CT ratio 50/5 and accuracy class of 0.5s	10,115	Nos.		6,300	
4	3 Phase 33 kV meter having CT ratio 100/1 and accuracy class of 0.5s	584	Nos.		6,300	
5	3 Phase 132 kV meter having CT ratio 200/1 and accuracy class of 0.2s	477	Nos.		6,300	
TOTAL in Figures						

Part-II (Component-wise cost breakup)

Sl.	Item Description	Quantity	Units	Rate per Quantity	Total cost of each category of meters excl. GST (in INR)
A	B	C	D	E	F=C*E
Component detail cost breakup					
1	**EITHER** Cost of 3 phase whole current import-export meter having current rating of 20-100 A **OR** Cost of 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s	126	Nos.		
2	Cost of 3 Phase LT-CT meter having CT ratio 200/5 and accuracy class of 0.5s excluding comm. module	12,348	Nos.		
3	Cost of 3 Phase 11 kV meter having CT ratio 50/5 and accuracy class of 0.5s excluding comm. module	10,115	Nos.		
4	Cost of 3 Phase 33 kV meter having CT ratio 100/1 and accuracy class of 0.5s excluding comm. module	584	Nos.		
5	Cost of 3 Phase 132 kV meter having CT ratio 200/1 and accuracy class of 0.2s excluding comm. module	477	Nos.		
6	Cost of Cellular Communication Module hardware (preferably having provision for 2 physical SIMs or one e-SIM) for Smart Meters	23,650	Nos.		
7	SIM charges	23,650	Nos.		
8	Servers for WBSEDCL DC	1	Lumpsum		
9	SAN storage for WBSEDCL DC	1	Lumpsum		
10	Backup solution for WBSEDCL DC	1	Lumpsum		
11	Other Hardware at WBSEDCL DC (Application Load Balancer, Switches, Desktops, Printer etc.)	1	Lumpsum		
12	Storage for WBSEDCL DR	1	Lumpsum		
13	OS License(s)	1	Lumpsum		
14	Virtualization Software License(s)	1	Lumpsum		
15	HES Application License(s)	1	Lumpsum		
16	MDMS Application License(s)	1	Lumpsum		
17	DB Application License(s)	1	Lumpsum		
18	Mobile app development (for meter installation, manual meter reading, Consumer app) as well as Consumer portal	1	Lumpsum		

19	Reporting and Data Analytics for WBSEDCL users.	1	Lumpsum		
20	Other license(s), if any	1	Lumpsum		
21	Project Manager for the contract period	1	Nos.		
22	Site Engineers for the contract period	5	Nos.		
23	Metering expert for the contract period	1	Nos.		
24	System Administrator for the contract period	1	Nos.		
25	System Integration expert for the contract period	1	Nos.		
26	Application Domain expert (HES) for the contract period	1	Nos.		
27	Application Domain expert (MDMS) for the contract period	1	Nos.		
28	Consumer Mobile app & portal	1	Nos.		
29	Technical staffs (for each Zonal & Region Office of WBSEDCL) for the contract period	1	Lumpsum		
30	Other charges, if any, for the contract period	1	Lumpsum		
TOTAL in Figures					

NOTE: -

(a) GST shall be allowed over and above the contract price at the prevailing rate in force.
(b) Price bid is to be submitted strictly as per above format in two sheets i.e. Part-I and II.
(c) All the columns should be duly filled in for both the sheets i.e. Part-I and Part-II of the BoQ.
(d) Partial & incomplete quotation will not be Accepted.
(e) While entering the figures in BoQ for quotation, the bidder should opt for entering values for serial no. 1 of the modified BoQ as per the condition stated in the following:
    i) EITHER FOR
    3-phase whole current import-export meter having current rating 20-100A
    ii) OR
    3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s.

Bidders can submit quotation for either one type of meter but not for both.

(f) The bidder has to declare as follows: -

"We hereby declare that in quoting the above price, we have taken into account the entire Scope of Work along with all statutory taxes and levies as applicable till date except GST".

Signature of the bidder with Office Seal

Dated----------

ANNEXURE-III: Format of Consortium Agreement to be entered amongst all Members of a bidding Consortium

[To be on non-judicial stamp paper of Rupees One Hundred Only (INR 100/-) or appropriate value as per Stamp Act relevant to place of execution, duly signed on each page. Foreign entities submitting Bid are required to follow the applicable law in their country.]

FORM OF CONSORTIUM AGREEMENT BETWEEN M/s....., M/s., M/s. ....., AND M/s. for bidding for Tender No.…… dated ……as per its Clause IB.2.4.

THIS Consortium Agreement (hereinafter referred to as "Agreement") executed on this ..... [date] day of ..... [month], ……. [year] between:

1. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at……., (hereinafter called the "**Party1**," which expression shall include its successors, executors and permitted assigns);

2. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at……., (hereinafter called the "**Party2**," which expression shall include its successors, executors and permitted assigns);

3. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at……., (hereinafter called the "**Party3**," which expression shall include its successors, executors and permitted assigns);

[The Bidding Consortium should list the name, address of its registered office and other details of all the Consortium Members above.]

for the purpose of submitting the Bid in response to the Tender and in the event of selection as Selected Bidder to comply with the requirements as specified in the tender document and ensure execution of the Tender Document as may be required to be entered into with WBSEDCL.

Party 1, Party 2, Party 3, and Party n are hereinafter collectively referred to as the "Parties" and individually as a "Party.

WHEREAS Bid document stipulates that the Bidders qualifying on the strength of a Bidding Consortium shall submit a legally enforceable Consortium Agreement in a format specified in the document, whereby each Consortium Member undertakes to be liable for its Roles and Responsibilities, provide necessary guarantees and pay required fees as required as per the provisions of the tender document, as specified herein.

WHEREAS any capitalized term in this Agreement shall have the meaning ascribed to such term in the tender document.

NOW THEREFORE, THIS INDENTURE WITNESSTH AS UNDER:

In consideration of the above premises and agreement all the Parties in this Consortium do hereby mutually agree as follows:

1. In consideration of the selection of the Consortium as the Bidding Consortium by WBSEDCL, we the Members of the Consortium and Parties to the Consortium Agreement do hereby unequivocally agree that M/s…… *[Insert name of the Lead Member]*, shall act as the Lead Member as defined in the RFP for self and agent for and on behalf of M/s. ....., M/s., M/s....., and M/s…… *[the names of all the other Members of the Consortium to be filled in here].*

2. The Lead Consortium Member is hereby authorized by the Members of Consortium and Parties to the Consortium Agreement to bind the Consortium and receive instructions for and on behalf of all Members. The Roles and Responsibilities of all other members shall be as per the **Annexure** to this Agreement.

3. The Lead Consortium Member shall be liable and responsible for ensuring the individual and collective commitment of each of the Members of the Consortium in discharging all their respective Roles and Responsibilities. Each Consortium Member further undertakes to be individually liable for the performance of its part of the Roles and Responsibilities without in any way limiting the scope of collective liability envisaged in this Agreement in order to meet the requirements and obligations of the Tender.

4. In case of any breach of any of the commitment as specified under this Agreement by any of the Consortium Members, then all Members of the Consortium and Parties shall be liable to meet the obligations as defined under this Tender.

5. Except as specified in the Agreement, it is agreed that sharing of responsibilities as aforesaid and obligations thereto shall not in any way be a limitation of responsibility of the Lead Member under these presents.

6. This Consortium Agreement shall be construed and interpreted in accordance with the Laws of India and Courts at KOLKATA shall have the exclusive jurisdiction in all matters relating thereto and arising there under.

7. It is hereby agreed that the Lead Consortium Member shall furnish the Bid Security, as stipulated in the Tender, on behalf of the Bidding Consortium.

8. It is hereby agreed that in case of selection of Bidding Consortium as the Project Implementing Consortium, the Parties to this Consortium Agreement do hereby agree that they shall furnish the Performance Security and other commitments to WBSEDCL as stipulated in the Tender. The Lead Member shall be responsible for ensuring the submission of the Performance Security and other commitments on behalf of all the Consortium Members.

9. It is further expressly agreed that the Consortium Agreement shall be irrevocable and, for the Project Implementing Consortium, shall remain valid over the term of the Project, unless expressly agreed to the contrary by WBSEDCL.

10. The Lead Consortium Member is authorized and shall be fully responsible for the accuracy and veracity of the representations and information submitted by the Consortium Members respectively from time to time in response to the RFP for the purposes of the Bid.

11. It is expressly understood and agreed between the Members of the Consortium and Parties that the responsibilities and obligations of each of the Members shall be as delineated as annexed hereto as **Annexure** forming integral part of this Agreement. It is further agreed by the Members that the above sharing of

responsibilities and obligations shall not in any way be a limitation of responsibilities and liabilities of the Members, with regards to all matters
relating to the execution of the Bid and implementation of the Project envisaged in the TENDER Documents.

12. It is clearly agreed that the Lead Consortium Member shall ensure performance indicated in the TENDER and if one or more Consortium Members fail to perform its/their respective obligations, the same shall be deemed to be a default by all the Consortium Members.

13. It is hereby expressly agreed between the Parties to this Consortium Agreement that neither Party shall assign or delegate or subcontract its rights, duties or obligations under this

Agreement to any person or entity except with prior written consent of [WBSEDCL].

14. This Consortium Agreement:
a) has been duly executed and delivered on behalf of each Party hereto and constitutes the legal, valid, binding and enforceable obligation of each such Party;
b) sets forth the entire understanding of the Parties hereto with respect to the subject matter hereof; and
c) may not be amended or modified except in writing signed by each of the Parties and with prior written consent of WBSEDCL.

IN WITNESS WHEREOF, the Parties to the Consortium Agreement have, through WBSEDCL, executed these presents and affixed common seals of their respective companies on the Day, Month and Year first mentioned above.

1.CommonSealof.....	For M/s.....(Party1)
Has been affixed in my/ our presence	*[Signature of Authorized Representative]*
Pursuant to Board Resolution dated.....	.....
	[Name of the Authorized Representative]
	[Designation of the Authorized Representative]
1.1. Witness1	1.2. Witness2
[Signature of Witness 1]	[Signature of Witness 1]
.....	.....
Name:	Name:
Designation:	Designation:
2.CommonSealof.....	For M/s.....(Party2)
has been affixed in my/ our	*[Signature of Authorized Representative]*
presence pursuant to Board	.....
Resolution dated	*[Name of the Authorized Representative]*
	[Designation of the Authorized Representative]
2.1. Witness1	2.2. Witness2
[Signature of Witness 1]	[Signature of Witness 1]
.....	.....
Name:	
Designation:	Name:
	Designation

3.Common Seal of.....
has been affixed in my/ our
presence pursuant to Board
Resolution dated
.....

3.1. Witness1
[Signature of Witness 1]
.....
Name:
Designation:

For M/s.....(Party3)
[Signature of Authorized Representative]
.....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]
3.2. Witness2
[Signature of Witness 1]
.....
Name:
Designation:

Role and Responsibility of each Member of the Consortium:

1. Roles and Responsibilities of the Party 1 (Lead Consortium Member):
2. Roles and Responsibilities of the Party 2
3. Roles and Responsibilities of the Party 3.

ANNEXURE-IV: Format of Power of Attorney by Consortium Member in favour of Lead Consortium Member

[To be provided by each Consortium Member (other than the Lead Consortium Member) in favour of the Lead Consortium Member]

WHEREAS WBSEDCL has issued for Tender No. …….. (the "RFP") dated…….
For inviting Bids in respect of Appointment of AMI Implementing Agency for Implementation of AMI Project (the "Project") on the terms contained in the RFP;

WHEREASM/s……., M/s……., M/s. and M/s..... [*Insert names of all Members of Consortium*] the Members of the Consortium are desirous of submitting a Bid in response to the RFP, and if selected, undertaking the responsibility of implementing the Project as per the terms of the RFP;

WHEREAS all the Members of the Consortium have agreed under the Consortium Agreement dated (the "Consortium Agreement"), entered into between all the Members and submitted along with the Bid to appoint…….. [*Insert the name and address of the Lead Consortium Member*] as Lead Consortium Member to represent all the Members of the Consortium for all matters regarding the RFP and the Bid;

AND WHEREAS pursuant to the terms of the RFP and the Consortium Agreement, we, theMembersoftheConsortiumherebydesignateM/s……..*[Insertnameofthe LeadMember]* as the Lead Consortium Member to represent us in all matters regarding the Bid and the RFP, in the manner stated below:

Know all men by these presents, we ..... [*Insert name and Address of the registered office of the Member1*],……
[*Insert name and address of the registered office of theMember2*],……..
[Insert name and address of the registered office of the Member] do here by constitute, appoint, nominate and authorize……..
[Insert name and registered office address of the Lead Consortium Member], which is one of the Members of the Consortium, to act as the Lead Member and our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of Consortium's Bid in response to the Tender issued by WBSEDCL including signing and submission of the Bid and all documents related to the Bid as specified in the Tender, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document, which WBSEDCL may require us to submit. The aforesaid attorney is further authorized for making representations to WBSEDCL named in the Bid, and providing information/responses to WBSEDCL,
representing us and the Consortium in all matters before WBSEDCL named in the Tender, and generally dealing with WBSEDCL named in the Tender in all matters in connection with our Bid, till completion of the bidding process as well as implementation of the Project, if applicable, in accordance with the Tender document.

We, as Members of the Consortium, hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things

done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFP.

We, as Members of the Consortium, hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFP.

Signed by the within named…… *[Insert the name of the executant Consortium Member]* **through the hand of** Mr./Ms./ Dr.……..
Duly authorized by the Board to issue such Power of Attorney dated this……..
Day of……

Accepted
…… (Signature of Attorney)
[Insert Name, designation and address of the Attorney] **Attested**
……..(Signature of the executant)
(Name, designation and address of the executant)
……
Signature and stamp of Notary of the place of execution

Common seal of …… has been affixed in my/our presence pursuant to Board of Director's Resolution dated……..

WITNESS:
1. (Signature)
Name……..
Designation……..
2. (Signature)
Name……..
Designation……..

Notes

a. The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s).

b. In the event, power of attorney has been executed outside India, the same needs to be duly notarized by a notary public of the jurisdiction where it is executed.

c. Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a Board resolution/power of attorney, in favour of the person executing this power of attorney for delegation of power here under on behalf of the executant(s).

ANNEXURE-V: Format of Power of Attorney by Lead Consortium Member authorizing an Individual Designated Representative for the Consortium

[To be on non-judicial stamp paper of Rupees One Hundred Only (INR 100/-) or appropriate value as per Stamp Act relevant to place of execution. Foreign companies submitting Bids are required to follow the applicable law in their country]

Know all men by these presents, we ..... *[Insert name and Address of the registered office of the Lead Consortium Member of the Bidding Consortium]*
Do here by constitute, appoint, nominate and authorize Mr./Ms…… *[Insert name and residential address]*, who is presently employed with us and holding the position of our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid in response to Tender No.[Tender Details] for Appointment of SI/ Implementation Agency for Implementation of MDMS Project (the "Project") issued by WBSEDCL, including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which WBSEDCL may require us to submit. The aforesaid attorney is further authorized for making representations to WBSEDCL, and providing information / responses to WBSEDCL, representing us in all matters before WBSEDCL, and generally dealing with WBSEDCL in all matters in connection with our Bid till the completion of the bidding process as per the terms of the RFP.

We here by agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.
All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFP.

Signed by the within named…….*[Insert the name of the executant company]* **through the hand of Mr./Mrs. ……Duly authorized by the Board to issue such Power of Attorney dated this ……day of……Accepted**

…… (Signature of Attorney)
[Insert Name, designation and address of the Attorney]
Attested

……..
(Signature of the executant)
(Name, designation and address of the executant)

……..
Signature and stamp of Notary of the place of execution

Common seal of ……. has been affixed in my/our presence pursuant to Board of Director's Resolution dated……

WITNESS:

1. (Signature)
Name……..
Designation……..
2. (Signature)
Name……..
Designation……..

Notes:

a. The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s).

b. In the event, power of attorney has been executed outside India, the same needs to be duly notarized by a notary public of the jurisdiction where it is executed.

c. Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).

ANNEXURE-VI: Format of Letter of Consent by Consortium Member reviewing each element of the Bid

[On the letter head of each Member of the Consortium including Lead Member]
[Reference No.]

From:
[Address of the Lead Consortium
Member] [Telephone No., Fax No.,
Email]
[Date]

To:
WBSEDCL
Vidyut Bhavan, Block-DJ,
Sector -II Bidhannagar,
Kolkata-91

Sub: Bid for Smart Meter with Communication System and Head End System for AMI Solution in TOTEX Model.
Ref:……[Tender Details]
Dear Sir/Madam,

We, ……*[Insert name of the undersigned Consortium Member]* Member of Consortium Lead by .*[Insert name of the Lead Consortium Member]* have read, examined and understood the RFP and RFP Documents for Appointment of Implementing Agency for Implementation of Smart Meter with Communication System and Head End System for AMI Solution in TOTEX Model.

We hereby confirm our concurrence with the RFP including in particular the Consortium Agreement and the Bid submitted by …….. [*Insert name of the Lead Consortium Member*], in response to the RFP. We confirm that the Bid has been reviewed and each element of the Bid is agreed to including but not limited to the commitment and obligations of our Company.

The details of contact person are furnished as under:

Name:
Designation:
Name of the Company:
Address:
Phone Nos.:
Fax Nos.:
E-mail address:
Dated the ……. day of……. of 20……
Thanking you,
Yours faithfully,

……..
[Signature, Name, Designation of Authorized Signatory of Consortium Member and Company's Seal]

Business Address:
[Name and address of principal officer]

ANNEXURE-VII: BID PROPOSAL

From

Bidder's Name and Address	:
Contact person	:
Designation	:
Telephone No. (Land Line & mobile)	:
Fax	:
Tender Reference	:

To
The Chief Engineer,
IT & C Cell,
West Bengal State Electricity Distribution Company Limited,
3rd Floor, Block- 'D', Vidyut Bhavan.,
Bidhannagar,
Kolkata- 700 09l.

Sub.: Invitation to Supply, Installation & Maintenance of Smart Meter with Communication System, Head End System (HES) and Meter Data Management System (MDMS) for AMI Solution in TOTEX Model.

Dear Sir,

1. We the undersigned Bidder/(s), having read and examined in details the specifications and other documents of the subject Tender, do hereby propose to execute the contract as per specification as set forth in your Bid-Document.

2. PRICES AND VALIDITY:
   2.1 The ex-works prices of all items/equipment and rate of erection, commissioning etc. stated in the bid are FIRM during the entire period of contract irrespective of date of completion and not subject to any price adjustment as per in line with the Bidding Documents. All prices and other terms and conditions of this proposal are valid for a period of 180 (one hundred eighty) days from the date of opening of the bids (Part-1). We further declare that prices stated in our proposal are in accordance with your bidding.

   2.2 We confirm that our bid prices include all other taxes and duties and levies applicable on bought out components, materials, equipment's and other items and confirm that any such taxes, duties and levies additionally payable shall be to our account.

   2.3 All duties & taxes such, if any, applicable on transaction from us to you payable extra by you against production of documentary evidence to be submitted by us.

III. BID GUARANTEE:
We have enclosed a Bid Guarantee in the form of Bank Guarantee from

…… drawn in favour of WBSEDCL for an amount of Rs.....

IV. DEVIATIONS:

We declare that contract shall be executed strictly in accordance with the specifications and documents except for the deviations, all of which have been detailed out exhaustively in our deviation schedules, in volume irrespective of whatever has been stated to the contrary anywhere else in our proposal.

Further, we agree that additional conditions, deviations, if any, found in the proposal documents other than those stated in our Deviation Schedules, save that pertaining to any rebates offered, shall not be given effect to.

V. WORK SCHEDULE:

If this proposal is accepted by you, we agree to provide services and complete the entire work, in accordance with schedule indicated in the proposal, we fully understand that the work completion schedule stipulated in the proposal is the essence of the Contract, if awarded. The completion schedule of the various major key phases of the work will be as per time Schedule submitted by us and approved by WBSEDCL in order to maintain the completion time schedule of bid documents.

VI. CONTRACT PERFORMANCE GUARANTEE:

We further agree that if our proposal is accepted, we shall provide a Contract Performance Guarantee of value, equivalent to ten percent (10%) of the Contract Price as stipulated in Bid document in the form of Bank Guarantee (Please specify the form of guarantee) in your favour and enter into a formal agreement with you within 15 (Fifteen) days from the date of placement of Letter of Award.

Dated.....this.....day of.....2023

Thanking you, we remain,

Yours faithfully,

Date _____

Place _____ (Signature) _____

(Printed Name) _____

(Designation) _____

(Common Seal) _____

Business Address:
Name & Address of Authorized Signatory

ANNEXURE-VIII: PROFORMA OF BANK GUARANTEE
FOR BID GUARANTEE (Earnest Money)

(*To be stamped in accordance with Stamp Act*)

Ref. No.: Date:

To
The West Bengal State Electricity Distribution Company Limited
Vidyut Bhawan
DJ Block, Sector - II
Salt Lake, Kolkata - 700 091

Dear Sirs,

In accordance with your Notice Inviting Tender (NIT) under your Specification No._____ M/s _____ having its Registered Head Office at _____ (hereinafter called the Bidder) wish to participate in the said Tender for _____.

As an irrevocable Bank Guarantee against Bid Guarantee for an amount of ____ is required to be submitted by the Bidder as a condition precedent for participation in the said Tender, which amount is liable to be forfeited on the happening of any contingencies mentioned in the Tender Documents.

We, the _____ Bank at _____ having our Head Office at _____ (Address of Bank) guarantee and undertake to pay immediately on demand by West Bengal State Electricity Distribution Company Limited the amount of _____ (in words and figures) without any reservation, protest, demur and recourse. Any such demand made by said Purchaser shall be conclusive and binding on us irrespective of any dispute of difference raised by the Bidder.

This Guarantee shall be irrevocable and shall remain valid up to **_____. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instructions from M/s _____ on whose behalf this Guarantee is issued.

All rights of West Bengal State Electricity Distribution Company Limited under this Guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities there under unless WBSEDCL enforce a claim under this Guarantee against the Bank within three months from the above-mentioned expiry date of validity or, from that of the extended date.

In witness whereof the Bank, through its authorized Officer, has set its hand and stamp on this _____ day of _____ 2023 ___ at _____.

WITNESS:

_____ _____
(Signature) (Signature)

_____ _____

(Name) (Name)

_____ _____

(Official address) (Designation with Bank Stamp)

Attorney as per Power of Attorney No. _____

Date _____

** This date should be initially for one hundred eighty (180) days and may be extended from time to time.

ANNEXURE-IX: Data Requirement Sheet: Technical and functional particulars

(A) Three-phase CT operated smart meter:

TS.1. Technical Specification for AC 3 Phase 4 Wire Solid State (Static) Import/ Net (Import - Export) Smart Energy Meter of voltage levels 132KV, 33 KV, 11KV and LT CT operated 3x240V

1.0 SCOPE

This scope covers design, engineering, manufacture, testing, inspection and supply of AC 3 Phase 4 Wire Solid State (Static) Import /Net (Import/Net (Import-Export) Smart Energy Meter with backlit LCD display used for balanced/unbalanced load. The Smart Meter shall be capable of recording and displaying energy in MWh /KWh & demand in MVA / KVA as the case may be, in all four quadrants, Smart Meter shall have facility / capability of recording tamper information & load survey of active energy (both Import/Net (Import - Export), apparent energy, reactive energy, phase currents, phase voltages & other parameters in non-volatile memory.

It is not the intent to specify completely herein all the details of the design and construction of Smart Meter. However, the Smart Meter shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing commercial operation continuously in a manner acceptable to WBSEDCL, who will interpret the meanings of drawings & specification and shall have the right to reject any work or material which in its judgment is not in accordance herewith. The Smart Meter shall be complete with all components, accessories necessary for their effective and trouble-free operation for the purpose mentioned above. Such components shall be deemed to be within the scope of bidder's supply irrespective of whether those are specifically mentioned or not in this specification or in the commercial order.

2.0 STANDARDS APPLICABLE

Unless specified elsewhere in this specification, the performance & testing of the Smart Meters shall conform to the following Indian / International standards, to be read with up-to-date and latest amendments / revisions there of as on 90 days prior to floating of tender.

Sl. No.	Standard No.	Title
1	IS 14697 (1999)	AC Static Transformer Operated Watt hour and VA -hour Meters
2	**IEC 62053-22 with latest amendments**	Electricity Metering Equipment (A.C.) - Particular Requirements - Part 22: Static Meters for Active Energy (Classes 0.2S and 0.5S)

3	CBIP Report No. 325 along with its latest amendments, if any	Specification for AC Static Electrical Energy Meters
4	IS 16444 Part II (Smart Features)	Specification for AC Static Transformer Operated Watt hour And Var-Hour **Smart** Meters, Class 0.2s, 0.5s
5	IS 11731 (Part-I)	Specification of material of terminal block.
6	ISO 75-1&2 (1993)	Specification of temperature test of materials.
7	IS 12346 :1988	Specification for testing equipment for AC Static Electrical Energy Meter (latest amendment)
8	**IS 9000**	Basic Environmental Testing Procedures for Electronic & electrical Items
9	IS-15959: (DLMS) with latest amendment	Data Exchange for Electricity Meter Reading Tariff & Load Control - Companion Specification

3.0 CLIMATIC CONDITIONS

The Smart Meters to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

3.1 Maximum Ambient Air Temperature in shade: 55^0 C

3.2 Minimum Ambient Air Temperature: (-)10^0 C

3.3 Maximum Relative Humidity: 95% (non-condensing)

3.4 Minimum Relative Humidity: 10%

3.5 Maximum altitude above mean sea level (MSL): 3000 m

3.6 Average number of tropical monsoons per annum: 5 months

3.7 Annual Rainfall: 100 mm to 1500 mm

3.8 Maximum Wind Pressure: 150 Kg/Sqm

Smart Meters shall be capable of maintaining required accuracy under hot, tropical and dusty climatic conditions. The Smart Meters shall be suitably designed and treated for normal life and satisfactory operation under hot and hazardous tropical climatic conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish which provides suitable protection to them from any injurious effect of excessive humidity.

4.0 ELECTRICAL SPECIFICATIONS

Description	132 KV	33 KV	11 KV	LT CT operated
Class of Accuracy	0.2S	0.5S	0.5S	0.5S
Type of Smart Meter	3 Phase 4 Wire			
PT Ratio	(132/√3) kV / (110/√3) V	(33/√3) kV / (110/√3) V	(11/√3) kV / (110/√3) V	240V / 240 V LT
Rated PT secondary voltage (V_{ref})	110 V (P-P), 110/√3 V (P-N) with variation -30% to +20%			415(P-P), 240 V(P-N) variation -30% to +20%

CT Ratio	200/1A	100/1A	50/5 A	200/5 A
Rated Current (I_b)	1A	1A	5A	5A
Maximum Current (I_{max})	2A	2A	10A	10A
Starting Current	0.1% of I_b at upf			
Rated Frequency	50 Hz ±5%			
Power Factor Range	From Zero lagging through Unity to Zero leading. In Import mode Smart Meter shall be lag only. (Programmable) From Zero lagging to Unity to Zero leading. In Export mode Smart Meter shall be lag only / lag + lead (Programmable)			
Power Loss	Voltage Circuit: <= 1.5W/10VA Current Circuit: <= 1VA			
Resistance to surge voltage of 1.2/50 µSec	8kV peak (minimum)			
Test Voltage at 50 Hz for 1 min	2kV rms			
Clock Time Accuracy	Maximum ±2 min drift per annum	Maximum ±5 min drift per annum		

5.0 TEMPERATURE RISE

IS 14697 as well as 16444 Part II shall have to be followed to ascertain that under normal condition of use, winding and insulation shall not reach a temperature, which might adversely affect the operation of the Smart Meters.

6.0 ACCURACY

Class of accuracy of the meter shall be as per above table (**Clause No:4.0**)

Limits of error should be in line with IS-14697/16444 Part II.

There shall be no drift in accuracy at least for a period of ten years from the date of supply. In case any drift is noticed which is beyond the permissible limits, the Smart Meter has to be recalibrated / replaced by a new one by the supplier.

7.0 RUNNING AT NO LOAD

Running at no load: When 70% & 120% voltage is applied and no current flows in the current circuit, the test output of the Smart Meter shall not produce more than one pulse.

8.0 CONSTRUCTION

8.1 The case, winding, voltage circuit, sealing arrangements, registers, terminal block, terminal cover & name plate etc. shall be in accordance with the relevant standards. The Smart Meter shall be compact & reliable in design, easy to transport & immune to vibration & shock involved in the transportation & handling. The construction of the Smart Meter shall ensure consistence performance under all conditions especially during heavy rains / very hot weathers. The insulating materials used in the Smart Meter shall be non-hygroscopic, non-ageing & have tested quality. The Smart Meter shall be sealed in such a way that the internal parts of the Smart Meter become inaccessible and attempts to open the Smart Meter shall result in viable damage to the Smart Meter

cover i.e. break to open type. This is to be achieved by using continuous Ultrasonic welding on all the four sides of the Smart Meter base and cover or any other technology which is either equally or more efficacious.

8.2 The Smart Meter shall comply latest technology such as Microcircuit or Application Specific Integrated Circuit (ASIC) to ensure reliable performance. The mounting of the components on the PCB shall compulsorily be Surface Mounted Technology (SMT) type. Power supply component may be of PTH type. The electronic components used in the Smart Meter shall be of high quality and there shall be no drift in the accuracy of the Smart Meter for at least ten years. The circuitry of the Smart Meter shall be compatible with 16 Bit (or better) ASIC with compatible processor and Smart Meter shall be based on Digital measuring and sampling technique.

8.3 The Smart Meter shall be housed in a safe, high grade, unbreakable, fire resistant, UV stabilized, virgin Polycarbonate casing of projection mounting type. The Smart Meter cover shall be transparent / translucent/ opaque. But the viewing portion shall be transparent for easy reading of displayed parameters, and observation of operation indicators. The Smart Meter base may not be transparent, but it shall not be black in colour. The Smart Meter casing shall not change in shape, colour, size and dimensions when subjected to 72hrs on UV test as per ASTMD 53. It shall withstand 650 deg.C. glow wire test and heat deflection test as per ISO 75 or as per IEC 60068 -2-5.

8.4 In addition to the above, the Smart Meter cover shall be sealable to the Smart Meter base with at least 2 nos. bar coded seals bearing the identification marks of the Manufacturer. Suitable arrangement shall be made for fitting/fixing of utility seal at two sides of Smart Meter terminal cover in such a manner that any access to the terminal cannot be made possible without removing the seal. There shall also be provision for sealing at the optical port & terminal cover.

8.5 The polycarbonate material of only the following manufacturers shall be used:

8.5.1 **G.E. Plastic:** LEXAN 943A or equivalent, like 943, 123R, 143 for Smart Meter cover
& terminal cover / LEXAN 503R or equivalent like 500, 143R, 500R for Smart Meter base and terminal block

8.5.2 **BAYER:** Grade corresponding to above

8.5.3 **DOW Chemical: --do--**

8.5.4 **MITSUBISHI: --do--**

8.5.5 **TEJIN: --do--**

8.5.6 **DUPONT: --do—**

8.6 SMART METER CASE AND COVER

8.6.1 In case, ultrasonic welding using plate / strip is used, the material of plate / strip shall be same as that of cover and base and the strip. The manufacturer's logo shall be embossed on the strip plate. The material of the Smart Meter body (case and cover) shall be of Engineering Plastic. Meter having seamless Chemical welding between base and cover with break-to-open feature may be accepted.

8.6.2 The Smart Meter cover shall be fixed to the Smart Meter base (case) with Unidirectional Screws, so that the same cannot be opened by use of screwdrivers. These unidirectional screws shall be covered with transparent caps (not required for screw less design), ultrasonically welded with the Smart Meter body and the screw covers shall be embedded in the Smart Meter body in a groove. The Smart Meter shall withstand external magnetic influence as per latest amendments of CBIP Technical Report No.325 including 0.2T AC Magnet, 0.5T Permanent magnet. Meter having screw-less design with Chemical welding between base and cover with break-to-open feature may also be accepted.

8.7 TERMINAL BLOCK AND COVER

8.7.1 The terminal Block, the terminal cover (if not of metal) and the case (if not of metal) shall be of a material which complies with the requirements of IS 11731 (Part-I) method FH 1. The material of which the terminal block is made shall be capable of passing the test given in ISO 75-1 (1993) and ISO 75-2 (1993) for a temperature of 135 °C and a pressure of 1.8 MPa (Method A). The terminal block shall accommodate a conductor having a cross-section at least equivalent to the main current conductors but which a lower limit of $6mm^2$ and shall be clearly identified by earthing symbol.

8.7.2 The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block shall be made from best quality non- hygroscopic, flame retardant material (capable of passing the flammability tests) with nickel plated brass inserts / alloy inserts for connecting terminals. It shall be rigidly fixed to the base of the Smart Meter so that it cannot be separated from the Smart Meter base without breaking either the Smart Meter base or the terminal block and this fixing arrangement shall be in parallel to the Smart Meter base in such a way that it cannot be viewed or approached from any part of the Smart Meter without breaking the Smart Meter.

8.7.3 The terminals in the terminal block shall be of adequate length in order to have proper grip of conductor. The screws shall have thread size not less than M4 and head having 6 mm (M6 terminal screws having 5.5 mm head diameter shall also be accepted). Diameters. The screws shall not have pointed ends at the end of threads. All terminals and connecting screws and washers shall be of tinned / nickel plated brass material. The terminal block shall withstand glow wire test at 960 + 15 ºC and the terminal shall withstand at least 135 ºC. as per IS.

8.7.4 The internal diameter of terminal hole shall be minimum 5.5 mm and center to center distance is 13 mm. The holes in the insulating material shall be of sufficient size to accommodate the insulation of conductor also.

8.7.5 The terminal cover shall be transparent re-enforced Polycarbonate, Engineering Plastic with minimum thickness 2.0 mm and the terminal cover shall be of extended type completely covering the terminal block and fixing holes. The space inside the

terminal cover shall be sufficient to accommodate adequate length of external cables.

9.0 MARKING OF THE SMART METER

Every Smart Meter shall have a nameplate clearly visible, indelible and distinctly marked in accordance with relevant Standards. The following information shall appear on an external plate attached to the Smart Meter cover (Rating plate information using laser marking on meter case shall also be accepted):

9.1 Manufacturer's name or trade mark & place of manufacture
9.2 Designation of type
9.3 Number of phases & wires
9.4 Serial number of Smart Meter
9.5 Device ID (as per Table 4 of IS 15959 part 3)
9.6 Month & year of manufacture
9.7 Principal unit(s) of measurement
9.8 PT Ratio
9.9 Basic current and rated maximum current
9.10 CT Ratio
9.11 Reference frequency in Hz
9.12 Smart Meter Constant (Impulse/MWh or KWh)
9.13 Class index of Smart Meter
9.14 Reference temperature
9.15 -Property of WBSEDCL
9.16 Purchase Order No. & Date
9.17 Guarantee (Guaranteed for a period of 5 ½ years from the date of supply)
9.18 BIS marking
9.19 The sign of Double Square for insulating encased Smart Meters
9.20 Barcode/QR Code for Smart Meter serial no. in alpha numeric form, date of manufacture, current rating of the Smart Meter and PO reference, readable by single layer barcode reader
9.21 Firmware version

10.0 CONNECTION DIAGRAM AND TERMINAL MARKING

Every Smart Meter shall be indelibly marked with a diagram of connection. For this poly phase Smart Meters, this diagram shall also show the phase sequence for which the Smart Meter is intended. It is permissible to indicate the connection diagram by an identification figure in accordance with relevant standards. The marking of Smart Meter terminals shall appear on this diagram.

11.0 DISPLAY OF MEASURED VALUES

11.1 The Smart Meter shall have alphanumeric display with at least 7 full digits with LCD backlit display, having minimum character height of 10 mm. The data shall be stored in nonvolatile

memory. The non-volatile memory shall retain data for a period of not less than 10 years under unpowered condition. Battery back-up memory will not be considered as NVM.

11.2 It shall be possible to easily identify the single or multiple displayed parameters through symbols /legend on the Smart Meter display itself or through display annunciation which shall be self-explanatory and symmetric.

11.3 In addition to provide Serial Number of the Smart Meter on the display plate, the Smart Meter serial no. shall also be programmed into Smart Meter memory for identification through communication port for laptop / Smart Meter reading printout.

11.4 Visibility of display in poor light conditions is an important criterion. STN or TN or any better type of advanced LCD to be used. Proper legends for the displayed parameters to be provided (Factory programmable). Back lit provided for clear visibility shall be uniform throughout all part of the LCD.

11.5 The Smart Meters shall have auto-display mode for pre-selected parameters. Push-Button mode of display shall display all parameters and it shall have priority over auto mode. The Smart Meter shall give clear message on display to indicate that the Smart Meter has experienced tampers and the nature of tamper with date and time of first occurrence, last occurrence and last restoration.

11.6 Connection check, Phase sequence and self-diagnostic shall give clear message on display. The Smart Meter shall have a test output **(**blinking **LED)** accessible from the front and be capable of being monitored with suitable testing equipment. The operation indicator must be visible from the front. Test output device shall be provided in the form of Two separate LED for active and reactive energy with the provision of selecting the parameter being tested (separate LED may also be used with proper distance).

12.0 DISPLAY SEQUENCE (For 11 KV, 33 KV & 132 KV meters)

The Smart Meter shall display the required parameters in two different modes as follows. Display sequence for both auto and Push button must be maintained, no interchange in sequence or display parameter will be accepted. All the display shall have proper legend to identify the same. All the display parameters like auto and push will come under push method. <u>The display logic and parameters as followed are provisional</u> and subject to change after sample testing/firm order. The provision for necessary alteration of display parameters may be made available by the respective manufacturer.

12.1 Auto Display Mode: In this mode, the below listed parameters shall be displayed in the following sequence:

12.1.1 LCD Test
12.1.2 Smart Meter Serial Number
12.1.3 Real Time & Date (DD/MM/YYYY)
12.1.4 Rising Apparent Demand with elapsed time while Active Import
12.1.5 Rising Apparent Demand with elapsed time while Active Export

12.1.6 No. of Power Failures
12.1.7 Cumulative Active Import Energy (Cumulative sign/legend must be given)
12.1.8 Cumulative Active Export Energy
12.1.9 Cumulative Reactive Energy – Quadrant-I
12.1.10 Cumulative Reactive Energy – Quadrant-II
12.1.11 Cumulative Reactive Energy – Quadrant-III
12.1.12 Cumulative Reactive Energy – Quadrant-IV
12.1.13 Cumulative Apparent Forward Energy (Active Import)
12.1.14 Cumulative Apparent Forward Energy (Active Export)
12.1.15 Apparent Forward Maximum Demand (Active Import)
12.1.16 Apparent Forward Maximum Demand (Active Export)
12.1.17 Inst. Voltages – Phase-wise (P-N)
12.1.18 Inst. Currents – Phase-wise
12.1.19 Signed Inst. Power Factor – Phase-wise
12.1.20 Inst. Net Power Factor
12.1.21 Inst. Apparent Power
12.1.22 Signed Active Power in MW
12.1.23 Signed Reactive Power in MVAR
12.1.24 Frequency
12.1.25 Cumulative Billing Count
12.1.26 Cumulative Tamper Count
12.1.27 Cumulative Power Off Hours since manufacturing
12.1.28 Power **OFF** Hours of present month
12.1.29 Phase Sequence of Voltage & Current
12.1.30 Connection Check
12.1.31 Self-Diagnosis
12.1.32 Cumulative Net Active Forward Import Energy
12.1.33 Cumulative Net Active Forward Export Energy

12.2 Push Button mode: Over & above the parameters of Auto Display Mode, the following parameters shall be displayed on pressing the push button. The Smart Meter display shall return to auto display mode (mentioned above) if the 'push button' is not operated approx. more than 6 seconds.

Import Mode

12.2.1 LCD Test
12.2.2 Smart Meter Serial Number
12.2.3 Real Time & Date (DD/MM/YYYY)
12.2.4 Rising Apparent Demand with elapsed time while Active Import
12.2.5 No. of Power Failures
12.2.6 Cumulative Active Import Energy (Cumulative sign/legend must be given)
12.2.7 Cumulative Reactive Energy – Quadrant-I
12.2.8 Cumulative Reactive Energy – Quadrant-II
12.2.9 Cumulative Reactive Energy – Quadrant-III

12.2.10 Cumulative Reactive Energy – Quadrant-IV
12.2.11 Cumulative Apparent Forward Energy (Import)
12.2.12 Apparent Forward Maximum Demand (Import) With Date & Time
12.2.13 Active Maximum Demand (Import) with date & time
12.2.14 TOD wise Cumulative Active Import Energy
12.2.15 TOD wise Cumulative Apparent Import Energy
12.2.16 TOD wise Apparent Forward Maximum Demand (Import)
12.2.17 TOD wise Active Forward Maximum Demand (Import)
12.2.18 Cumulative Apparent MD (Import)
12.2.19 Cumulative Billing Count
12.2.20 Inst. Secondary Voltages – Phase-wise
12.2.21 Inst. Secondary Currents – Phase-wise
12.2.22 Signed Inst. Power Factor – Phase-wise
12.2.23 Inst. Net Power Factor
12.2.24 Inst. Apparent Power in MVA
12.2.25 Frequency
12.2.26 Signed Active Power in MW
12.2.27 Signed Reactive Power in MVAR
12.2.28 Cumulative Tamper Count
12.2.29 Cumulative Power Off Hours since manufacturing
12.2.30 Power **OFF** Hours of present month
12.2.31 Phase Sequence & Phase Correspondences of Voltage & Current
12.2.32 Connection Check
12.2.33 Self-Diagnosis
12.2.34 History 1 Cumulative Active Forward Import Energy
12.2.35 History 1 Cumulative Apparent Forward Import Energy
12.2.36 History 1 Apparent MD while Active Import with Date & Time
12.2.37 Last Billing Date & Time
12.2.38 History 1 Average Power Factor
12.2.39 Battery Status
12.2.40 Present Tamper Status (PT/CT/Other)
12.2.41 First Tamper Occurrence with Date & Time
12.2.42 Last Tamper Occurrence with Date & Time
12.2.43 Last Tamper Restoration with Date & Time
12.2.44 Cover Open Information with Date & Time
12.2.45 High Resolution Cumulative Forward Active Energy (Import) (2+5 in MWh)
12.2.46 High Resolution Cumulative Forward Reactive Energy – Quadrant-(Q1-Q3) (2+5 in MVArh)
12.2.47 High Resolution Cumulative Forward Reactive Energy – Quadrant-(Q2-Q4) (2+5 in MVArh)
12.2.48 High Resolution Cumulative Forward Apparent Energy (Import) (2+5 in MVAh)
12.2.49 Present Voltage THD
12.2.50 Present Current TDD (Current THD shall be accepted)
12.2.51 Maximum Voltage THD with date & time
12.2.52 Maximum Current TDD with date & time (Maximum Current THD shall be

accepted)

12.3 Net (Import-Export)

12.3.1 LCD Test
12.3.2 Smart Meter Serial Number
12.3.3 Real Time & Date (DD/MM/YYYY)
12.3.4 Rising Apparent Demand with elapsed time while Active Import
12.3.5 Rising Apparent Demand with elapsed time while Active Export
12.3.6 No. of Power Failures
12.3.7 Cumulative Active Import Energy
12.3.8 Cumulative Active Export Energy
12.3.9 Cumulative Reactive Energy – Quadrant-I
12.3.10 Cumulative Reactive Energy – Quadrant-II
12.3.11 Cumulative Reactive Energy – Quadrant-III
12.3.12 Cumulative Reactive Energy – Quadrant-IV
12.3.13 Cumulative Apparent Forward Energy (Active Import)
12.3.14 Cumulative Apparent Forward Energy (Active Export)
12.3.15 Apparent Maximum Demand (Import) with date & time
12.3.16 Apparent Maximum Demand (Export) with date & time
12.3.17 Active Maximum Demand (Import) with date & time
12.3.18 Active Maximum Demand (Export) with date & time
12.3.19 TOD wise Cumulative Active Import Energy
12.3.20 TOD wise Cumulative Apparent Import Energy
12.3.21 TOD wise Apparent Forward Maximum Demand (Import)
12.3.22 TOD wise Cumulative Active Export Energy
12.3.23 TOD wise Cumulative Apparent Export Energy
12.3.24 TOD wise Apparent Forward Maximum Demand (Export)
12.3.25 Cumulative Apparent MD (Import)
12.3.26 Cumulative Apparent MD (Export)
12.3.27 Cumulative Billing Count
12.3.28 Inst. Secondary Voltages – Phase-wise (P-N)
12.3.29 Inst. Secondary Currents – Phase-wise
12.3.30 Signed Inst. Power Factor – Phase-wise
12.3.31 Inst. Net Power Factor
12.3.32 Inst. Apparent Power
12.3.33 Signed Active Power in MW
12.3.34 Signed Reactive Power in MVAR
12.3.35 Frequency
12.3.36 Cumulative Tamper Count
12.3.37 Cumulative Power Off Hours since manufacturing
12.3.38 Power **OFF** Hours of present month
12.3.39 Phase Sequence & Phase Correspondences of Voltage & Current
12.3.40 Connection Check
12.3.41 Self-Diagnosis

12.3.42 Cumulative Net Active Forward Import Energy
12.3.43 Cumulative Net Active Forward Export Energy
12.3.44 History 1 Cumulative Active Forward Import Energy
12.3.45 History 1 Cumulative Active Forward Export Energy
12.3.46 History 1 Cumulative Apparent Forward Import Energy
12.3.47 History 1 Cumulative Apparent Forward Export Energy
12.3.48 History 1 Apparent MD while Active Import with Date & Time
12.3.49 History 1 Apparent MD while Active Export with Date & Time
12.3.50 Last Billing Date & Time
12.3.51 History 1 Average Power Factor
12.3.52 Battery Status
12.3.53 Present Tamper Status (PT/CT/Other)
12.3.54 First Tamper Occurrence with Date & Time
12.3.55 Last Tamper Occurrence with Date & Time
12.3.56 Last Tamper Restoration with Date & Time
12.3.57 Cover Open Information with Date & Time
12.3.58 High Resolution Cumulative Forward Active Energy (Import) (2+5 in MWh)
12.3.59 High Resolution Cumulative Forward Active Energy (Export) (2+5 in MWh)
12.3.60 High Resolution Cumulative Forward Reactive Energy – Quadrant-I (2+5 in MVArh)
12.3.61 High Resolution Cumulative Forward Reactive Energy – Quadrant-II (2+5 in MVArh)
12.3.62 High Resolution Cumulative Forward Reactive Energy – Quadrant-III (2+5 in MVArh)
12.3.63 High Resolution Cumulative Forward Reactive Energy – Quadrant-IV (2+5 in MVArh)
12.3.64 High Resolution Cumulative Forward Apparent Energy (Import) (2+5 in MVAh)
12.3.65 High Resolution Cumulative Forward Apparent Energy (Export) (2+5 in MVAh)
12.3.66 Present Voltage THD
12.3.67 Present Current TDD (Current THD shall be accepted)
12.3.68 Maximum Voltage THD with date & time
12.3.69 Maximum Current TDD with date & time (Maximum Current THD shall be accepted)

12.4. TOD Wise

12.4.1 TOD wise Cumulative Active Forward Energy (Import)
12.4.2 TOD wise Cumulative Active Forward Energy (Export)
12.4.3 TOD wise Cumulative Apparent Forward Energy (Import)
12.4.4 TOD wise Cumulative Apparent Forward Energy (Export)
12.4.5 TOD wise Apparent MD (Import) with Date & Time
12.4.6 TOD wise Apparent MD (Export) with Date & Time
12.4.7 TOD wise History 1 Cumulative Active Forward Energy (Import)
12.4.8 TOD wise History 1 Cumulative Active Forward Energy (Export)
12.4.9 TOD wise History 1 Cumulative Apparent Forward Energy (Import)
12.4.10 TOD wise History 1 Cumulative Apparent Forward Energy (Export)
12.4.11 TOD wise History 1 Apparent MD (Import) with Date & Time

12.4.12 TOD wise History 1 Apparent MD (Export) with Date & Time

13.0 POWER OFF MODE DISPLAY

The following parameters shall be displayed in Power OFF mode:

13.1 Smart Meter Serial No.
13.2 Real Date &Time
13.3 History 1 Cumulative Active Forward Energy (Import)
13.4 History 1 Cumulative Active Forward Energy (Export)
13.5 History 1 Cumulative Apparent Forward Energy (Import)
13.6 History 1 Cumulative Apparent Forward Energy (Export)
13.7 History 1 Apparent MD while Active Import
13.8 History 1 Apparent MD while Active Export
13.9 Cumulative Billing Count
13.10 Cumulative Tamper Count
13.11 Cumulative Active Import Energy
13.12 Cumulative Active Export Energy

14.0 DISPLAY: OTHER REQUIREMENTS.

14.1 List of parameters for Auto, Push Button & Power OFF mode must have the following headers:
- 14.1.1 Auto Display Mode
- 14.1.2 Push Button Mode
- 14.1.3 Power OFF Mode

14.2 Each parameter shall be on Smart Meter display for 10 second the time gap between two auto display cycles shall be 15 sec. instead of 30 sec.

14.3 The register shall be able to record and display starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor. The register shall not roll over in between this duration.

14.4 Push button mechanism shall be of high quality and shall provide trouble free service for a long span of time.

14.5 Up and Down scrolling facility shall be there for Push Button Mode.

15.0 ANTI TAMPER FEATURES

The Smart Meter shall have the following anti-tamper features:

15.1 The Smart Meter shall be capable of recording energy correctly at Import as well as Export mode. If any phase current flows in forward direction, the Smart Meter shall register energy in phase-wise Import counter and if phase current flows in reverse direction, it shall register energy in Export counter.

Simultaneous Import/Net (Import – Export) in different phases shall be allowed and this will not be treated as any Tamper event. **Net Register as per pre-dominance to be provided.**

15.2 The Smart Meter shall work correctly irrespective of phase sequence of supply. (There must be an indication in display & down loaded data).

15.3 The Smart Meter shall work correctly even in absence of neutral. For reference voltage

Vref between 70% to 120 %, accuracy must be maintained within permissible limits as per IS.

15.4 The registration shall not be affected more than + 4% if high frequency (55Hz to 100Hz) or low frequency (45Hz to 30 Hz) AC signal w.r.t. earth is applied to the Smart Meter neutral. Smart Meters which are immune or will maintain better accuracy, will be preferred.

15.5 The Smart Meter shall be immune to Electro Static Discharge or Sparks of 35 KV (approx..) induced by using frequency-generating devices having very high output voltage.

Tests in this respect will be conducted by using commonly available devices and during spark discharge test, spark will be applied directly at all vulnerable points of the Smart Meter for a period of 10 minutes (at an interval of 1minute (approx..) between two consecutive strokes) and Smart Meter shall maintain accuracy after the test under this condition. Accuracy will be checked during and after application of spark discharge Test. Smart Meter shall record correctly within the specified limits of errors. Beyond 35 KV the Smart Meter shall record tamper if not immune.

*****THD*****

- For any consumer crossing the threshold of THD occurrence and restoration with date and time is to be registered as Tamper Events. Manufacturer may have their own logic to implement this THD threshold limits breach by the Consumer.
- This THD threshold limits breach data should be available as Event data with time stamping. The meter shall record the total energy i.e. the sum of Fundamental Energy at 50 Hz and Harmonic Energy for active as well as reactive parts.
- Provision for displaying the THD and TDD (Total Demand Distortion) as a percentage (%) of voltage and load current (IL) respectively in each phase.
- THD and TDD limits due to harmonics should be strictly as per IEEE Standard 519-1992 and should be < 0.05 in each case., assuming (ISC/IL) <= 20 for TDD as per IEEE-519-1992.
- The breach in THD and TDD limits should be logged as an event and the meter should generate a flag whenever the threshold (user configurable) of 5% is exceeded.
- THD & TDD values should have 15 minutes Integration period in Load Survey. However, TDD is preferable. THD logging availability as Load Survey and Events shall be accepted.
- Accuracy of harmonics recording shall be as per meter accuracy class.
- The meter shall record and display total forwarded energy including forwarded Harmonic energy in following conditions.
  (This is special requirement of the WBSEDCL)
  (a) Voltage and current both in phase
  (b) Voltage and current both out phase
  (c) Voltage in phase and current out phase
  (d) Voltage out phase and current in phase
  Above tests shall be carried out at
  Ref. Voltage, 0.5 Imax and UPF with
  10% 5th harmonics in voltage and 40% 5th harmonics in current.
  In all above conditions, meter shall record total energy = 1.04 (± 0.005) times fundamental energy.

% Maximum THD & TDD with date and time since Last Reset should be made available Threshold Values of all above occurrence and restoration are attached herewith. Snapshot values of Phase Voltage, Phase Current & Phase wise Power Factor, Active Energy value during occurrence & restoration to be provided in all the above-

mentioned tamper conditions in BCS AND HES with date and time. (Event logging Snapshots shall be considered when the actual phenomenon occurred). The logging time for recording occurrence and restoration of all tamper events except Magnetic & Neutral Disturbance tamper, shall be 5 min. Magnetic tamper shall appear instantaneously, Neutral Disturbance within 3 min.

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15.6 The Smart Meter shall be capable of recording occurrence and restoration with date and time in respect to the following tamper events:

15.6.1 Power failure (Tamper count not to be increased) - as per tamper logic
15.6.2 Invalid Voltage- as per tamper logic
15.6.3 Missing Potential (phase wise) —as per tamper logic
15.6.4 High Voltage – as per tamper logic
15.6.5 Voltage Unbalance – as per tamper logic
15.6.6 CT Open- as per tamper logic
15.6.7 CT Bypass/ CT Short - as per tamper logic
15.6.8 CT Unbalance - as per tamper logic
15.6.9 Over Current - as per tamper logic
15.6.10 Neutral Disturbances (If it is logged) - as per tamper logic
15.6.11 Magnetic Disturbances - as per tamper logic

15.7 Threshold Values of all above occurrence and restoration are provided with in annexed tamper logic sheet.

15.8 The logging time for recording occurrence and restoration of all tamper events except magnetic & neutral disturbance tamper, shall be 5 minutes. Magnetic tamper shall appear instantaneously and neutral disturbance within 3 minutes. However, it shall be programmable.

15.9 Snapshot values of Phase Voltage, Phase Current & Phase wise Power Factor, Active Energy value during occurrence & restoration shall have to be provided in all the above-mentioned tamper conditions in BCS AND HES with date and time. (In Event logging Snapshots shall be considered to be reflection of the actual phenomenon occurred).

15.10 All authenticated commands shall be Base Computer Software (BCS AND HES) controlled. All transactions with Smart Meter shall be date and time logged, in the downloaded data (Last 12 month's transactions).

15.11 Properly designed Smart Meter tamper logic shall be provided and clearly explained in the bid. The tamper logic shall be capable of discriminating the system abnormalities from source side and load side and it shall not log/record tamper due to any source side abnormalities. More than one tamper *CT related/ PT related/ others* shall not be logged at a time. A minimum of 300 events (one event means either occurrence or restoration) of all types of tamper with date & time stamping shall be available in `Smart Meter memory compartment wise. The logging will be on FIFO basis. The events will be divided into three compartments like CT related (148 Events), PT related (88 Events) and others (64 Events).

15.12 Smart Meter shall have a continuous and clear indication in its display if top cover is removed / opened and even re-fixed (non-rollover) and only cover open must be logged in BCS AND HES without any restoration. COVER OPEN tamper is to be displayed after every para Smart Meter displayed in Auto Display Mode.

16.0 INFLUENCE QUANTITIES

The Smart Meter shall work satisfactory with guaranteed accuracy as per limit provided in IS: 14697/16444 Part II under presence of the following quantities:

16.1 Electromagnetic field
16.2 External magnetic field
16.3 Radio frequency interference
16.4 Vibration
16.5 Harmonic wave form
16.6 Voltage fluctuation
16.7 Frequency variation
16.8 Electromagnetic high frequency field
16.9 Electrostatic discharge

17.0 IMMUNITY TO ELECTRO MAGNETIC DISTURBANCE

The Smart Meter shall be designed in such a way so that external electromagnetic field up to 0.5Tesla or electrostatic discharge up to 35kV either shall not influence its performance, i.e., the Smart Meter shall remain immune to it, or, if not so, it shall log event and shall record energy with I_{max}.

18.0 MEASUREMENT OF HARMONICS

The Smart Meter shall be capable of measuring fundamental as well total energy i.e., fundamental plus harmonics energy. Total energy (both active & apparent) shall be made available on Smart Meter display. Provision for utilizing measured fundamental energy shall be kept for future use. Both total and fundamental energy shall be logged in the Smart Meter memory and shall have provision for downloading to the BCS AND HES through the laptop.

19.0 MAXIMUM DEMAND & ITS RESETTING

19.1 The Smart Meter shall be capable of recording the Apparent MD with integration period of 15 minutes (programmable).
19.2 The Smart Meter shall also record MD at preset dated and time.
19.3 MD reset shall be through each of the three means:
  19.3.1 Automatic resetting at preset date & time (at present it will be at 00.00 hrs. of the first day of every month)
  19.3.2 Manually i.e., by using push button
  19.3.3 Through Remote Communication command.
19.4 The means by which the reset has been done shall be made available in downloaded data.
19.5 MD reset button shall have proper sealing arrangement.
19.6 There shall be separate Push button for scrolling display (up and down) and MD reset. If only two Push buttons are used minimum 30 sec pressing is required for MD reset.

20.0 LOAD SURVEY

The Smart Meter shall be capable of recording load survey (both in Import/Net (Import - Export) mode) of Active Energy, Reactive Energy, Apparent Energy, Active Demand, Apparent Demand, Phase wise Current, Phase wise Voltage & Power Factor for a period of minimum 45 days for 15-minute integration period in both tabular as well as graphical format.

20.1 Active & Apparent Energy in MWh/KWh & MVAh/KVAh as the case may be (Import & Export mode shall be shown clearly)
20.2 Reactive Energy in MVARH/ KVarh as the case may be (Import & Export mode shall be shown clearly)
20.3 Demand in MVA/KVA and MW/KW as the case may be (Import & Export mode shall be shown clearly)
20.4 Current – phase-wise
20.5 Voltage – phase-wise
20.6 Power Factor

It shall be possible to transfer this data to BCS AND HES directly from Smart Meter or through MODEM or through GSM/CDM/GPRS communication. The data so obtained shall be displayed in both graphical & tabular format in BCS AND HES.

21.0 TIME OF DAY FACILITIES

The Smart Meter shall have facilities to record Active, Apparent Energies and MD in at least 8 zones. The time zones shall be user programmable through authenticated Laptop/RMR command. Necessary software for the same is to be provided by the Smart Meter supplier. At present TOD timings will be programmable as follows:

21.1 TOD 1: 06:00 Hrs. to 17:00 Hrs.
21.2 TOD 2: 17:00 Hrs. to 23:00 Hrs.
21.3 TOD 3: 23:00 Hrs. to 06:00 Hrs.

22.0 SMART METER READING DURING POWER OFF

In absence of input voltages, with the help of internal battery or external battery pack Smart Meter data shall be displayed in power off mode. It shall also be possible to read & download data using Laptop. In case of external battery pack battery, the arrangements shall be such that hands-free operation is possible. In case of external battery 10 years guarantee must be given for the external battery pack. Separate battery shall be used for this purpose (not RTC or processor battery). In case of Lithium battery rating shall be more than 500mAh.

23.0 SELF DIAGNOSTIC FEATURES

The Smart Meter shall be capable of performing complete self-diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data in memory location. The details of malfunctioning shall have to be recorded in the Smart Meter memory. The bidder shall furnish the details of self-diagnostic capability features, viz Memory (NVM) status, Battery status, RTC Status etc. and it shall have to be made available in display.

24.0 COMMUNICATION CAPABILITY:

24.1 The Smart Meters will have the capability on smart features with GPRS Connectivity under the scope of IS 16444 Part II/15959.

24.2 The Smart Meter shall have a galvanic isolated Optical Port as per IEC 1107/ANSI/PACT so that it can be easily connected to a Mobile phone Smart Meter reading app-based application for data transfer.

24.3 The optical port shall be provided with proper sealing arrangement so that its cover can't be opened without breaking its seal. In case sealing arrangement is not there, access through authentication shall have to be ensured.

24.4 A Serial Port (RS485 or **RJ11)** may be provided inside the terminal cover and shall be optional to enable automatic Smart Meter reading through modem, if required in future. This Serial Port shall be housed inside the Smart Meter terminal cover so that it can't accessed without opening the sealed terminal cover.

24.5 The stored data in the Smart Meter shall be available through Laptop even when the display of the Smart Meter is not available.

24.6 Date in the Smart Meter shall be reset only through commands from the Laptop. Correction of RTC time, change of TOD timings etc. shall be done through Laptop utilizing authenticated command set by BCS AND HES.

24.7 Billing parameters shall be factory programmable.

24.8 Meter shall have ability to communicate with HES on any one of the technologies mentioned in IS 16444 (RF/Cellular/PLC) in a secure manner. For this project only, cellular based communication shall be used and the meter shall preferably accommodate dual SIM Card or e-SIM of any Telecom Service Provider to meet the Service Level Agreements (SLAs). The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

24.9 Plug-in Communication Module (NIC): The smart meter shall have a dedicated sealable slot for accommodating plug-in type bi-directional communication module which shall integrate the Cellular communication technology with the smart meter and act as interface between the meter and HES. The Plug-In module shall preferably be field swappable/replaceable and may be with the same make.

24.10 Integration: The bidder must ensure bi-directional data communication between the meter and HES for cellular communication technology.

24.11 Software and support:

1. The bidder shall supply following software and provide required training & manuals to use the same free of cost. Software for local communication, i.e., for Mobile App, Laptop and PC. This software shall be compatible with Android (11.0 and above) or Windows OS (10 and above), whichever is applicable. Software for firmware upgrading from remote-end mass deployment.

2. Bidder shall ensure integration of software with any of WBSEDCL system during the life of meter free of cost. WBSEDCL will provide all the required support for integration activity.

3. The bidder shall have to ensure DLMS compliance of the meter for both local & remote communication through its Optical port and NIC card.

24.12 Software for local communication: The manufacturer has to provide software capable of downloading all the data stored in meter memory through Mobile app, Laptop and PC. The manufacturer shall also provide software for Android and Windows devices. The bidder has to ensure that all required reading and diagnostic tools are available with them to ensure SLA as mentioned in Tender. Specification and costing of these tools shall be shared with WBSEDCL incase WBSEDCL wants to maintain their own devices.

24.13 Meter data for manual collection through mobile app: In case the meter data is not received through AMI, the manual meter reading data using mobile devices through the meter reading app shall be directly uploaded to the HES.

24.14 Training: Manufacturer shall impart training to WBSEDCL personnel for usage of software.

24.15 Port protection: All ports shall be optically isolated from the power circuit.

24.16 Operation: Optical port and NIC Card shall work independently. Failure of one (including display) shall not affect the working of the other.

24.17 Communication protocol: As per IS-15959 (Part3) as applicable.

24.18 Data transfer rate: Communication ports shall have to support data transfer rate of 9600 Bps (minimum)

24.19 Data Security: Advanced Security outlined in clause 7.1.2 of IS-15959 (Part1)

24.20 Encryption for data communication: As per clause 7.1 of IS15959 (Part2)

24.21 Encryption/ Authentication For data transport: As per clause7.2 of IS15959 (Part2)

24.22 Key requirements and handling: As per clause 7.3 of IS15959 (Part2)

24.23 IP communication profile support: As per clause 8 of IS 15959 (Part2).

Note: Meter shall support TCP-UDP/ IP communication profile for smart meter to HES.

24.24 Antenna port: The meter should have a port for connecting external antenna of strength 5 dBi or more in case the signal strength of the SIMs is poor. The antenna shall be supplied by the manufacturer for this scenario.

25.0 General requirement for communication module for Smart Meters

The communication module for smart meter may be of the same make of the meter. This shall be applicable on all relevant clauses of the communication module of the NIT.

The design and the pin configuration specified in the tender shall be indicative and shown for representational purpose only. Manufacturer design may be accepted.

Part I

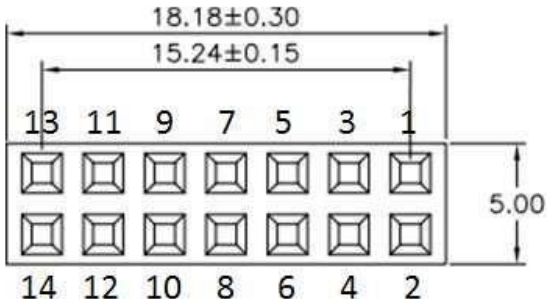
1. Recommended Module Placement location: In order to improve the performances of Cellular technologies encompassing, it is recommended to place the communication module anywhere on the accessible part of the meter. This will also enable an easy approach to improve antennae performances.
2. Meter shall have the means of tamper detection to record the event(s) of the removal of the communication module set from the meter, irrespective of whether the meter is in power on (has supply) or powered off (no supply) condition.
3. The Module shall be hot swappable and shall fit snugly inside the meter box, so that the same IP class of the meter is maintained.
4. A transparent cover may be used for the purpose,
   a. To have a sealing arrangement with the meter body as well as,
   b. For easy viewing of LED indicators and antenna assembly without having to open the cover.

Part II

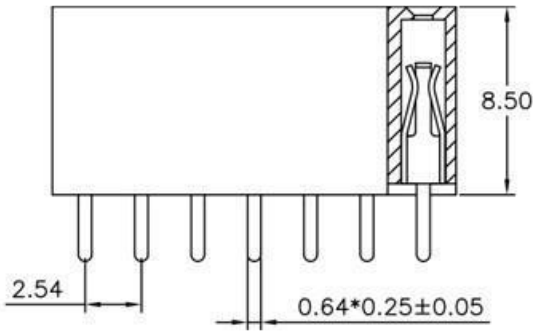
Communication interface: The meter shall have a slot of an appropriate size to allow for the pluggable communication to be fit in to the meter. The meter shall provide a 14-pins Female socket connector (2*7 pin, 2.54 mm). The socket shall be selected and positioned to ensure that the male pins on the communication module can connect reliably and easily connect with the female contactors on the meter.

Female connector

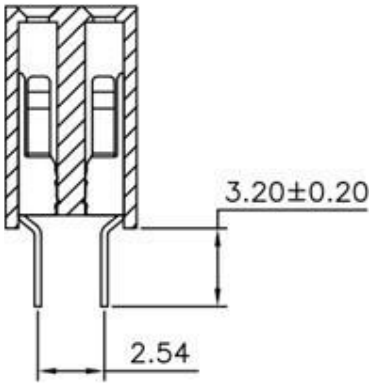
1. Front View：



2. Top View:



3. Side View:



PIN Outs may be provided as per below details:

Pin No	Name	Input/output	Description
1	Reserved	/	/
2	Reserved	/	/
3	Power EN	Output	Control the module's power supply
4	Reserved	/	/
5	Reserved	/	/

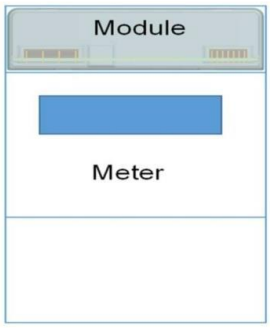
6	Meter TXD	Output	To Module UART port RXD, Min.38400
7	Meter RXD	Input	From Module UART port TXD, Min.38400
8	Reserved	/	/
9	RTS	Input	Input digital signal from module
10	RST	Output	Reset signal for module
11	CTS	Output	Output digital signal to module
12	+Vdc	Power	As per IS16444
13	GND	Common	Ground Reference Potential
14	GND	Common	Ground Reference Potential

Part III

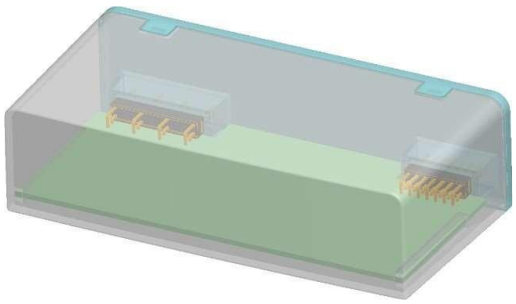
The following reference size may be adhered to irrespective of a single or multiple communication options provisioned on the same module. This standard form factor and dimensions will enable physical and functional interoperability with different makes of meters.

A. Module 3-D views (For Representational Purpose Only)

1. Module in meter (Top View)



2. 3D View

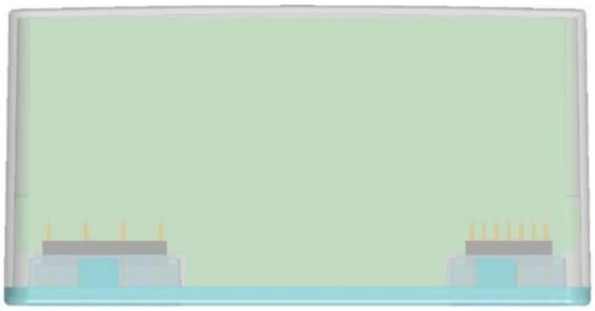


3. Front View

4. Back View

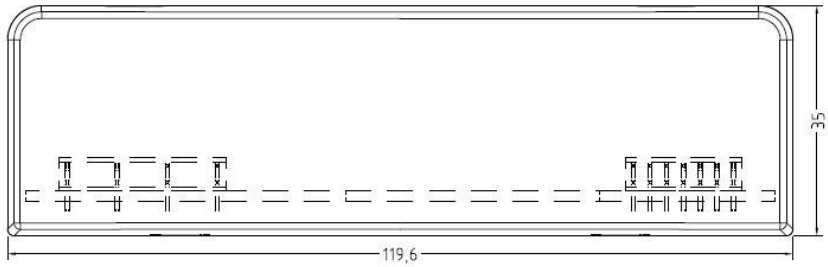
5. Side View

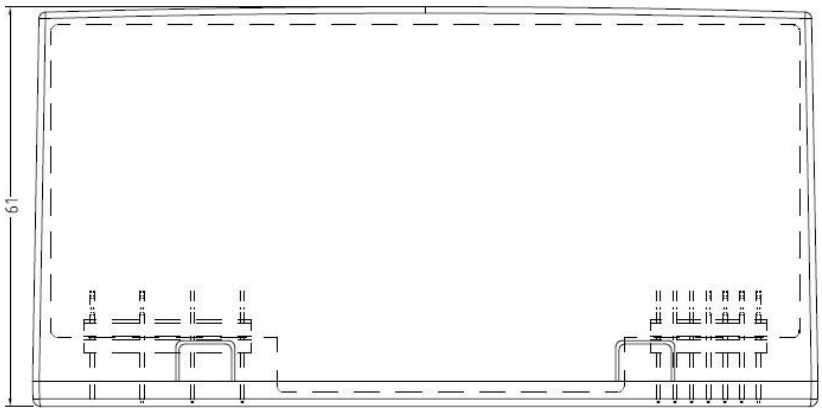
6. Top View

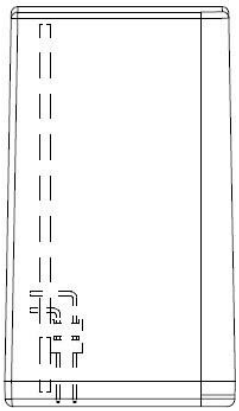


7.Bottom View

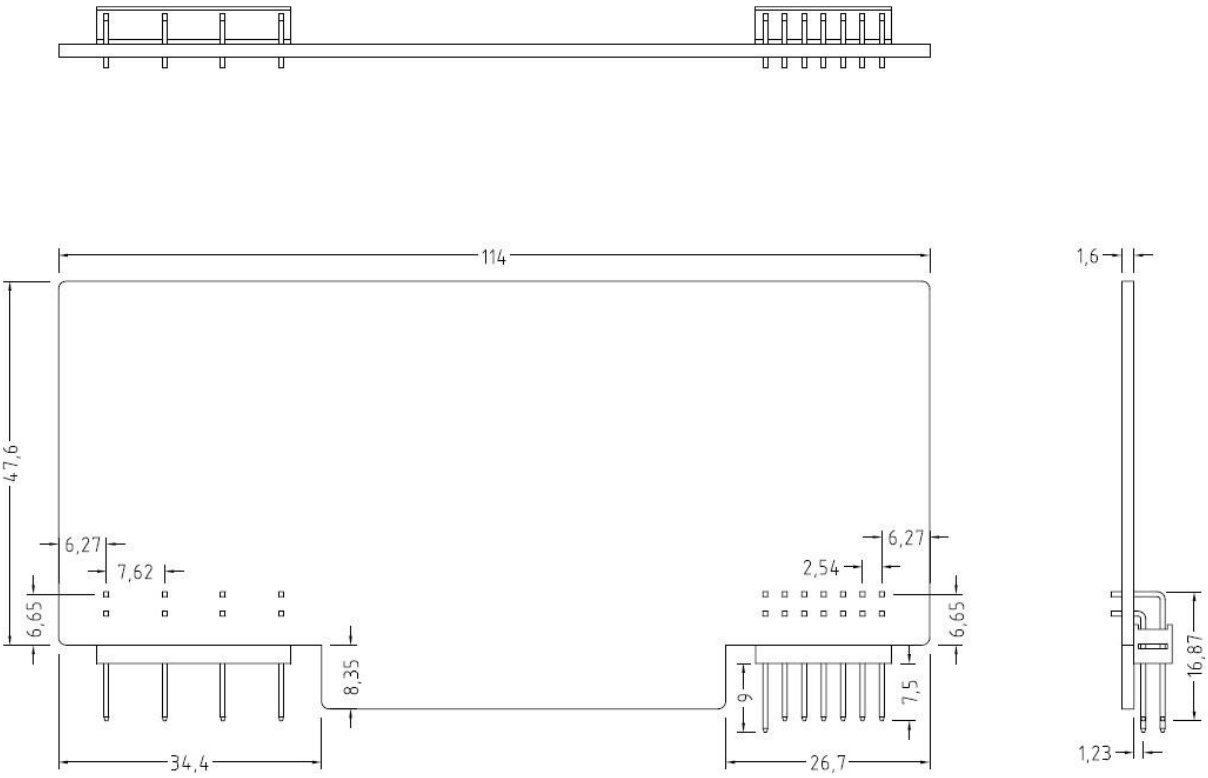
B. Module Dimensions







C. Overall view of the module's PCBA:



Notes: **Module** **Reference** **Sizes:** **unit**

26.0 TECHNICAL SUPPORT, MANUALS &TRAINING

Extensive technical support, detailed technical literature (shall supply with each Smart Meter at the time of packing) & training is to be provided by the manufacturer free of cost.

In case external battery packs are required for the offered Smart Meters, those are to be provided by the manufacturer and shall have clear mention in offered bids.

27.0 BASE COMPUTER SYSTEM & SOFTWARE REQUIREMENTS

27.1 The data stored in the Smart Meter memory including **defrauded energy** shall be available on the BCS AND HES.

27.2 BCS AND HES shall give all details pertaining to billing and load survey data.

27.3 All the data available in the Smart Meter including energy, MD etc. with date and time stamp, new TOD time zones and historical data shall be available in BCS AND HES after down loading. All the data/ items of Push Button Mode Display Parameter List should be available in BCS / HES in preferably better resolution.

27.4 The Smart Meter condition details shall also be transferred into the BCS AND HES including abnormal voltage & current conditions, tamper events etc.

27.5 Facility to view data incorporating external multiplying factor due to installed CT & PT may preferably be provided in BCS AND HES.

27.6 The BCS AND HES shall have facility to convert Smart Meter reading data into user definable

ASCII file format so that it can be integrated with the billing system or any other third-party software. The user shall have the flexibility to select the parameters to be converted into ASCII file.

27.7 The bidder has to supply the Smart Meter reading protocol and API free of cost. The bidder shall indicate the relevant standard to which the protocol is compliant.

27.8 In BCS AND HES twelve months' data for MWh, MVAh, MD in MVA (total & TOD wise), average load factor, average power factor in both Import/Net (Import - Export) mode must be available.

27.9 Six copies of BCS AND HES shall be provided for downloading data and issue of authenticated command from Laptop.

27.10 Smart Meter Data Display:

27.10.1 The BCS AND HES shall show electrical conditions existing at the time of reading the Smart Meter in tabular forms as well as in graphical format (phase or diagram)

27.10.2 All the information shall be shown in a manner which user can understand easily.

27.10.3 All the load survey data shall be available in numerical as well as graphical format. It shall also be possible to view this data in daily, weekly and monthly formats. The load survey graph shall also show values where the cursor/pointer is placed for selected or all parameters.

27.10.4 All the information about tamper events shall be accompanied with date & time stamping along with the -Snapshot‖(details) of the respective electrical conditions. This information shall be displayed in the sequence in which it happened, in cumulative format as well as summary format. The cumulative format shall segregate a particular tamper information and summary report should show count of tamper occurrence and the duration for which Smart Meter remained under tamper condition.

27.11 Support Display: There shall be user-friendly method for viewing current and stored history Smart Meter data. All information about a particular consumer shall be segregated and available at one place so that locating any consumer's past data is easy. It shall be possible to locate/retrieve data on the basis of one of the following particulars:

i. Consumer ID
ii. Smart Meter Serial No.
iii. Date of Smart Meter Reading
iv. Location

27.12 Configurability: It shall be possible to get selective print out of all the available data of the Smart Meter. Print out shall not include anything and everything available with the BCS AND HES. The software shall support "Print Wizard" or similar utility whereby user can decide what to print out. The user of the software need not revert back to the supplier of the software for modifying the software just to print what he desires.

It is very important that the BCS AND HES has the feature to export available data to ASCII or spreadsheet format for integrating with the WBSEDCL's billing system. Here again an "Export Wizard" or similar utility shall be available whereby user can select file format (for ASCII or for spreadsheet), what data to export, the field width selection (whether 8 characters or 10 characters, to include decimal point or not, number of digits after decimal point) etc.

27.13 Security: The BCS AND HES shall have multi-level password for data protection and security. The first level shall allow the user to enter the system. The different software features shall be protected by different passwords. The configuration of passwords shall be user definable. The software installed on one computer shall not be copy-able on to another computer.

27.14 Help: The exhaustive on-line Help should be available with the software so that user can use all the features of the software by just reading the Help contents.

28.0 Daily Load Profile Parameter:

1. Real Time & Date (DD/MM/YYYY)
2. Cumulative Active Import Energy
3. Cumulative Active Export Energy
4. Cumulative Apparent Forward Energy (Active Import)
5. Cumulative Apparent Forward Energy (Active Export)
6. Apparent Forward Maximum Demand (Active Import)
7. Apparent Forward Maximum Demand (Active Export)
8. Active Forward Maximum Demand (Import)
9. Active Forward Maximum Demand (Export)
10. TOD wise Cumulative Active Forward Energy (Import)
11. TOD wise Cumulative Active Forward Energy (Export)
12. TOD wise Cumulative Apparent Forward Energy (Import)
13. TOD wise Cumulative Apparent Forward Energy (Export)
14. TOD wise Apparent MD (Import) with Date & Time
15. TOD wise Apparent MD (Export) with Date & Time

The above parameters shall be logged at midnight (at 00:00 hrs.) and these parameters are meant for billing purpose.

The storage time will be same as load survey data.

29.0 GENERAL REQUIREMENTS

29.1 GUARANTEED TECHNICAL PARTICULARS: The bidder shall furnish all the necessary information as desired in the Schedule of Guaranteed Technical Particulars and data, appended with this Specification. If the bidder desires to furnish any other information in addition to the details as asked for, the same may be furnished against the last item of this **Sub Annexure– I**.

29.2 TECHNICAL DEVIATIONS: Any deviation in Technical Specification as specified in the Specification shall be specifically and clearly indicated in the Schedule of deviation format.

29.3 TESTING:

29.3.1 **Type Testing of Smart Meter:** The offered Smart Meters shall be type tested at any NABL accredited laboratory in accordance with relevant IS and CBIP Report 325 with their latest amendments. The type test report shall not be more than 3 (three) years old. A copy of the Type Test results shall be enclosed with the offer. If there is any modification in the design

Parameters of the specifications or use of constituent materials in the offered Smart Meters submitted with the offer, from the Smart Meter which was submitted type tested, which may affect the characteristics as well as

parameters of the Smart Meter, revised type test certificates as per the design, parameters and constituent material used in the offered Smart Meter, shall have to be submitted failing which the offer may be liable to be rejected. Type Test Certificate from any NABL accredited Lab shall only be considered. Type test certificate shall contain the following information clearly:

29.3.1.1 Type of display or LCD
29.3.1.2 Class of accuracy
29.3.1.3 Smart Meter constant
29.3.1.4 Type of Smart Meter

29.3.2 **Acceptance tests:** The acceptance tests as stipulated in CBIP / IS (with latest amendments) shall be carried out by the supplier in presence of purchaser's representative. In case of failure of Smart Meters as specified in Recommended Sampling Plan of IS-14697/ 16444 Part-II, the entire lot will be treated as rejected. Also, the following additional tests are to be carried out on one Smart Meter randomly selected from each lot offered for inspection / acceptance testing. In case of failure of any single Smart Meter the entire lot will be rejected.

29.3.2.1 Magnetic induction of external origin (AC & DC)
29.3.2.2 Tamper & Fraud protection, as per relevant Clause of this specification.
29.3.2.3 Test of endurance up to 150% of I_{max}, for two hours, followed by verification of limits of error.
29.3.2.4 Verification of internal components.
29.3.2.5 Dry Heat Test under Test of Climatic Influences in relevant IS of one Smart Meter from the offered lot is to be arranged by the supplier at any NABL accredited laboratory, at his cost.

29.3.3 **Routine Tests :** Each and every Smart Meter of the offered lot shall undergo the routine tests as well as functional tests as per IS: 14697/1999, CBIP Report 325, 16444 Part-II and after sealing the Smart Meters, the manufacturers will have to submit the routine test report of all the Smart Meters as well as a statement showing seal Sl. Nos. against each Smart Meter Sl. No. of offered lot in soft copy (MS WORD or EXCEL format), to the Chief Engineer(Procurement and Contract) and the Chief Engineer(DTD), along with offer letter for acceptance test.

29.4 TEST FACILITIES: The tests for equipment / instrument shall be carried out as per relevant Standards and test certificates shall be furnished for scrutiny. The Bidder shall indicate the details of the equipment available with him for carrying out the various tests as per relevant Standards. The bidder shall indicate the sources of all equipments / instruments.

29.5 The standard Smart Meters used for conducting tests shall be calibrated periodically at any NABL Accredited Test Laboratories and test certificates shall be available at Works for verification by purchasers' representative.

29.6 The manufacturer shall have at least the following testing facilities to ensure accurate calibration:

29.6.1 AC high voltage test
29.6.2 Insulation test
29.6.3 Test of no-load condition
29.6.4 Test of Starting condition
29.6.5 Test on Limits of error (Automatic Testing facility with ICT)
29.6.6 Power loss in voltage and current circuit
29.6.7 Test of Repeatability of error
29.6.8 Test of Smart Meter constant
29.6.9 Test of magnetic influence (As per CBIP 325 & Permanent Magnet)

29.7 INSPECTION:

29.7.1 The purchaser may carry out the inspection at any stage of manufacture. The manufacturer shall grant free access to the purchaser's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the purchaser shall not relieve the supplier of his obligation of furnishing the equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective. All acceptance tests and inspection shall be made at the place of manufacturer unless otherwise especially agreed upon by the Bidder and purchaser at the time of purchase. The Bidder shall provide all reasonable facilities without charge to the inspector, to satisfy him that the equipment is being furnished in accordance with this specification.

29.7.2 The supplier shall keep the purchaser informed in advance, about the manufacturing program for each lot so that arrangement can be made for inspection. The purchaser reserves the right to insist for witnessing the acceptance / routine testing of the bought-out items. The supplier shall give 15 days for local supply / 30 days in case of foreign supply advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests.

29.7.3 The purchaser reserves the right to get type test any Smart Meter, for Smart Meter casing etc. from any of the offered lots, reserve at any destination stores.

30.0 SUBMISSION OF SAMPLE SMART METER

30.1 The bidder will submit his sample Smart Meters in sealed casing / cartoon along with relevant Smart Meter documents (**As per Sub-Annexure-IV)**, on any working day, from 11.00 A.M. to 04.00 P.M. on working days within the specified period of submission latest by 01.00 P.M. to the Office of the Chief Engineer (DTD), Abhikshan, Sec-V, Salt Lake, Kolkata-91. The bidder will be given a receipt, jointly signed by the bidder and DTD officials, mentioning the samples and papers submitted by the bidder as per check list.

30.1.1 While submitting the samples and required documents as per Annexure-IV, the bidder shall submit the requisite numbers of sealed Smart Meters as per the specifications stated herein before.

30.1.2 The date of testing of sample Smart Meters will be intimated to the bidders by CE(DTD) and during such test other bidders will also be allowed to witness the testing. Sample submission and Test procedure may be changed due to emergency requirement. On the date of testing of sample Smart Meters of a particular bidder, he shall come prepared with the following:

30.1.2.1 BCS AND HES (as per specification)

30.1.2.2 Laptop compatible with BCS AND HES and loaded with Laptop software.

30.1.2.3 Modem and accessories for testing the remote Smart Meter reading

30.1.2.4 Any other accessories required for observing the performance and capabilities of the Smart Meters.

31.0 QUALITY ASSURANCE PLAN

The design life of the Smart Meter shall be minimum 10 years and to prove the design life the firm shall have at least the following quality Assurance Plan:

31.1 The factory shall be completely dust proof.

31.2 The test rooms shall be temperature and humidity controlled as per relevant Standards.

31.3 All test equipment shall have their valid calibration certificates.

31.4 Smart Meter shall be tested in fully automatic test bench with ICT and results shall be printed directly without any human errors.

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

32.0 THE CHECKS TO BE CARRIED OUT DURING MANUFACTURING OF THE SMART METERS

32.1 Smart Meter frame dimensions tolerances shall be minimal.

32.2 The CT coil shall be made totally encapsulated and care shall be taken to avoid ingress of dust and moisture inside the coil.

32.3 The assembly of parts shall be done with the help of jigs and fixtures so that human errors are eliminated.

33.0 LAB FACILITY: The laboratory of manufacturer must be well equipped for testing of the Smart Meters. They must have computerized standard power source and standard equipment calibrated not later than a year (or as per standard practice).

34.0 MANUFACTURING ACTIVITIES:

34.1 All the materials, electronics and power components, ICs used in the manufacture of the

Smart Meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy. The manufacturer shall use Application Specific Integrated Circuit (ASIC) or Micro controller for Smart Metering functions.

34.2 The electronic components shall be mounted on the printed circuit board using latest Surface Mounted Technology (SMT) except power components by deploying automatic SMT pick and place machine and re flow solder process. The electronic components used in the Smart Meter shall be of high quality and there shall be no drift in the accuracy of the Smart Meter at least up to 10 years.

34.3 Further, the Bidder shall own or have assured access (through hire, lease or sub-contract) of the mentioned facilities. The PCB material shall be of glass epoxy FR-4 grade conforming to relevant standards.

34.4 All insulating materials used in the construction of Smart Meters shall be non-hygroscopic, non-ageing and tested quality. All parts that likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating. Quality shall be ensured at the following stages.

34.4.1 At PCB manufacturing stage, each board shall be subjected to bare board testing.

34.4.2 At insertion stage, all components shall undergo testing for conforming to design parameters and orientation. Complete assembled and soldered PCB shall undergo functional testing using test equipments (testing jig).

34.5 Prior to final testing and calibration, all Smart Meters shall be subjected to accelerated ageing test to eliminate infant mortality, i.e., Smart Meters are to be kept in ovens for 72 hours at 55 deg Centigrade temperature & atmospheric humid condition. After 72 hours Smart Meters shall work correctly. Facilities / arrangement for conducting ageing test shall be available with the manufacturer.

34.6 The calibration of Smart Meters shall be done in-house.

35.0 DOCUMENTATION:

33.1 Twenty sets of operating manuals shall be supplied to the office of the CE (DTD) for distribution at sites.

33.2 One set of routine test certificates shall accompany each dispatch consignment.

33.3 The acceptance test certificates in case pre-dispatch inspection or a routine test certificate in cases where inspection is waived shall be approved by the purchaser.

36.0 GUARANTEE

34.1 The Smart Meters shall be guaranteed for a period of **5½ years** from the date of supply.

34.2 Life of battery used for the Smart Meter shall be guaranteed for 10 years.

37.0 REPLACEMENT OF DEFECTIVE SMART METERS

The Smart Meters declared defective within the above guarantee period by the WBSEDCL shall be replaced by the supplier up to the full satisfaction of the WBSEDCL at the cost of supplier within one month on receipt of intimation. Failure to do so within the time limit prescribed shall lead to

imposition of penalty of twice the cost of Smart Meter. The same may lead to black listing even, as decided by WBSEDCL. In this connection the decision of WBSEDCL shall be final.

38.0 PACKING & FORWARDING

38.1 The equipment shall be packed in cartons / crates suitable for vertical / horizontal transport as the Case may be, and suitable to with stand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Supplier without any extra cost shall supply any material found short inside the packing cases immediately.

38.2 The packing shall be done as per the standard practice as mentioned in IS 15707: 2006. Each package shall clearly indicate the marking details (for e.g., manufacturer's name, Sl. Nos. of Smart Meters in the package, quantity of Smart Meter, and other details as per supply order). However, the supplier shall ensure the packing is such that, the material shall not get damaged during transit.

39.0 COMPONENT SPECIFICATIONS

The Smart Meters shall be designed and manufactured using SMT (Surface Mount Technology) components, except for power supply components, LED / LCD etc., which are PTH type. All the material and electronic power components used in the manufacture of the Smart Meter shall be of highest quality and reputed makes so as to ensure higher reliability, longer life and sustained accuracy. The Components used for manufacture of Smart Meter shall be of high quality and the bidders shall confirm component specification as specified below in Annexure-III Bidders shall compulsorily fill Annexure-I, Annexure-II & Annexure-III for technical qualification.

Sl. no.	Component Function /Feature	Requirement	Make / origin
1	Current Element	E-beam/spot welded CT shall be provided in the phase element and in the neutral with proper isolation.	Any make or origin conforming to IS-2705
2	Measurement /computing chips	The Measurement / computing chips used in the Smart Meter shall be with the Surface mount type along with the ASICs.	USA: Analog Devices, AMS, Cyrus Logic, Atmel, SAMES, Texas Instruments, Teridian; Japan: NEC, Freescale, Renesas; Holland: Phillps
3	Memory chips	The memory computing chips shall not be affected by the external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: National Semi Conductor, Atmel, SAMES, Texas Instruments, Teridian, ST, Microchip; Japan: Hitachi, OKI, Freescale, Renesas; Holland / Korea: Phillps

4	Display modules	The display modules shall be well protected from the external UV radiations. The display shall be clearly visible over an angle of at least a cone of 70o.The construction of the modules shall be such that the displayed quantity shall not disturbed with the life of display. The display shall be TN type industrial grade with extended temperature range	Singapore: Bonafide Technologies; Korea: Advantek; Japan: Hitachi, SONY, Hijing, Truly Semiconductor; China: Tianma
5	Communication modules	Communication modules shall be compatible for the RS 232 ports as per reference under 15959	USA: National Semiconductors, HP, ST, Texas Instruments, Agilent, Avago; USA / Korea: Fairchild; Holland/ Korea: Philips; Japan: Ligitek, Hitachi, Germany: Siemens, Taiwan: Everlight,
6	Optical port	Optical port shall be used to transfer the Smart Meter data to Smart Meter reading instrument. The mechanical construction of the port shall be such to facilitate the data transfer easily.	USA: National Semiconductors, Texas Instruments, HP, Agilent, Avago, Germany/USA: Osram; Japan: Hitachi, ,21; Germany: Siemens; Holland/Korea: Philips; Taiwan: Everlight,
7	Power Supply	The power supply shall be with the capabilities as per the relevant standards. The power supply unit of the Smart Meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	As specified.
8	Electronic components	The active & passive components shall be of the surface mount type & are to be handled &soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Phillips, Texas Instruments, ST, Onsemi; Japan: Hitachi, Oki, Toshiba. Freescale; Korea: Samsung.
9	Mechanical parts	The internal electrical components shall be of electrolytic copper &shall be protected from corrosion, rust etc. The other mechanical components shall be protected from rust, corrosion etc. by Suitable plating / painting methods.	N.A.
10	Battery	Lithium-ion with guaranteed life of 10 years	Renata, Panasonic, Varta, Sanyo, National, Tadiran, Sony, Duracell, Tekcell, Mitsubishi, EVE, SAFT, XENO
11	RTC / Micro controller	The accuracy of RTC shall be as per relevant IEC / IS standards	USA: Dallas, Atmel, Motorola, NEC, Teridian Renesas, Texas Instruments, ST, Microchips, Epson; Holland / Korea: Philips; Japan: NEC, OKI, Hitachi, Mitsubishi, Freescale,

1. Tamper Logic and Display parameters will be liable to changes and will be informed subsequently during Observation.

2. Default programmable features should be available (like conversion / interchangeability between from Import Mode or Imp/Exp (net) Mode.
3. GTP and Tamper logic will be confirmed after sample testing.

Tamper Logic-HT (Provisional)

Sl. No	Parameter	Occurrence	Restoration
1	**Power Related Tamper:**		
i)	**Power Failure**	If power goes off for more than persistence time	Power restores
	Logging Time	After 5 min	Immediate
2	**Voltage Related Tamper:**		
i)	**Invalid Voltage**	i) V3x > 70 % of Vref	i) V3x Ignored
		ii) Difference of angles between two phases ≤ 10 degrees	ii) Difference of angles between two phases > 10 degrees
	Logging Time	After 5 min	After 5 min
ii)	**Missing Potential (Logging Phase Wise)**	i) Vx<15%of Vref	i) Vx>40% Vref
		ii)Current Ignored	ii) Current Ignored
	Logging Time	After 5 min	After 5 min
iii)	**Voltage Unbalance**	V3x>70% of Vref	V3x>70% of Vref
		(Vmax-Vmin)>10% of Vref	(Vmax-Vmin) <10% of Vref
	Logging Time	After 5 min	After 5 min
iv)	**High Voltage**	Any Vx>115%Vref	V3x<115%Vref
	Logging Time	After 5 min	After 5 min
3	**Current Related Tamper**		
i)	**CT Open (Logging Phase Wise)**	i) Iresidual>10% of Ib	i) Iresidual<10% of Ib
		ii) Phase current<2% of Ib	ii) Phase current ignored
		iii) Average Line Current ignored	iii) Average current>10%of Ib
	Logging Time	After 5 min	After 5 min
ii)	**CT Bypass**	I residual >10% Ibasic	I residual <10% Ibasic
		Ix>2% Ib	Phase current ignored
		Average line current: Ignored	Iavg> 10 % Ibasic
	Logging Time	After 5 min	After 5 min
iii)	**Over Current**	Any Ix > 150% of Ibasic	I3x < 150% of Ibasic
	Logging Time	After 5 min	After 5 min
iv)	**CT Reversal (Phase wise)**	Ix> 5%of Ib	Ix> 5% of Ib
		Direction: Negative	Direction: Positive
		Net Power factor > 0.5	Net Power factor > 0.5

	Logging Time	After 5 min	After 5 min
v)	**Current Unbalance**	Imax-Imin>30% of Imax for that period	Imax-Imin<29% of Imax for that period
		Average line current>5% of Ib	Average line current>5% of Ib
	Logging Time	After 5 min	After 5 min
4	**Other Tampers:**		
i)	**Low PF**	i) All Phase Currents > 10% of Ib	i) All Phase Currents > 10% of Ib
		ii) Average PF < 0.3	ii) Average PF > 0.3
	Logging Time	After 5 min	After 5 min
ii)	**Magnetic Tamper**	Whenever the Meter functionality gets affected on account of presence of any magnetic field, Meter shall log it as an Event and start recording at Imax if does not remain immune. Same shall be logged with date & time stamp.	
	Logging Time	30 sec (Approx.)	30 sec (Approx.)
iii)	**Cover Open**	On Removal of Meter Cover the Meter will lock Cover Open Event with Date and Time Stamp, it must be reflected in Auto Display mode	No restoration.
	Logging Time	Immediate	

In addition to above, Tamper Logic for 3 Phase 4 Wire Import/Net (Import - Export) Meter

	Neutral Disturbance and Magnet	Under any circumstances, if meter logs Neutral Disturbance or Magnetic Field Tamper event and starts recording at Imax then it will log in Import Register instead of Export Register.
	Current Reverse	If all three CT are in reverse, no Current Reversal Tamper should occur.
	Manual Resetting of Maximum Demand:	When Reset Button is pressed within an Integration Period, Rising Demand will not reset to Zero. The Demand will be registered for the entire Integration Period and will be logged as Current Max. Demand at the end of the Integration Period.
Please note: V_{3x} Voltage in all Phases V = Voltage In any Phase 1_{3x} = Current in all Phases I_x= Current in any phase		

Sub Annexure-I
GTP for Meter

Sl. No.	Item Description	Manufacturer's Particulars
1.	Maker's name and country	To be specified by the Bidder
2.	Type of meter/model	To be specified by the Bidder
3.	Standard Applicable	IS 14697, IS 15959, CBIP 325,16444 Part II
4.	Accuracy/Interface class	0.55
5.	Parameters displayed	As per Specification
6.	P.F. Range	Zero lag — unity — Zero Lead
7.	Basic Current (lb) (.15A)	5A

8.	Maximum Current (Imax)	10A
9.	Minimum starting current	0.1% of I-basic
10.	Rated Voltage	110 V: Phase to Phase, 63.5 V: Phase to Neutral
11.	Meter Constant	To be specified by the Bidder
12.	Variation of voltage at which meter functions normally	70% to 120% of reference Voltage
13.	Rated Frequency	50 Hz±5%
14.	Power Loss in Voltage circuit (VA & watt) & Current circuits (VA)	Voltage Circuit: Will not exceed 1.5W and 10VA per phase Current Circuit: Will not exceed 1.0 VA per phase
15.	Dynamic range	As per IS 14697/16444 Part-II
16.	MD reset Provisions	Possible to reset MD by any of the following options:1 1.Remote MD reset 2.Manual MD reset 3.MD reset by Laptop 4.Auto Monthly Reset
17.	Display: a) Type of register b) No. of digit of display and height of character c) Auto display mode & scroll mode d) Type of push button for scroll mode	Display will be a) LCD b) 7-digit 7-segment, height- 10x5mm c) As per approved sample d) Spring loaded push button or capacitive touch pads
18.	Nonvolatile memory	To be provided as per Specification
19.	Details of provision for taking reading during power off condition	Through internal non-rechargeable battery
20.	Principle of operation	As per technical Specification
21.	MD integration period	15 minutes
22.	Weight of meter	To be specified by the Bidder
23.	Dimensions	To be specified by the Bidder
24.	Warranty	5.5 years from the date of supply
25.	Outline drawings & leaflets	To be provided by the Bidder
26.	a) Remote meter- readout facility	Provision required
	b) Communication protocol used	DLMS
	c)Sealing provision for meter & optical port	To be provided as per Specification
	d)Baud rate of data transmission	9600 bps
	e) Required software to be resident in CMRI and BCS AND HES	To be provided by the Bidder
	f) Ultrasonic welding of body or any other technology which is equally or more efficacious	To be provided
	g) Manufacture Seal	To be provided
27.	Base Computer software	Compatible with windows 7 or above.
28.	Type test certificates	To be provided by the Bidder

29.	Time of day zones (selectable)	3 TOD Zones to be provided with a provision for 8 TOD Zones
30.	Whether meter measures both fundamental & harmonic energy	As per Specification
31.	Real time clock accuracy	Maximum drift ± 5 Minutes per annum.
32.	Battery for real time clock	It shall be Lithium-ion / Lithium battery having at least 10 years of life
33.	Anti-tamper features	As per Tamper logic provided by WBSEDCL.
34.	Effect of accuracy under tamper conditions	As per technical specification
35.	Drift in accuracy of measurement with time	As per IS: 14697 & CBIP 325 /16444 (Part-II)
36.	Name plate details	As per specification
37.	Type of calibration	Software calibrated
38.	Type of mounting	Projection mounting
39.	Testing facility	Shall be available with manufacturer, details to be provided
40.	Data retention by NVM without battery backup and un-powered condition	As per specification
41.	Type of material used:	
a.	Base	As per specification
b.	Cover	As per specification
c.	Terminal block	As per specification
d.	Terminal cover	As per specification
42.	Screw	
	i. Material	As per specification
	ii. Size	As per specification
43.	Internal diameter of terminal hole	5.5mm
44.	Centre to centre clearances between adjacent terminals	As per IS: 14697/16444 Part II
45.	Security profiles	
	a) Basic Security	To be provided
	b) Advance security	To be provided

Sub-Annexure II
Pre-Qualification Conditions for Three Phase Static Meters

SL. No.	Particulars	Remarks
1	Bidders must have valid BIS certification for the offered meter.	Yes / No
2	Bidder preferably possess ISO 9001 certification	Yes / No
3	Bidder shall be manufacturers of static meters having supplied Static 1-ph or 3-phase meters with memory and LCD display to Electricity Boards / Utilities in the past 2 years.	Yes / No
4	Bidder has Type Test certificate for the Type of offered meter not more than 3 (three) years old	Yes / No

5	Bidders shall have dust free, static protected environment for manufacture, assembly and Testing.	Yes / No
6	Bidder shall have automatic computerized test bench for lot testing of meters.	Yes / No
7	Bidder has facilities of Oven for ageing test.	Yes / No
8	Bidder shall submit certificate for immunity against magnetic influence of 0.2 T AC. & 0.5 T DC. from a NABL accredited Laboratory, for the same type of meter as offered.	Yes / No

Sub-Annexure III

SI No.	Component Function / Feature	As per Requirement
1	Current Element	
2	Measurement / Computing chips	
3	Memory chips	
4	Display modules	
5	Communication modules	
6	Optical port	
7	Power Supply	
8	Electronic components	
9	Mechanical parts	
10	Battery	
11	RTC / Micro controller	

Sub-Annexure IV

SI.	LIST OF DOCUMENTS TO BE SUBMITTED		
No.	DURING SAMPLE SUBMISSION		
1	Attested copy of type test reports from NABL accredited laboratory		
	Attested copy of BIS certificates of the same type of meter submitted as sample		
3	Attested certificates as regards material used for meter case, cover & terminal block.		
4	Annexure —11 as per tender documents		
5	Annexure — III as per tender documents		
6	Operating manual of the meter submitted		

40.0. LT BULK Meter DISPLAY

40.4 **Auto Display Mode**: In this mode, the below listed parameters shall be displayed in the following sequence (The display logic and parameters as followed are provisional and subject to change

after sample testing/firm order):

40.1.1 LCD Test
40.1.2 Smart Meter Serial Number
40.1.3 Real Time & Date (DD/MM/YYYY)
40.1.4 Rising Apparent Demand with elapsed time while Active Import
40.1.5 Rising Apparent Demand with elapsed time while Active Export
40.1.6 No. of Power Failures
40.1.7 Cumulative Active Import Energy (Cumulative sign/legend must be given)
40.1.8 Cumulative Active Export Energy
40.1.9 Cumulative Reactive Energy – Quadrant-I
40.1.10 Cumulative Reactive Energy – Quadrant-II
40.1.11 Cumulative Reactive Energy – Quadrant-III
40.1.12 Cumulative Reactive Energy – Quadrant-IV
40.1.13 Cumulative Apparent Energy (Import)
40.1.14 Cumulative Apparent Energy (Export)
40.1.15 Apparent Maximum Demand (Import)
40.1.16 Apparent Maximum Demand (Export)
40.1.17 Inst. Voltages – Phase-wise (P-N)
40.1.18 Inst. Currents – Phase-wise
40.1.19 Inst Neutral Current
40.1.20 Signed Inst. Power Factor – Phase-wise
40.1.21 Inst. Net Power Factor
40.1.22 Inst. Apparent Power
40.1.23 Signed Active Power in KW
40.1.24 Signed Reactive Power in KVAR
40.1.25 Frequency
40.1.26 Cumulative Billing Count
40.1.27 Cumulative Tamper Count
40.1.28 Cumulative Power Off Hours since manufacturing
40.1.29 Power **OFF** Hours of present month
40.1.30 Phase Sequence & Phase Correspondences of Voltage & Current
40.1.31 Connection Check
40.1.32 Self-Diagnosis
40.1.33 Cumulative Net Active Forward Import Energy
40.1.34 Cumulative Net Active Forward Export Energy

40.5 **Push Button mode:** Over & above the parameters of Auto Display Mode**, t**he following parameters shall be displayed on pressing the push button. The Smart Meter display shall return to auto display mode (mentioned above) if the push button is not operated for approx. more than 6 seconds.

Import Mode

40.5.2 LCD Test
40.5.3 Smart Meter Serial Number
40.5.4 Real Time & Date (DD/MM/YYYY)
40.5.5 Rising Apparent Demand with elapsed time while Active Import
40.5.6 No. of Power Failures
40.5.7 Cumulative Active Import Energy (Cumulative sign/legend must be given)

40.5.8 Cumulative Reactive Energy – Quadrant-I
40.5.9 Cumulative Reactive Energy – Quadrant-II
40.5.10 Cumulative Reactive Energy – Quadrant-III
40.5.11 Cumulative Reactive Energy – Quadrant-IV
40.5.12 Cumulative Apparent Forward Energy (Active Import)
40.5.13 Apparent Forward Maximum Demand (Active Import)
40.5.14 TOD wise Cumulative Active Forward Energy (Import)
40.5.15 TOD wise Cumulative Apparent Forward Energy (Import)
40.5.16 TOD wise Apparent MD (Import) with Date & Time
40.5.17 TOD wise Active MD (Import) with Date & Time
40.5.18 Inst. Voltages – Phase-wise (P-N)
40.5.19 Inst. Currents – Phase-wise
40.5.20 Inst Neutral Current
40.5.21 Signed Inst. Power Factor – Phase-wise
40.5.22 Inst. Net Power Factor
40.5.23 Inst. Apparent Power
40.5.24 Signed Active Power in KW
40.5.25 Signed Reactive Power in KVAR
40.5.26 Frequency
40.5.27 Cumulative Net Active Forward Import Energy
40.5.28 History 1 Cumulative Active Forward Import Energy
40.5.29 History 1 Cumulative Apparent Forward Import Energy
40.5.30 History 1 Apparent MD while Active Import with Date & Time
40.5.31 History 1 Average Power Factor
40.5.32 Cumulative Apparent MD (Import)
40.5.33 Last Billing Date & Time
40.5.34 Cumulative Billing Count
40.5.35 Cumulative Tamper Count
40.5.36 Cumulative Power Off Hours since manufacturing
40.5.37 Power OFF Hours of present month
40.5.38 Phase Sequence & Phase Correspondences of Voltage & Current
40.5.39 Connection Check
40.5.40 Self-Diagnosis
40.5.41 Battery Status
40.5.42 Present Tamper Status (PT/CT/Other)
40.5.43 First Tamper Occurrence with Date & Time
40.5.44 Last Tamper Occurrence with Date & Time
40.5.45 Last Tamper Restoration with Date & Time
40.5.46 Cover Open Information with Date & Time
40.5.47 High Resolution Cumulative Forward Active Energy (Import) (3+4 in KWh)
40.5.48 High Resolution Cumulative Forward Reactive Energy – Quadrant-(Q1-Q3) (3+4 in KVArh)
40.5.49 High Resolution Cumulative Forward Reactive Energy – Quadrant-(Q2-Q4) (3+4 in KVArh)
40.5.50 High Resolution Cumulative Forward Apparent Energy (Import) (3+4 in KVAh)
40.5.51 Present Voltage THD
40.5.52 Present Current TDD
40.5.53 Maximum Voltage THD with date & time

40.5.54 Maximum Current TDD with date & time

Net (Import-Export)

40.5.55 LCD Test
40.5.56 Smart Meter Serial Number
40.5.57 Cumulative Active Import Energy (Cumulative sign/legend must be given)
40.5.58 Cumulative Active Export Energy
40.5.59 Cumulative Reactive Energy – Quadrant-I
40.5.60 Cumulative Reactive Energy – Quadrant-II
40.5.61 Cumulative Reactive Energy – Quadrant-III
40.5.62 Cumulative Reactive Energy – Quadrant-IV
40.5.63 Cumulative Apparent Forward Energy (Active Import)
40.5.64 Cumulative Apparent Forward Energy (Active Export)
40.5.65 Apparent Forward Maximum Demand (Active Import)
40.5.66 Apparent Forward Maximum Demand (Active Export)
40.5.67 TOD wise Cumulative Active Forward Energy (Import)
40.5.68 TOD wise Cumulative Active Forward Energy (Export)
40.5.69 TOD wise Cumulative Apparent Forward Energy (Import)
40.5.70 TOD wise Cumulative Apparent Forward Energy (Export)
40.5.71 TOD wise Apparent MD (Import) with Date & Time
40.5.72 TOD wise Apparent MD (Export) with Date & Time
40.5.73 TOD wise Active MD (Import) with Date & Time
40.5.74 TOD wise Active MD (Export) with Date & Time
40.5.75 Inst. Voltages – Phase-wise (P-N)
40.5.76 Inst. Currents – Phase-wise
40.5.77 Inst Neutral Current
40.5.78 Signed Inst. Power Factor – Phase-wise
40.5.79 Inst. Net Power Factor
40.5.80 Inst. Apparent Power
40.5.81 Signed Active Power in KW
40.5.82 Signed Reactive Power in KVAR
40.5.83 Frequency
40.5.84 Cumulative Net Active Forward Import Energy
40.5.85 Cumulative Net Active Forward Export Energy
40.5.86 History 1 Cumulative Active Forward Import Energy
40.5.87 History 1 Cumulative Active Forward Export Energy
40.5.88 History 1 Cumulative Apparent Forward Import Energy
40.5.89 History 1 Cumulative Apparent Forward Export Energy
40.5.90 History 1 Apparent MD while Active Import with Date & Time
40.5.91 History 1 Apparent MD while Active Export with Date & Time
40.5.92 Cumulative Apparent MD (Import)
40.5.93 Cumulative Apparent MD (Export)
40.5.94 Last Billing Date & Time
40.5.95 History 1 Average Power Factor
40.5.96 Cumulative Billing Count
40.5.97 Cumulative Tamper Count
40.5.98 Cumulative Power Off Hours since manufacturing
40.5.99 Power **OFF** Hours of present month
40.5.100 Phase Sequence & Phase Correspondences of Voltage & Current
40.5.101 Connection Check

40.5.102 Self-Diagnosis
40.5.103 Battery Status
40.5.104 Present Tamper Status (PT/CT/Other)
40.5.105 First Tamper Occurrence with Date & Time
40.5.106 Last Tamper Occurrence with Date & Time
40.5.107 Last Tamper Restoration with Date & Time
40.5.108 Cover Open Information with Date & Time
40.5.109 High Resolution Cumulative Forward Active Energy (Import) (3+4 in KWh)
40.5.110 High Resolution Cumulative Forward Active Energy (Export) (3+4 in KWh)
40.5.111 High Resolution Cumulative Forward Reactive Energy – Quadrant-I (3+4 in KVArh)
40.5.112 High Resolution Cumulative Forward Reactive Energy – Quadrant-II (3+4 in KVArh)
40.5.113 High Resolution Cumulative Forward Reactive Energy – Quadrant-III (3+4 in KVArh)
40.5.114 High Resolution Cumulative Forward Reactive Energy – Quadrant-IV (3+4 in KVArh)
40.5.115 High Resolution Cumulative Forward Apparent Energy (Import) (3+4 in KVAh)
40.5.116 High Resolution Cumulative Forward Apparent Energy (Export) (3+4 in KVAh)
40.5.117 Present Voltage THD
40.5.118 Present Current TDD
40.5.119 Maximum Voltage THD with date & time
40.5.120 Maximum Current TDD with date & time

40.3 **TOD Wise**

40.3.1 TOD wise Cumulative Active Forward Energy (Import)
40.3.2 TOD wise Cumulative Active Forward Energy (Export)
40.3.3 TOD wise Cumulative Apparent Forward Energy (Import)
40.3.4 TOD wise Cumulative Apparent Forward Energy (Export)
40.3.5 TOD wise Apparent MD (Import) with Date & Time
40.3.6 TOD wise Apparent MD (Export) with Date & Time
40.3.7 TOD wise History 1 Cumulative Active Forward Energy (Import)
40.3.8 TOD wise History 1 Cumulative Active Forward Energy (Export)
40.3.9 TOD wise History 1 Cumulative Apparent Forward Energy (Import)
40.3.10 TOD wise History 1 Cumulative Apparent Forward Energy (Export)
40.3.11 TOD wise History 1 Apparent MD (Import) with Date & Time
40.3.12 TOD wise History 1 Apparent MD (Export) with Date & Time

Power OFF Mode Display:

Smart Energy Meter Serial No.
Real Time
Date
Cumulative Active Import Energy
Cumulative Active Export Energy
History 1 TOD wise Active import energy
History 1 TOD wise Active export energy
History 1 TOD wise Apparent import Energy
History 1 TOD wise Apparent export Energy
History 1 TOD wise Maximum Demand in Apparent while Active import
History 1 TOD wise Maximum Demand in Apparent while Active export
Cumulative Billing Count
Cumulative Tamper Count
Cover Open Information with date and time

Display for Auto and manual mode must be listed by two headers:

"Auto Display Mode"
"Push Button Mode"

Display: Other requirements:

Each parameter shall be on Smart Energy Meter display for 10 sec and the time gap between two auto display cycles shall be 20 sec.
The register shall be able to record and display starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor. The register shall not roll over in between this duration.
No decimal is required for main kWh, kVAh, kVarh (lag & lead) display.
Push button mechanism shall be of high quality and shall provide trouble free service for a long span of time.
Up and Down scrolling facility of display parameters shall be there for Push Button Mode.

41.0 For OBIS Codes of parameters, specified in this Technical Specification, other applicable standards may be referred, in case those are not available in the standards referred in this document.

TAMPER LOGIC (All tamper logic shall be provisional and can be finalized after sample testing) for **LT BULK Meter**

SI. No.	TAMPERS	Occurrence Condition	Restoration Conditions	Occurrence Time (Min/Sec)	Restoration Time (Min/Sec)
A	Import Mode:				
1	Invalid Voltage	V_{3x}> 60% V_{ref} & <115% V_{ref}	V_{3x}> 60% V_{ref} & <115% V_{ref}	min.	5 min.
		Angle difference of any two phases <±10°	Angle difference of any two phases > ±100		
2	Missing Potential	Any V_x < 30% V_{ref} other phase voltage >40% V_{ref} & <115% V_{ref}	Any V_x > 40% V_{ref} other phase voltage >40% V_{ref} & <115% V_{ref}	5 min.	5 rain.
		Current >10% I_b	Current >10% I_b		
		Missing Potential detection will be Phase wise			
3	High Voltage	Any V_x > 115% V_{ref}	V_3x < 115% V_{ref}	5 min.	5 min.
		Current ignored	Current ignored		
4	Voltage Unbalance	V_{3x} > 70% Vfef & <115% Vref	V_{3x} > 70% V_{ref} & <115% V_{ref}	5 min.	5 min.
		(Vmax — V_{min}) > 30% V_{ref}	{V_{mx}, — V_{min}} < 30% V_{ref}		
5	CT Open	$I_{Residual}$ >20% I_b	$I_{Residual}$ < 20% I_b	5 min.	5 min.
		$I_{x <}$ 2% Ib.	I_x > 2% I_b		
		Average line Current: Ignored	Average Phase Current > 10%lb		
		V_{3x} > 70% V_{ref} & <115% V_{ref}	V_{3x} > 70% V_{ref} & <115% V_{ref}		
		CT open detection will be phase wise			
6	CT Bypass	$I_{Residual}$ >20% I_b	$I_{Re.iduai}$< 20% I_b	5 min.	5 min.
		I_{3x} > 2% I_b	Phase Current Ignored		

		Average line Current: Ignored V_x 70% V_{ref} & <115% V_{ref}	Average Current>10 % I_b V_{3x} > 70% V_{ref} & <115% V_{ref}		
7	Over current	Any I_x> 150% I_{max} V_{3x}> 70% Vref & <115% Vref	I_{3x} < 150% I_{max} V_{3x} 70% Vref & <115% Vref	5 min.	5 min.
	Low PF	I_{3x} >10% Ib Average PF <0.3 V_{3x}> 70% Vref & <115% Vref	I_{3x} > 10% Ib Average PF >0.3 V_{3x} > 70% Vref & < 115% Vref	5 min.	5 min.
	Neutral Disturbance	Frequency < 45 Hz or > 55 Hz	Frequency is between >=45Hz or <=55Hz	20 Secs - 40 Secs	20 Secs -40 Secs
10	Voltage THD	When Voltage THD > 5% in any phase	When Voltage THD < 5% in all phases	5 min	5 min
11	Current TDD	When Current TDD > 5% in any phase	When Current TDD < 5% in all phases	5 min	5 min
12	Magnet	Whenever the Smart Energy Meter functionality gets affected on account of presence of any magnetic field, Smart Energy Meter shall log it as an event and start recording at Imax if does not remain immune. In Tamper Snap Shot 'max must be shown (either occurrence or restoration), with Date and Time stamp. if Smart Energy Meter detects magnetic tamper in "Export" mode, the energy increment shall be made in Import mode as per Vref, Imax and UPF.		20 Secs	20 Secs
13	Cover Open	On removal of Smart Energy Meter cover the Smart Energy Meter will log cover open event along with date and time	No restoration	Immediate	
	Since this is LT CT operated meter Residual current should take the neutral current into consideration.				
B	Export Mode				
1	Neutral Disturbance and Magnet	In Export Mode, Smart Energy Meter recording must not start at Imax. Under any circumstances, if Smart Energy Meter Logs Neutral Disturbance or Magnetic Field Tamper event and starts recording at Imax then it will log in Import Register instead of Export Register.		OEM's Choice	
2	Manual Resetting of Maximum Demand:	When Reset Button is pressed within an Integration Period, Rising Demand will not reset to Zero. The Demand will be registered for the entire Integration Period and will be logged as Current Max. Demand at the end of the Integration Period.			

Please Note:

V_{3x} = Voltage in all Phases

V_x = Voltage In any Phase

I_{3x} = Current in all Phases

$\mathbf{I}_x$ = Current in any phase

Problems and avoid penalties that can be imposed by electrical utilities. More information about the levels of harmonic can be found on the IEEE website.

(B) 3-phase whole current import-export meter having current rating of 20-100 A:

1.0 SCOPE

This scope covers design, engineering, manufacture, testing, inspection and supply of AC 3 Phase 4 Wire 240V LT Solid State (Static) Whole Current Import – Export Energy Meter of 1.0 Class Accuracy and 5-30A Current Rating with backlit LCD display used for balanced/unbalanced load in urban /rural area. The meter shall be capable of recording and displaying energy in KWh & demand in KVA, power factor having the range of zero lag-unity-zero lead. Meter shall have facility /capability of recording tamper information & load survey of active energy (both import & export), apparent energy, reactive energy, phase currents, Phase Voltages & Other parameters in non-volatile memory.

It is not the intent to specify completely herein all the details of the design and construction of meter. However, the meter shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing commercial operation continuously in a manner acceptable to WBSEDCL, who will interpret the meanings of drawings &specification and shall have the right to reject any work or material which in its judgment is not in accordance herewith. The meter shall be complete with all components, accessories necessary for their effective and trouble-free operation for the purpose mentioned above. Such components shall be deemed to be within the scope of bidder's supply irrespective of whether those are specifically mentioned or not in this specification or in the commercial order.

2.0 STANDARDS APPLICABLE: Unless specified elsewhere in this specification, the performance & testing of the meters shall conform to the following Indian / International standards, to be read with up-to-date and latest amendments / revisions thereof as on 90 days prior to floating of tender.

Sl. No.	Standard No.	Title
1	IS13779:1999 read with its latest amendments	Specification of AC Static Watt Hour meters, Class 1.0 and 2.0
2	CBIP Report No. 325 & its latestamendments, if any	Specification for AC Static Electrical Energy Meters
3	IS 12346 :1988	Specification for testing equipment for AC Static Electrical Energy Meter (latest amendment)
4	IEC687 – 1992	Specification of AC Static Watt Hour meters for active energy (Class 1.0)
5	CBIP Technical Report III	Specification for Common Meter Reading Instrument

3.0 CLIMATIC CONDITIONS:

The smart meters to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions. Meters shall be capable of maintaining required accuracy under hot, tropical and dusty climatic conditions. The meters shall be suitably designed and treated for normal life and satisfactory operation under hot and hazardous tropical climatic conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish which provides suitable protection to them from any injurious effect of excessive humidity.

Maximum Ambient Air Temperature in shade: 55^0 C
Minimum Ambient Air Temperature: (-)10^0 C
Maximum Relative Humidity: 95%(non-condensing)
Minimum Relative Humidity: 10%
Height above mean sea level: Up to 3000 meters
Average number of tropical monsoons per annum: 5 months
Annual Rainfall: 100 mm to 1500 mm
Maximum Wind Pressure: 150 Kg/Sqm

4.0 SUPPLY SYSTEM:

System	3 Phase 4 Wire
Rated voltage (V_{ref})	240 V – Phase to Neutral, 415 V – Phase to Phase
Rated Current	Basic current 20 Amps (I_b), Maximum current 100 Amps (I_{max})
Rated Frequency	50 Hz

5.0 POWER FACTOR RANGE: The meter shall be lag only in import mode suitable for full power factor range from zero (lagging) through unity to zero (leading).

6.0 POWER SUPPLY VARIATION: The meter shall be suitable for working with following supply system variations.

System	3 Phase 4 Wire
Specified range of operation	70% to 120% of reference Voltage i.e. 240 Volt
Frequency	50Hz ±5%

7.0 ACCURACY

Class of accuracy of the meter shall be 1.0.

Maximum error limit at 1% & 2% Ib and UPF shall not exceed ±2% in Import Mode. For Export Mode relevant IS is to be followed.

There shall be no drift in accuracy, at least for a period of ten years from the date of supply.

In case any drift is noticed which is beyond the permissible limits, the bidder shall have to replace the meter with a new one free of cost.

8.0 POWER CONSUMPTION

Voltage Circuit: The active and apparent power consumption in the voltage circuit/phase at reference voltage, reference temperature and reference frequency shall be less than 1.5W / 10VA as per IS 13779.

Current Circuit: The apparent power taken by current circuit/phase at basic current, reference frequency and reference temperature shall be less than 4 VA as per IS 13779.

9.0 STARTING CURRENT & RUNNING AT NO LOAD

The meter shall start registering energy at 0.2% of basic current at unity power factor and shall be fully functional within five seconds after the rated voltage is applied.

Running at no load: When 70% & 120% voltage is applied and no current flows in the current circuit, the test output of the meter shall not produce more than one pulse.

10.0 MAXIMUM CONTINUOUS CURRENT:

The maximum continuous current in meters shall be the current at which the meter purports to meet the accuracy requirement of the specification. The same is indicated in table in Supply System Clause of this specification.

11.0 CONSTRUCTION:

11.1 The case, winding, voltage circuit, sealing arrangements, registers, terminal block, terminal cover & name plate etc. shall be in accordance with the relevant standards. The meter shall be compact & reliable in design, easy to transport & immune to vibration & shock involved in the transportation & handling. The construction of the meter shall ensure consistence performance under all conditions especially during heavy rains / very hot weathers. The insulating materials used in the meter shall be non-hygroscopic, non-ageing & have tested quality. The meter shall be sealed in such a way that the internal parts of the meter becomes inaccessible and attempts to open the meter shall result in viable damage to the meter cover i.e. break to open type. This is to be achieved by using continuous Ultrasonic welding on all the four sides of the Meter base and cover or any other technology which is either equally or more efficacious.

11.2 The meter shall comply latest technology such as Microcircuit or Application Specific Integrated Circuit (ASIC) to ensure reliable performance. The mounting of the components onthe PCB shall compulsorily be Surface Mounted Technology (SMT) type. Power supply component may be of PTH type. The electronic components used in the meter shall be of high quality and there shall be no drift in the accuracy of the meter for at least ten years. The circuitry of the meter shall be compatible with 16 Bit (or better) ASIC with compatible processor and meter shall be based on Digital measuring and sampling technique.

11.3 The Smart Meter shall be housed in a safe, high grade, unbreakable, fire resistant, UV stabilized, virgin Polycarbonate casing of projection mounting type. The Smart Meter cover shall be transparent / translucent/ opaque. But the viewing portion shall be transparent for easy reading of displayed parameters, and observation of operation indicators. The Smart Meter base may not be transparent, but it shall not be black in colour. The Smart Meter casing shall not change in shape, colour, size and dimensions when subjected to 72hrs on UV test as per ASTMD 53. It shall withstand 650 deg.C. glow wire test and heat deflection test as per ISO 75 or as per IEC 60068 -2-5.

11.4 In addition to the above, the Smart Meter cover shall be sealable to the Smart Meter base with at least 2 nos. bar coded seals bearing the identification marks of the Manufacturer. Suitable arrangement shall be made for fitting/fixing of utility seal at two sides of Smart Meter terminal cover in such a manner that any access to the terminal cannot be made possible without removing the seal. There shall also be provision for sealing at the optical port & terminal cover.

11.5 The polycarbonate material of only the following manufacturers shall be used:

G.E. Plastic: LEXAN 943A or equivalent like 943, 123R for meter cover & terminal cover / LEXAN 503R or equivalent like 500, 143R for meter base and terminal block.
BAYER: Grade corresponding to above
DOW Chemical: --do--
MITSUBISHI: --do--
TEJIN: --do--
DUPONT: --do—

12.0 SMART METER CASE AND COVER:

12.1 In case, ultrasonic welding using plate / strip is used, the material of plate / strip shall be same as that of cover and base and the strip. The manufacturer's logo shall be embossed on the strip / plate. The material of the meter body (case and cover) shall be of Engineering Plastic.

12.2 The meter cover shall be fixed to the meter base (case) with Unidirectional Screws, so that the same cannot be opened by use of screwdrivers. These unidirectional screws shall be covered with transparent caps (not required for screw less design), ultrasonically welded with the meter body and the screw covers shall be embedded in the meter body in a groove. The meter shall withstandexternal magnetic influence as per latest amendments of CBIP Technical Report No.325 including 0.2T AC Magnet, 0.5T Permanent magnet.

13.0 TERMINAL BLOCK AND COVER:

13.1 The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block shall be made from best quality non-hygroscopic, flame retardant material (capable of passing the flammability tests) with nickel plated brass inserts / alloy inserts for connecting terminals. It shall be rigidly fixed to the base of the meter so that it cannot be separated from the meter base without breaking either the meter base or the terminal block and this fixing arrangement shall be in parallel to the meter base in such a way that itcannot be viewed or approached from any part of the meter without breaking the meter.

13.2 The terminals in the terminal block shall be of adequate length in order to have proper grip of conductor. The screws shall have thread size not less than M4 and head having 6 mm. Diameters. The screws shall not have pointed ends at the end of threads. All terminals and connecting screws and washers shall be of tinned / nickel plated brass material. The terminal shall withstand glow wire test at 960 + 15 ºC and the terminal shall withstand at least 135 ºC.as per IS.

13.3 The internal diameter of terminal hole shall be minimum 9.5 mm and center to center distance is 13 mm. The holes in the insulating material shall be of sufficient size to accommodate the insulation of conductor also.

13.4 The terminal cover shall be transparent re-enforced Polycarbonate, Engineering Plastic with minimum thickness 2.0 mm and the terminal cover shall be of extended type completely covering the terminal block and fixing holes. The space inside the terminal cover shall be sufficient to accommodate adequate length of external cables.

13.5 The terminals and all connecting screws will be of suitable material capable of withstanding a current of 120% of I_{max} for two hours, continuously and the meter shall be capable of providing phase to neutral protection up to 433 V for 1(one) hours.

14.0 MARKING OF THE SMART METER:

Manufacturer's name & trade mark
Type Designation
No. of phases & wires
Serial number (Size not less than 5mm)
Month & year of manufacture
Reference Voltage
Rated Current
Operating Frequency
Principal unit(s) of measurement
Meter Constant (imp/kwh)

Class index of meter
"Property of WBSEDCL"
Purchase Order No. & Date
Guarantee (Guaranteed for a period of 5 ½ years from the date of delivery)
BIS marking
Place of manufacture
Barcode for meter serial no. in alpha numeric form, date of manufacture, current rating of the meter and PO reference, readable by single layer barcode reader.
The reference temperature if different from 27°C.
The sign of Double Square for insulating encased meters.

15.0 CONNECTION DIAGRAM AND TERMINAL MARKING: Every meter shall be indelibly marked with a diagram of connection. For this poly phase meters, this diagram shall also show the phase sequence forwhich the meter is intended. It is permissible to indicate the connection diagram by an identification figure in accordance with relevant standards. The marking of meter terminals shall appear on this diagram.

16.0 DISPLAY OF MEASURED VALUES:

16.1 The meter shall have alphanumeric display with at least 7 full digits with LCD backlit display, having minimum character height of 10 mm. The data shall be stored in nonvolatile memory. The non-volatile memory shall retain data for a period of not less than 10 years under unpowered condition. Battery back-up memory will not be considered as NVM.

16.2 It shall be possible to easily identify the single or multiple displayed parameters through symbols / legend on the meter display itself or through display annunciation which shall be self-explanatory and symmetric.

16.3 In addition to provide Serial Number of the meter on the display plate, the meter serial no. shall also be programmed into meter memory for identification through communication port for CMRI / laptop / meter reading printout.

16.4 Visibility of display in poor light conditions is an important criterion. STN or TN or any better type of advanced LCD to be used. Proper legends for the displayed parameters to be provided (Factory programmable). Back lit provided for clear visibility shall be uniform throughout all part of the LCD.

16.5 The meters shall have auto-display mode for pre-selected parameters. Push-Button mode of display shall display all parameters and it shall have priority over auto mode. The meter shall give clear message on display to indicate that the meter has experienced tampers and the nature of tamper with date and time of first occurrence, last occurrence and last restoration, if the Last tamper status is not restored, then meter will indicate first occurrence, lastrestoration and last occurrence.

16.6 Connection check, Phase sequence and self-diagnostic shall give clear message on display. Themeter shall have a test output **(**blinking **LED)** accessible from the front and be

capable of being monitored with suitable testing equipment. The operation indicator must be visible from the front. Test output device shall be provided in the form of one common LED for active and reactive energy with the provision of selecting the parameter being tested (separate LED may also be used with proper separation).

17.0 DISPLAY SEQUENCE: The Smart Meter shall display the required parameters in two different modes as follows. Display sequence for both auto and Push button must be maintained, no interchange in sequence or display parameter will be accepted. All the display shall have proper legend to identify the same. All the display parameters like auto and push will come under push method. The display logic and parameters as followed are provisional and subject to change after sample testing/firm order. The provision for necessary alteration of display parameters may be made available by the respective manufacturer.

17.1 Auto Display Mode: The following parameters shall be displayed in auto cycle mode, in thefollowing sequence.

17.1.1 LCD test
17.1.2 Meter serial number
17.1.3 Real Date (dd mm yy)
17.1.4 Real Time (hh mm ss)
17.1.5 Cumulative Active Import Energy
17.1.6 Cumulative Active Export Energy
17.1.7 Instantaneous Phase Voltages
17.1.8 Instantaneous Phase Currents
17.1.9 Instantaneous Neutral Current
17.1.10 History1 Cumulative Active Import Energy (up to 24:00 hrs. of last day of last month).
17.1.11 History1 Cumulative Active Export Energy (do)
17.1.12 History 1 Power Factor
17.1.13 History 1 MD KVA (Import)
17.1.14 History 1 MDKVA (Export)
17.1.15 Cumulative Billing Count
17.1.16 Cumulative Tamper Count
17.1.17 Cover Open Information with date and time

17.2 Push Button mode: In addition to the auto display mode parameters, the following parameters shall be displayed on pressing the push button i.e. all display of auto mode and the display as per following.

17.2.1 LCD test
17.2.2 Meter serial number
17.2.3 Real Date (dd mm yy)

17.2.4 Real Time (hh mm ss)
17.2.5 Rising Demand (both import and export) in KVA with elapsed time. (Should get refreshed without delay)
17.2.6 Voltage Phase Sequence
17.2.7 Current Phase Sequence
17.2.8 Cumulative Active Import Energy
17.2.9 Cumulative Active Export Energy
17.2.10 Cumulative Apparent Import Energy
17.2.11 Cumulative Apparent Export Energy
17.2.12 Maximum Demand in Active Import with date & time
17.2.13 Maximum Demand in Active Export with date & time
17.2.14 Maximum Apparent Demand While Active Import with date & time
17.2.15 Maximum Apparent Demand While Active Export with date & time
17.2.16 Cumulative Reactive Import while Active Import Energy
17.2.17 Cumulative Reactive Import while Active Export Energy
17.2.18 Cumulative Reactive Export while Active Import Energy
17.2.19 Cumulative Reactive Export while Active Export Energy
17.2.20 R Phase to Neutral Voltage
17.2.21 Y Phase to Neutral Voltage
17.2.22 B Phase to Neutral Voltage
17.2.23 R Phase Current
17.2.24 Y Phase Current
17.2.25 B Phase Current
17.2.26 Neutral Current
17.2.27 Inst. Power Factor – Phase Wise
17.2.28 Instantaneous Average Power Factor
17.2.29 Instantaneous Active Power (Export or Import with proper sign/indication)
17.2.30 Instantaneous Apparent Power (Export or Import with proper sign/indication)
17.2.31 TOD Active Energy Import
17.2.32 TOD Active Energy Export
17.2.33 TOD Apparent Energy while Active Import
17.2.34 TOD Apparent Energy while Active Export
17.2.35 TOD Reactive Import while Active Import Energy
17.2.36 TOD Reactive Import while Active Export Energy
17.2.37 TOD Reactive Export while Active Import Energy
17.2.38 TOD Reactive Export while Active Export Energy
17.2.39 History 1 TOD wise Active import energy
17.2.40 History 1 TOD wise Active export energy
17.2.41 History 1 TOD wise Apparent import Energy

17.2.42 History 1 TOD wise Apparent export Energy
17.2.43 History 1 TOD wise Maximum Demand in Apparent while Active import
17.2.44 History 1 Maximum demand in Apparent while Active import Occurrence Time and Date
17.2.45 History 1 TOD wise Maximum Demand in Apparent while Active export
17.2.46 History 1 Maximum demand in Apparent while Active export Occurrence Time and Date
17.2.47 History 1 Maximum demand in Active import
17.2.48 History 1 Maximum demand in Active import Occurrence Time and Date
17.2.49 History 1 Maximum demand in Active export
17.2.50 History 1 Maximum demand in Active export Occurrence Time and Date
17.2.51 History 1 Reactive import while active import energy
17.2.52 History 1 Reactive import while active export energy
17.2.53 History 1 Reactive export while active import energy
17.2.54 History 1 Reactive export while active export energy
17.2.55 Cover Open Information with date and time
17.2.56 Cumulative Power OFF Hours in hour: minute from the date of manufacturing.
17.2.57 Power OFF Hours of present month
17.2.58 Average Power Factor (Previous Month)
17.2.59 Avg. Load Factor (Previous Month)
17.2.60 Instantaneous Frequency
17.2.61 Present Tamper Status (PT/CT/Others)
17.2.62 First Occurrence with Date & Time
17.2.63 Last Occurrence with Date & Time
17.2.64 Last Restoration with Date & time
17.2.65 Cumulative Tamper Count
17.2.66 High resolution display both Import & Export for kWh, kVArh (Lag + Lead) andkVAh (minimum 2+4)
17.2.67 High resolution display both for Import & Export for kWh, Phase wise (minimum2+4)
17.2.68 Connection check (when all phases are forward or reverse)
17.2.69 Self-Diagnosis
17.2.70 Battery Status

17.3 Power OFF Mode Display:

17.3.1 Meter Serial No.
17.3.2 Real Time
17.3.3 Date
17.3.4 Cumulative Active Import Energy
17.3.5 Cumulative Active Export Energy

17.3.6 History1 Cumulative Active Import Energy (up to 24:00hrs of last day of last month)
17.3.7 History1 Cumulative Active Export Energy (do)
17.3.8 History 1 KVA (Import)
17.3.9 History 1 KVA (Export)
17.3.10 History 1 TOD wise KWh (Import)
17.3.11 History 1 TOD wise KWh (Export)
17.3.12 History 1 TOD wise KVAh (Import)
17.3.13 History 1 TOD wise KVAh (Export)
17.3.14 Cumulative Billing Count
17.3.15 Cumulative Tamper Count

Display for Auto and manual mode must be listed by two headers:
"Auto Display Mode"
"Push Button Mode" (Parameters shall be pasted in front of the PP Box**)**

18.0 Display: Other requirements:

18.1 Each parameter shall be on meter display for 10 second the time gap between two auto display cycles shall be 30 sec.
18.2 The register shall be able to record and display starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor. The register shall not roll over in between thisduration.
18.3 High resolution display can be given in separate mode and its registers required in display min 2+4 digits (for kWh) after decimal in case of Energy.
18.4 No decimal is required for main KWh, KVAh, KVarh (lag & lead) display.
18.5 Push button mechanism shall be of high quality and shall provide trouble free service for a long span of time.
18.6 Up and Down scrolling facility shall be there for Push Button Mode.

Besides other details the following parameters shall be available in BCS throughdownloaded data.
History 1 TOD wise KWh (Import)
History 1 TOD wise KWh (Export)
History 1 TOD wise KVAh (Import)
History 1 TOD wise KVAh (Export)
History 1 TOD wise MD in KVA (Import)
History 1 TOD wise MD in KVA (Export)
TOD Wise Cumulative Active Forwarded Energy both import & Export (up to date Zone 1, 2, 3)
TOD Wise Cumulative Apparent Energy both import & Export (up to date Zone

1,2,3)

Cumulative Active and Apparent Demand (both Import and Export) may be available at BCS end

19.0 ANTI TAMPER FEATURES: The meter shall have the following anti-tamper features:

19.1 The meter shall be capable of recording energy correctly at Import as well as Export mode. If any phase current flows in forward direction, the meter shall register energy in phase-wise Import counter as well as in cumulative Import counter and if phase current flows in reverse direction, it shall register energy in phase-wise Export counter as well as in cumulative Exportcounter. Simultaneous Import & Export in different phases shall be allowed and this will not be treated as any Tamper event.

19.2 The meter shall work correctly irrespective of phase sequence of supply. (There must be an indication in display & down loaded data).

19.3 The meter shall work correctly even in absence of neutral as per IS13779. For reference voltage Vref between 70% to 50 %, accuracy must be maintained within ±4%.

19.4 Meter shall record energy within maximum error of + 4% on injection of DC, pulsating DC (7- 10 Hz), chopped AC in Neutral along with logging of ND tamper. In case tamper event is not logged, i.e., meters are immune to neutral disturbance, accuracy of the meters must not be affected. Maximum chopping for AC injection will be 25% to 30% at peak end.

19.5 The registration shall not be affected more than + 4% if high frequency (55Hz to 100Hz) orlow frequency (45 Hz to 30 Hz) AC signal w.r.t. earth is applied to the meter neutral. Meters which are immune or will maintain better accuracy, will be preferred.

19.6 The meter shall be immune to Electro Static Discharge or Sparks of 35 KV (approx..) induced byusing frequency-generating devices having very high output voltage.

Tests in this respect will be conducted by using commonly available devices and during spark discharge test, spark will be applied directly at all vulnerable points of the meter for a period of 10 minutes (at an interval of 1minute (approx..) between two consecutive strokes) and meter shall maintain accuracy after the test under this condition. Accuracy will be checked during and after application of spark discharge Test. Meter shall record correctly within the specified limits of errors. Beyond 35 KV, the meter shall record tamper if not immune.

19.7 The meter shall be capable of recording occurrence and restoration with date

and time in respect to the following tamper events:

Power failure (Tamper count not to be increased) - as per tamper logic 1(i)
Invalid Voltage- as per tamper logic 2(i)
Missing Potential (phase wise) —as per tamper logic 2(ii)
High Voltage – as per tamper logic 2(iii)
Voltage Unbalance – as per tamper logic 2(iv)
Phase wise CT Open- as per tamper logic 3(i)
CT Unbalance - as per tamper logic 3(iii)
Over Current - as per tamper logic 3(iv)
Neutral Disturbances (If it is logged) - as per tamper logic 4(ii)
Magnetic Disturbances - as per tamper logic 4(iii)

19.8 Threshold Values of all above occurrence and restoration are attached herewith. Snapshot values of Phase Voltage, Phase Current &Phase wise Power Factor, Active Energy valueduring occurrence & restoration to be provided in all the above-mentioned tamper conditions in BCS with date and time. (In Event logging Snapshots shall be considered when the actual phenomenon occurred). The logging time for recording occurrence and restoration of all tamper events except Magnetic & Neutral Disturbance tamper, shall be 5 min. Magnetic tamper shall appear instantaneously, Neutral Disturbance within 3 min.

19.9 All authenticated commands shall be Base Computer Software (BCS) controlled. All transactions with meter shall be date and time logged, in the downloaded data (Last 12 month's transactions).

19.10 Properly designed meter tamper logic shall be provided and clearly explained in the bid. The tamper logic shall be capable of discriminating the system abnormalities from source side andload side and it shall not log/record tamper due to any source side abnormalities. More than one tamper *CT related/ PT related/ others* shall not be logged at a time. A minimum of 300 events (one event means either occurrence or restoration) of all types of tamper with date & time stamping shall be available in meter memory compartment wise. The logging will be on FIFO basis. The events will be divided into three compartments like *CT related (148 Events),PT related (88 Events) and others (64 Events)*.

19.11 Meter shall have a continuous and clear indication in its display if top cover is removed / opened and even re-fixed (non-rollover) and only cover open must be logged in BCS without any restoration. COVER OPEN tamper is to be displayed after every parameter displayed in Auto Display Mode.

Measurement of Harmonics: The meter shall be capable of measuring fundamental energy aswell total energy i.e., fundamental plus harmonics energy. Total energy shall be made available on meter display and the same shall be used for billing purpose. Provision for measuring fundamental energy shall be kept for utilization in future. The total energy and fundamental energy shall be logged in the meter memory and be capable of downloading to the BCS through the CMRI and be available for viewing at the BCS end separately.

20.0 RESETTING OF MAX. DEMAND:

20.1 The meter shall be capable of recording the Apparent MD with integration period of 15 minutes (programmable). MD reset shall be through each of the three means:

- Automatic resetting at preset date & time (at present it will be at 00.00 hrs. of thefirst day of the month)
- Manually i.e., by push button.
- Through authenticated command from MRI or through Remote Communication.

20.2 The means by which the reset has been done shall be made available to downloaded data. Facility to invoke any of the above through authenticated MRI command shall be provided at BCS. MD reset button shall have proper sealing arrangement.

20.3 There shall be separate Push button for scrolling display (up and down) and MD reset. If only two Push buttons are used minimum 20 sec pressing is required for MD reset.

21.0 LOAD SURVEY: The meter shall be capable of recording load survey for the following parameters fora period of minimum 60 days - subject to availability of all parameters listed below with 15 minutes integration period.

Energy in KWh &KVAh, (Import & Export mode shall be shown clearly)
Demand in KVA and KW, (Import & Export mode shall be shown clearly)
Current – phase-wise
Voltage – phase-wise

22.0 The NVM shall not require any additional battery backup to retain the data in case of power failure, for up to 10 years and the data storage shall be independent of battery backup unit. The life of the RTC battery in circuit condition shall be minimum 10 years in case of power failure. It shall be possible to transfer this data to base computer software through MRI/Laptop or RMR. The data so obtained shall be displayed in both graphical &numeric form in the BCS. The BCS with all details is to be provided by the supplier at no extra cost.

23.0 TIME OF DAY FACILITIES: The meter shall have facilities to record Active, Apparent Energies and MD in at least 8 zones. The time zones shall be user programmable through authenticated MRI/Laptop/RMR command. Necessary

software for the same is to be provided by the bidder. At present TOD timings will be programmable as follows:

23.1 TOD 1: 06:00 Hrs. to 17:00 Hrs.
23.2 TOD 2: 17:00 Hrs. to 23:00 Hrs.
23.3 TOD 3: 23:00 Hrs. to 06:00 Hrs.

24.0 METER READING DURING POWER OFF: It shall be possible to read the meter-display visually and with MRI/Lap top in absence of input voltages with the help of internal battery backup. In case of external battery, the arrangements shall be such that hands-free operation is possible. In case of external battery 10 years guarantee must be given for external battery/power pack. Separate battery shall be used for this purpose (Not RTC or processor battery). In case of Lithium battery rating shall be more than 500 mAh.

25.0 SELF DIAGNOSTIC FEATURES: The meter shall be capable of performing complete self-diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data memory location all the time. If possible, the details of malfunctioning shall be recorded in the meter memory. The bidder shall furnish the details of self-diagnostic capability feature, viz Memory status (NVM) and Battery status, RTC Status etc. and it shall be in display.

26.0 IMMUNITY TO ELECTRO MAGNETIC DISTURBANCE: The meter shall be designed in such a way so that external electromagnetic field or electrostatic discharges do not influence the performance of the meter as per IS 13779.

27.0 TECHNICAL SUPPORT, MANUALS &TRAINING: Extensive technical support, detailed technical literature (shall supply with each meter at the time of packing) & training is to be provided by the manufacturer. Supply of External Battery Packs if required to be provided by the manufacturer and shall be clearly offered in their bids.

28.0 INFLUENCE QUANTITIES: The meter shall work satisfactory with guaranteed accuracy as per limit provided in IS: 13779 (clause No.9.2.1 and 11.2) under presence of the following quantities:

Electromagnetic field
External magnetic field
Radio frequency interference
Vibration
Voltage variation (70% - 120% of Vref.) in 0.5 lag and upf both in 5% and 100% of I_b
Frequency variation (+/-) 5% of 50 Hz in 0.5 lag and upf both in 5% and 100% of I_b

29.0 COMMUNICATION CAPABILITY:

29.1 **The Smart Meters will have the capability on smart features with GPRS Connectivity under the scope of IS 16444 Part II/15959.**

29.2 The Smart Meter shall have a galvanic isolated Optical Port as per IEC 1107/ANSI/PACT so that it can be easily connected to a Mobile phone Smart Meter reading app-based application for data transfer.

29.3 The optical port shall be provided with proper sealing arrangement so that its cover can't be opened without breaking its seal. In case sealing arrangement is not there, access through authentication shall have to be ensured.

29.4 A Serial Port (RS485 or **RJ11)** may be provided inside the terminal cover and shall be optional to enable automatic Smart Meter reading through modem, if required in future. This Serial Port shall be housed inside the Smart Meter terminal cover so that it can't accessed without opening the sealed terminal cover.

29.5 The stored data in the Smart Meter shall be available through Laptop even when the display of the Smart Meter is not available.

29.6 Date in the Smart Meter shall be reset only through commands from the Laptop. Correction of RTC time, change of TOD timings etc. shall be done through Laptop utilizing authenticated command set by BCS AND HES.

29.7 Billing parameters shall be factory programmable.

29.8 Meter shall have ability to communicate with HES on any one of the technologies mentioned in IS 16444 (RF/Cellular/PLC) in a secure manner. For this project only, cellular based communication shall be used and the meter shall preferably accommodate dual SIM Card or e-SIM of any Telecom Service Provider to meet the Service Level Agreements (SLAs). The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

29.9 Plug-in Communication Module (NIC): The smart meter shall have a dedicated sealable slot for accommodating plug-in type bi-directional communication module which shall integrate the Cellular communication technology with the smart meter and act as interface between the meter and HES. The Plug-In module shall preferably be field swappable/replaceable and may be with the same make.

29.10 Integration: The bidder must ensure bi-directional data communication between the meter and HES for cellular communication technology.

29.11 Software and support:

1. The bidder shall supply following software and provide required training & manuals to use the same free of cost. Software for local communication, i.e., for Mobile App, Laptop and PC. This software shall be compatible with Android (11.0 and above) or Windows OS (10 and above), whichever is applicable. Software for firmware upgrading from remote-end mass deployment.

2. Bidder shall ensure integration of software with any of WBSEDCL system during the life of meter free of cost. WBSEDCL will provide all the required support for integration activity.

3. The bidder shall have to ensure DLMS compliance of the meter for both local & remote communication through its Optical port and NIC card.

29.12 Software for local communication: The manufacturer has to provide software capable of downloading all the data stored in meter memory through Mobile app, Laptop and PC. The manufacturer shall also provide software for Android and Windows devices. The bidder has to ensure that all required reading and diagnostic tools are available with them to ensure SLA as mentioned in Tender. Specification and costing of these tools shall be shared with WBSEDCL incase WBSEDCL wants to maintain their own devices.

29.13 Meter data for manual collection through mobile app: In case the meter data is not received through AMI, the manual meter reading data using mobile devices through the meter reading app shall be directly uploaded to the HES.

29.14 Training: Manufacturer shall impart training to WBSEDCL personnel for usage of software.

29.15 Port protection: All ports shall be optically isolated from the power circuit.

27.16 Operation: Optical port and NIC Card shall work independently. Failure of one (including display) shall not affect the working of the other.

29.17 Communication protocol: As per IS-15959 (Part3) as applicable.

29.18 Data transfer rate: Communication ports shall have to support data transfer rate of 9600 Bps (minimum)

29.19 Data Security: Advanced Security outlined in clause 7.1.2 of IS-15959 (Part1)

29.20 Encryption for data communication: As per clause 7.1 of IS15959 (Part2)

29.21 Encryption/ Authentication For data transport: As per clause7.2 of IS15959 (Part2)

29.22 Key requirements and handling: As per clause 7.3 of IS15959 (Part2)

29.23 IP communication profile support: As per clause 8 of IS 15959 (Part2).

Note: Meter shall support TCP-UDP/ IP communication profile for smart meter to HES.

29.24 Antenna port: The meter should have a port for connecting external antenna of strength 5 dBi or more in case the signal strength of the SIMs is poor. The antenna shall be supplied by the manufacturer for this scenario.

30.0 General requirement for communication module for Smart Meters

The communication module for smart meter may be of the same make of the meter. This shall be applicable on all relevant clauses of the communication module of the NIT.

The design and the pin configuration specified in the tender shall be indicative and shown for representational purpose only. Manufacturer design may be accepted.

Part I

1. Recommended Module Placement location: In order to improve the performances of Cellular technologies encompassing, it is recommended to place the communication module anywhere on the accessible part of the meter. This will also enable an easy approach to improve antennae performances.

2. Meter shall have the means of tamper detection to record the event(s) of the removal of the communication module set from the meter, irrespective of whether the meter is in power on (has supply) or powered off (no supply) condition.

3. The Module shall be hot swappable and shall fit snugly inside the meter box, so that the same IP class of the meter is maintained.

4. A transparent cover may be used for the purpose,

a. To have a sealing arrangement with the meter body as well as,

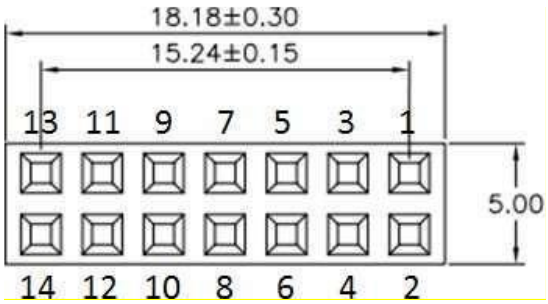
b. For easy viewing of LED indicators and antenna assembly without having to open the cover.

Part II

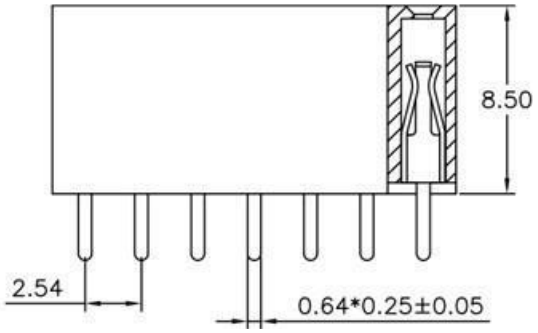
Communication interface: The meter shall have a slot of an appropriate size to allow for the pluggable communication to be fit in to the meter. The meter shall provide a 14-pins Female socket connector (2*7 pin, 2.54 mm). The socket shall be selected and positioned to ensure that the male pins on the communication module can connect reliably and easily connect with the female contactors on the meter.

Female connector

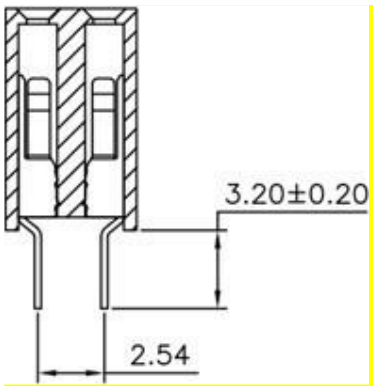
1. Front View：



2. Top View:



3. Side View:



PIN Outs may be provided as per below details:

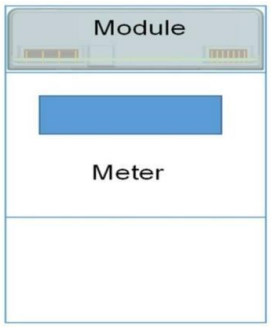
Pin No	Name	Input/output	Description
1	Reserved	/	/
2	Reserved	/	/
3	Power EN	Output	Control the module's power supply
4	Reserved	/	/
5	Reserved	/	/
6	Meter TXD	Output	To Module UART port RXD, Min.38400
7	Meter RXD	Input	From Module UART port TXD, Min.38400
8	Reserved	/	/
9	RTS	Input	Input digital signal from module
10	RST	Output	Reset signal for module
11	CTS	Output	Output digital signal to module
12	+Vdc	Power	As per IS16444
13	GND	Common	Ground Reference Potential
14	GND	Common	Ground Reference Potential

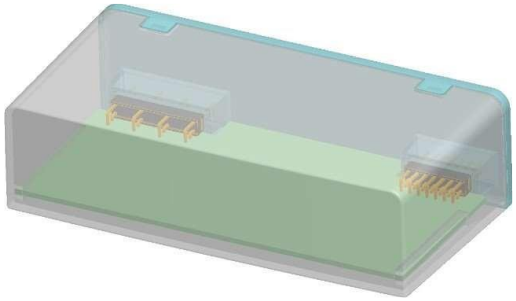
Part III

The following reference size may be adhered to irrespective of a single or multiple communication options provisioned on the same module. This standard form factor and dimensions will enable physical and functional interoperability with different makes of meters.

B. Module 3-D views (For Representational Purpose Only)

1. Module in meter (Top View) 2. 3D View



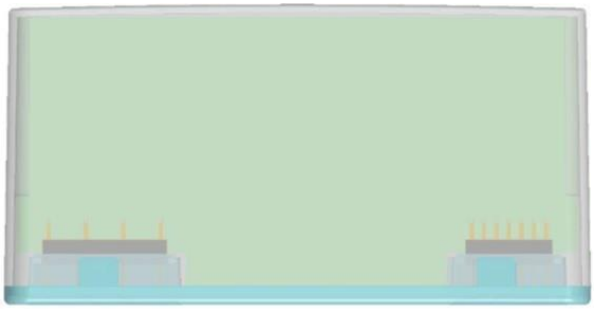


3. Front View

4. Back View

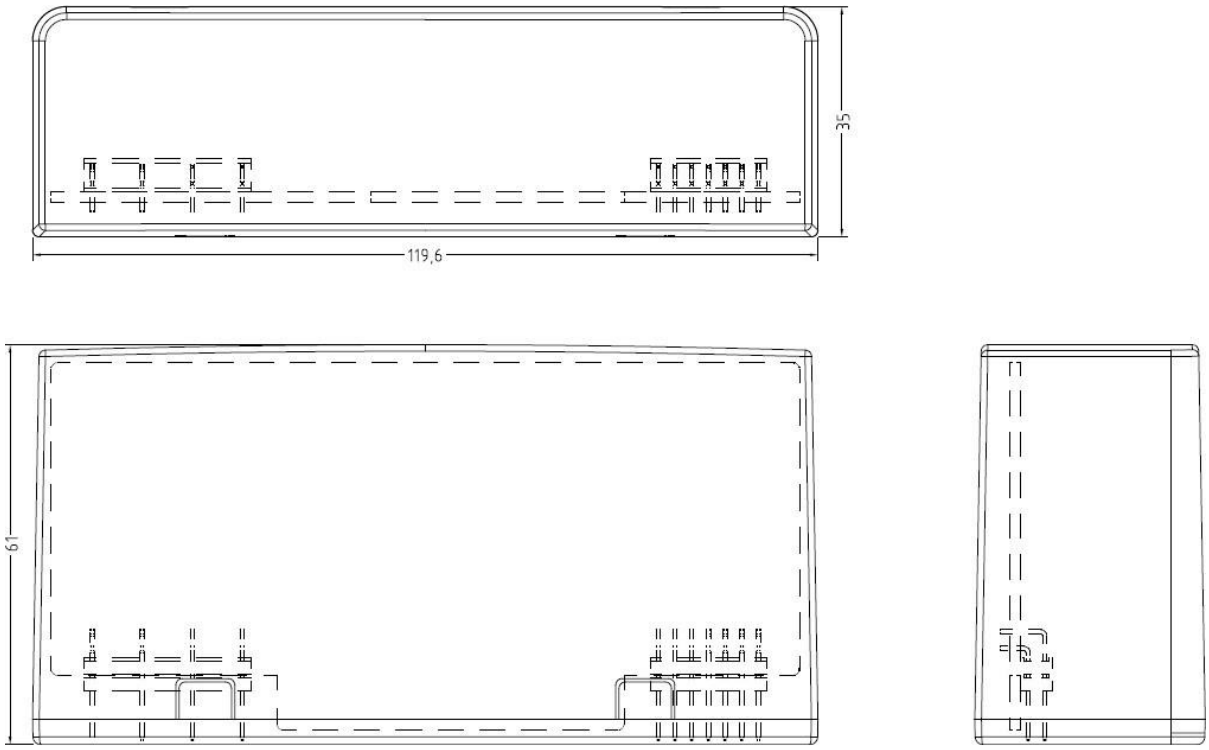
5. Side View

6. Top View

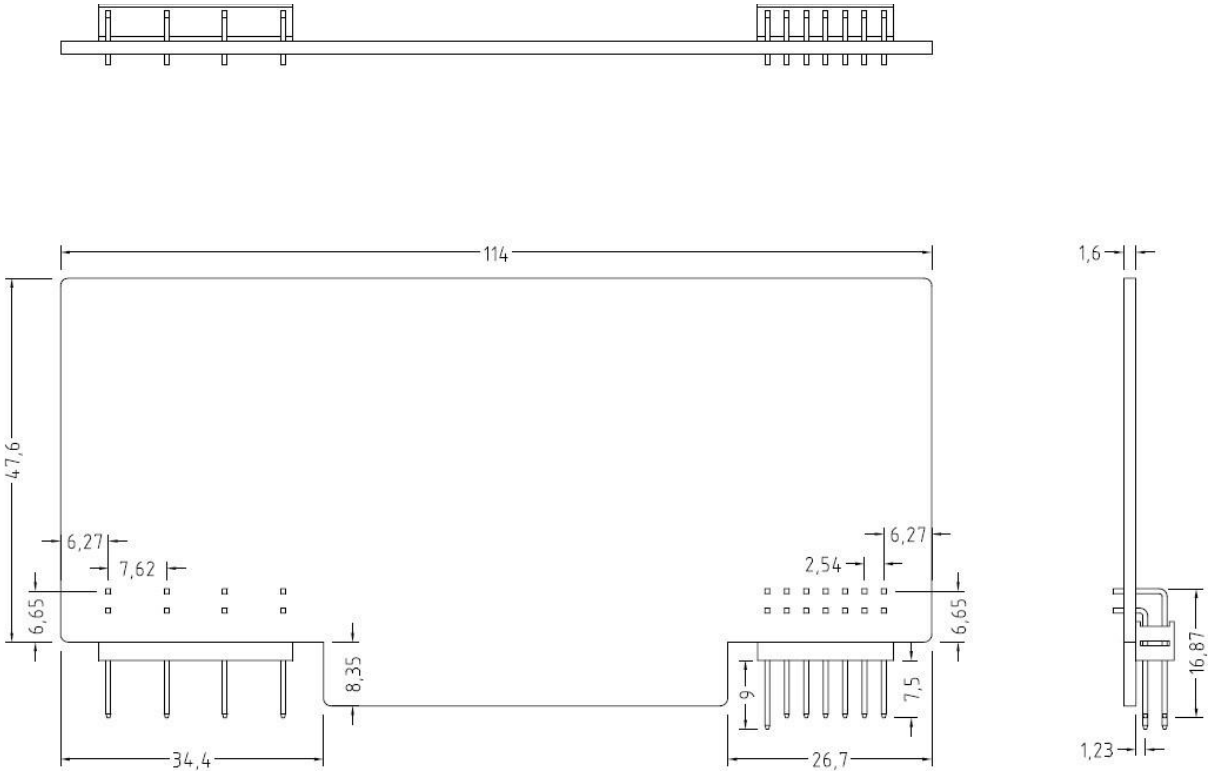


7.Bottom View

B. Module Dimensions



D. Overall view of the module's PCBA:



Notes: **Module** **Reference** **Sizes:** **unit**

31.0 BASE COMPUTER SYSTEM & SOFTWARE REQUIREMENTS:

31.1 The data stored in the Smart Meter memory including **defrauded energy** shall be available on the BCS AND HES.

31.2 BCS AND HES shall give all details pertaining to billing and load survey data.

31.3 All the data available in the Smart Meter including energy, MD etc. with date and time stamp, new TOD time zones and historical data shall be available in BCS AND HES after down loading. All the data/ items of Push Button Mode Display Parameter List should be available in BCS / HES in preferably better resolution.

31.4 The Smart Meter condition details shall also be transferred into the BCS AND HES including abnormal voltage & current conditions, tamper events etc.

31.5 Facility to view data incorporating external multiplying factor due to installed CT & PT may preferably be provided in BCS AND HES.

31.6 The BCS AND HES shall have facility to convert Smart Meter reading data into user definable ASCII file format so that it can be integrated with the billing system or any other third-party software. The user shall have the flexibility to select the parameters to be converted into ASCII file.

31.7 The bidder has to supply the Smart Meter reading protocol and API free of cost. The bidder shall indicate the relevant standard to which the protocol is compliant.

31.8 In BCS AND HES twelve months' data for MWh, MVAh, MD in MVA (total & TOD wise), average load factor, average power factor in both Import/Net (Import - Export) mode must be available.

31.9 Six copies of BCS AND HES shall be provided for downloading data and issue of authenticated command from Laptop.

31.10 Smart Meter Data Display:

31.10.1 The BCS AND HES shall show electrical conditions existing at the time of reading the Smart Meter in tabular forms as well as in graphical format (phase or diagram)

32.10.2 All the information shall be shown in a manner which user can understand easily.

32.10.3 All the load survey data shall be available in numerical as well as graphical format. It shall also be possible to view this data in daily, weekly and monthly formats. The load survey graph shall also show values where the cursor/pointer is placed for selected or all parameters.

32.10.4 All the information about tamper events shall be accompanied with date & time stamping along with the -Snapshot‖(details) of the respective electrical conditions. This information shall be displayed in the sequence in which it happened, in cumulative format as well as summary format. The cumulative format shall segregate a particular tamper information and summary report should show count of tamper occurrence and the duration for which Smart

Meter remained under tamper condition.

31.11 Support Display: There shall be user-friendly method for viewing current and stored history Smart Meter data. All information about a particular consumer shall be segregated and available at one place so that locating any consumer's past data is easy. It shall be possible to locate/retrieve data on the basis of one of the following particulars:

i. Consumer ID
ii. Smart Meter Serial No.
iii. Date of Smart Meter Reading
iv. Location

31.12 Configurability: It shall be possible to get selective print out of all the available data of the Smart Meter. Print out shall not include anything and everything available with the BCS AND HES. The software shall support "Print Wizard" or similar utility whereby user can decide what to print out. The user of the software need not revert back to the supplier of the software for modifying the software just to print what he desires.

It is very important that the BCS AND HES has the feature to export available data to ASCII or spreadsheet format for integrating with the WBSEDCL's billing system. Here again an "Export Wizard" or similar utility shall be available whereby user can select file format (for ASCII or for spreadsheet), what data to export, the field width selection (whether 8 characters or 10 characters, to include decimal point or not, number of digits after decimal point) etc.

31.13 Security: The BCS AND HES shall have multi-level password for data protection and security. The first level shall allow the user to enter the system. The different software features shall be protected by different passwords. The configuration of passwords shall be user definable. The software installed on one computer shall not be copy-able on to another computer.

31.14 Help: The exhaustive on-line Help should be available with the software so that user can use all the features of the software by just reading the Help contents.

32.0 GENERAL REQUIREMENTS:

32.1 GUARANTEED TECHNICAL PARTICULARS: The bidder shall furnish all the necessary information as desired in the Schedule of Guaranteed Technical Particulars and data, appended with this Specification. If the bidder desires to furnish any other information in addition to the details as asked for, the same may be furnished against the last item of this **Sub-Annexure A**.

32.2 TECHNICAL DEVIATIONS: Any deviation in Technical Specification as specified in the Specification shall be specifically and clearly indicated in the Schedule of deviation format.

32.3 TESTS:

32.3.1 Type Testing of Meter: The offered meters shall be type tested at any NABL accredited laboratory in accordance with IS 13779 and CBIP Report 325 with their latest amendments. The type test report shall not be more than 3 (three) years old. Acopy of the Type Test results shall be enclosed with the offer. If there is any modification in the design / parameters of the specifications or use of constituent materials in the offered meters submitted with the offer, from the meter which was submitted type tested, which may affect the characteristics as well as parameters of the meter, revised type test certificates as per the design, parameters and constituent material used in the offered meter, shall have to be submitted failing which the offer may be liable to be rejected. Type Test Certificate from any NABL accredited Lab shall only be considered. Type test certificate shall contain the following information clearly:

32.3.1.1 Type of display or LCD
32.3.1.2 Class of accuracy
32.3.1.3 Meter constant
32.3.1.4 Type of meter

32.3.2 Acceptance tests: The acceptance tests as stipulated in CBIP / IS (with latest amendments) shall be carried out by the supplier in presence of purchaser's representative. In case of failure of Meters as specified in Recommended Sampling Plan of IS-13779, the entire lot will be treated as rejected. Also, the following additional tests are to be carried out on one meter randomly selected from each lot offered for inspection / acceptance testing. In case of failure of any single meter the entire lot will be rejected.
32.3.2.1 Magnetic induction of external origin (AC & DC)
32.3.2.2 Tamper & Fraud protection, as per relevant Clause of this specification.
32.3.2.3 Test of endurance upto120%of I_{max}, for two hours, followed by verification of limits of error.
32.3.2.4 Verification of internal components.
32.3.2.5 Dry Heat Test under Test of Climatic Influences in IS 13779: 1999 of one meter from the offered lot is to be arranged by the supplier at any NABL accredited laboratory, at his cost.

32.3.3 Routine Tests: Each and every meter of the offered lot shall undergo the routine tests as well as functional tests as per IS: 13779/1999, CBIP Report 325 and after sealing the meters, the manufacturers will have to submit the routine test report of all the meters as well as a statement showing seal Sl. Nos. against each meter serial number of offered lot in soft copy (MS WORD or EXCEL format), to the Chief Engineer(Procurement and Contract) and the Chief Engineer(DTD), along with offer letter for acceptance test.

32.4 TEST FACILITIES: The tests for equipment / instrument shall be carried out as per relevant Standards and test certificates shall be furnished for scrutiny. The Bidder shall indicate the details of the equipment available with him for carrying out the various tests as per relevant Standards. The bidder shall indicate the sources of all equipments / instruments.

32.5 The standard meters used for conducting tests shall be calibrated periodically at any NABL Accredited Test Laboratories and test certificates shall be available at Works for verification by purchasers' representative.

32.6 The manufacturer shall have at least the following testing facilities to ensure accurate calibration:

32.6.1 AC high voltage test
32.6.2 Insulation test
32.6.3 Test of no-load condition
32.6.4 Test of Starting condition
32.6.5 Test on Limits of error (Automatic Testing facility with ICT)
32.6.6 Power loss in voltage and current circuit
32.6.7 Test of Repeatability of error
32.6.8 Test of meter constant
32.6.9 Test of magnetic influence (As per CBIP 325 & Permanent Magnet)

32.7 INSPECTION:

The purchaser may carry out the inspection at any stage of manufacture. The manufacturer shall grant free access to the purchaser's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the purchaser shall not relieve the supplier of his obligation of furnishing the equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective. All acceptance tests and inspection shall be made at the place of manufacturer unless otherwise especially agreed upon by the Bidder and purchaser at the time of purchase. The Bidder shall provide all reasonable facilities without charge to the inspector, to satisfy him that the equipment is being furnished in accordance withthis specification.

The supplier shall keep the purchaser informed in advance, about the manufacturing programme for each lot so that arrangement can be made for inspection. The purchaser reserves the right to insist for witnessing the acceptance

/ routine testing of the bought-out items. The supplier shall give 15 days for local supply / 30 days in case of foreign supply advance intimation to enable the purchaser to depute his representative for witnessing the acceptance and routine tests.

The purchaser reserves the right to get type test any meter, for meter casing etc. from any of the offered lots, reserve at any destination stores.

33.0 SUBMISSION OF SAMPLE METER:

The bidder will submit his sample Meters in sealed casing / cartoon along with relevant Meter documents (**As per Sub-Annexure D)**, within the specified period as mentioned in NIT, to theOffice of the Chief Engineer (DTD), Abhikshan, Sec-V, Salt Lake, Kolkata-91.

33.1 While submitting the samples and required documents as per Annexure-IV, the bidder shall submit three numbers of sealed meters as per the specifications stated herein before.

33.2 The date of testing of sample meters will be intimated to the bidders by CE(DTD) and during such test other bidders will also be allowed to witness the testing. Sample submission and Test procedure may be changed due to emergency requirement. On the date of testing of sample meters of a particular bidder, he shall come prepared with:

33.2.1.1 BCS (as per specification)

33.2.1.2 CMRI compatible with BCS and loaded with CMRI software and laptop compatible with BCS.

33.2.1.3 Modem and accessories for testing the remote meter reading.

33.2.1.4 Any other accessories required for observing the performance and capabilities of the meters.

34.0 QUALITY ASSURANCE PLAN: The design life of the meter shall be minimum 20 years and to prove the design life the firm shall have at least the following Quality Assurance Plan:

34.1 The factory shall be completely dust proof.

34.2 The test rooms shall be temperature and humidity controlled as per relevant standards.

34.3 The test and calibrating equipments shall be automatic and all test equipment shall have theirvalid calibration certificates.

34.4 Meter will be tested (in case of lot test) in fully automatic test bench with ICT. No human intervention will be allowed during test.

34.6 Power supplies used in test equipment shall be distortion free with sinusoidal wave formsand maintaining constant voltage, current and frequency as per the relevant standards.

35.0 THE CHECKS TO BE CARRIED OUT DURING MANUFACTURING OF THE METERS:

35.1 Smart Meter frame dimensions tolerances shall be minimal.

35.2 The assembly of parts shall be done with the help of jigs and fixtures so that human errorsare eliminated.

35.3 The meters shall be batch tested on automatic, computerized test bench and the results shallbe printed directly without any human errors.

36.0 INFORMATION TO BE FURNISHED WITH THE BID: The Bidder shall invariably furnish the following information along with the bid, failing which the bid shall be liable for rejection. Information shall be separately given for individual type of material offered.

36.1 Statement giving list of important raw materials, names of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested, list of tests normally carried out on raw materials.

36.2 Information and copies of test certificates in respect of bought out accessories.

36.3 List of manufacturing facilities available.

36.4 Level of automation achieved and lists of areas where manual processing exists.

36.5 List of areas in manufacturing process, where stage inspections are normally carried out of quality control and details of such tests and inspections.

36.6 List of testing equipment available with the bidder for final testing of equipment specified and test-plant limitations, if any, vis-à-vis type, special acceptance and routine tests specified in the relevant standards and this specification. These limitations shall be very clearly brought out in schedule of deviations.

36.7 The list of components used in the meter.

36.8 A detailed list of bought-out items, which are used in the manufacturing of the meter indicating the name of firms from whom these items are procured. The details of quality assurance procedures followed in respect of the bought-out items.

36.9 The details of testing facilities available for conducting the routine and acceptance tests and other special tests on the meter.

36.10 The facility available if any for conducting type test.

36.11 Principle of operation of the meter, outlining the methods and stages of computation of various parameters starting from input voltage and current signals including the sampling rate, if applicable.

36.12 The relevant documents regarding the procurement of polycarbonate material.

37.0 LAB FACILITY: The laboratory of manufacturer must be well equipped for testing of the meters. They must have computerized standard power source and standard equipment calibrated not later than a year (or as per standard practice).

38.0 MANUFACTURING ACTIVITIES:

38.1 All the materials, electronics and power components, ICs used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life andsustained accuracy. The manufacturer shall use

Application Specific Integrated Circuit (ASIC) or Micro controller for metering functions.

38.2 The electronic components shall be mounted on the printed circuit board using latest Surface Mounted Technology (SMT) except power components by deploying automatic SMT pick and place machine and re flow solder process. The electronic components used in the meter shallbe of high quality and there shall be no drift in the accuracy of the meter at least up to 10 years.

38.3 Further, the Bidder shall own or have assured access (through hire, lease or sub-contract) of the mentioned facilities. The PCB material shall be of glass epoxy FR-4 grade conforming to relevant standards.

38.4 All insulating materials used in the construction of meters shall be non-hygroscopic, non- ageing and tested quality. All parts that likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating. Quality shall be ensured at the following stages.

38.5 At PCB manufacturing stage, each board shall be subjected to bare board testing.

38.6 At insertion stage, all components shall undergo testing for conforming to design parameters and orientation. Complete assembled and soldered PCB shall undergo functional testing using test equipments (testing jig).

38.7 Prior to final testing and calibration, all meters shall be subjected to accelerated ageing testto eliminate infant mortality, i.e., meters are to be kept in ovens for 72 hours at 55 deg Centigrade temperature & atmospheric humid condition. After 72 hours meters shall work correctly. Facilities / arrangement for conducting ageing test shall be available with the manufacturer.

38.8 The calibration of meters shall be done in-house.

39.0 DOCUMENTATION:

Twenty sets of operating manuals shall be supplied to the office of the CE (DTD) for distribution at sites.
One set of routine test certificates shall accompany each dispatch consignment.
The acceptance test certificates in case pre-dispatch inspection or a routine test certificate in cases where inspection is waived shall be approved by the purchaser.

40.0 GUARANTEE:

The Meters and Pilfer Proof Meter Boxes shall be guaranteed arising out of faulty design, materials, bad workmanship for a period of **5½ years** from the date of supply.

Life of battery used for the meter shall be guaranteed for 10 years.

41.0 REPLACEMENT OF DEFECTIVE METERS: The meters declared defective within the above guarantee period by the WBSEDCL shall be replaced by the supplier up to the full satisfaction of the WBSEDCL at the cost of supplier within one month on receipt of intimation. Failure to do so within the time limit prescribed shall lead to imposition of penalty of twice the cost of meter. The same may lead to black listing even,as decided by WBSEDCL. In this connection the decision of WBSEDCL shall be final.

42.0 PACKING & FORWARDING:

The equipment shall be packed in cartons / crates suitable for vertical / horizontal transport as the Case may be, and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary, proper arrangement for lifting, such as lifting hooks etc., shall be provided. Supplier without any extra cost shall supply any material found short inside the packing cases immediately.

The packing shall be done as per the standard practice as mentioned in IS 15707: 2006. Each package shall clearly indicate the marking details (for e.g., manufacturer's name, Sl. Nos. of meters in the package, quantity of meter, and other details as per supply order). However, the supplier shall ensure the packing is such that, the material shall not get damaged during transit.

43.0 COMPONENT SPECIFICATIONS: The meters shall be designed and manufactured using SMT (Surface Mount Technology) components, except for power supply components, LED / LCD etc., which are PTH type. All the material and electronic power components used in the manufacture of the meter shall be of highest quality and reputed makes so as to ensure higher reliability, longer life and sustained accuracy. The Components used for manufacture of meter shall be of high quality and the bidders shall confirm component specification as specified below in Sub-Annexure C Bidders shall compulsorily fill Sub-Annexure A, Sub-Annexure B & Sub-Annexure C for technical qualification.

Sl. no.	Component Function/ Feature	Requirement	Make / origin
1	Current Element	E-beam /spot welded CT shall be provided in the phase element and in the neutral with proper isolation.	Any make or origin conforming to IS-2705
2	Measurement /computing chips	The Measurement / computing chipsused in the meter shall be with the Surface mount type along with the ASICs.	USA: Analog Devices, AMS, Cyrus Logic,Atmel, SAMES, Texas Instruments, Teridian; Japan: NEC, Freescale, Renesas; Holland: Phillps
3	Memory chips	The memory computing chips shall not be affected by the external parameters like sparking, high voltage spikes or electrostaticdischarges.	USA: National Semi Conductor, Atmel, SAMES, Texas Instruments, Teridian, ST, Microchip; Japan: Hitachi, OKI, Freescale, Renesas; Holland/ Korea: Phillps
4	Display modules	The display modules shall be well Protected from the external radiations. The display shall be clearly visible over an angle of at least a cone of 70o.The construction of the modules shall be such that the displayed quantity shall not disturbed with the life of display. The display shall be TN type industrial grade with extended temperature Range UV.	Singapore: Bonafied Technologies; Korea: Advantek; Japan: Hitachi, SONY, Hijing, Truly Semiconductor; Chaina: Tianma
5	Communication modules	Communication modules shall becompatible for the RS 232 ports	USA: National Semiconductors, HP, ST,Texas Instruments, Agilent, Avago; USA/Korea: Fairchild; Holland/ Korea:Philips; Japan: Ligitek, Hitachi, Germany: Siemens, Taiwan: Everlight,
6	Optical port	Optical port shall be used to transferthe meter data to meter reading instrument. The mechanical construction of the port shall be suchto facilitate the data transfer easily.	USA: National Semiconductors,Texas Instruments, HP, Agilent,Avago, Germany/USA: Osram; Japan:Hitachi, ,21; Germany: Siemens; Holland /Korea: Philips; Taiwan: Everlight,
7	Power Supply	The power supply shall be with the capabilities as per the relevantstandards. The power supply unit ofthe	As specified.

		meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
8	Electronic components	The active & passive components shall be of the surface mount type & are to be handled & soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Phillips, Texas Instruments, ST, Onsemi; Japan: Hitachi, Oki, Toshiba. Freescale; Korea: Samsung.
9	Mechanicalparts	The internal electrical components shall be of electrolytic copper &shall be protected from corrosion, rust etc. The other mechanical components shall be protected from rust, corrosion etc. by suitable plating / painting methods.	N.A.
10	Battery	Lithium-ion with guaranteed life of10 years	Renata, Panasonic, Varta, Sanyo, National, Tadiran, Sony, Duracell, Tekcell, Mitsubishi, EVE, SAFT, XENO
11	RTC / Micro controller	The accuracy of RTC shall be as per Relevant IEC / IS standards	USA: Dallas, Atmel, Motorola, NEC, Teridian Renesas, Texas Instruments, ST, Microchips, Epson; Holland / Korea: Philips; Japan: NEC, OKI, Hitachi, Mitsubishi, Freescale,
12	Pilfer Proof Meter Box	Technical specification given in separate sheet	Thermosetting Plastic

SUB-ANNEXURE A		
GUARANTEED TECHNICAL PARTICULARS OF AC THREE PHASE FOUR WIRE, L.T. STATIC, WHOLE CURRENT (20-100) A IMPORT EXPORT ENERGY METER WITH LCD DISPLAY		
Sl. No.	**Item Description**	**Manufacturer's Particulars**
1.	Name of manufacturer	
2.	Type (Model No.), name & number	
3.	Standard Applicable	IS: 13779/1999, IS:12346/ 1988, IS: 14434/1998, CEA regulation no. 502/70/CEA/DT&D dt.17.03.06 and CBIP technical reportno.325 with its latest amendment as on date.
4.	Rating	
(i)	Accuracy Class	Class 1.0
(ii)	Rated Voltage	240V Ph to Neutral (+20% to -30%)
(iii)	Rated current	I_b-20 Amp, I_{max}- 100 Amp
(iv)	Rated frequency	50 Hz ± 5%
(v)	Power factor	0 lag to unity to 0 lead
(vi)	Minimum saturation current	Bidders to specify
(vii)	Meter Constant (imp / KWH)	
5. (i)	Maximum. Continuous current rating (Amp.)	100 Amps
(ii)	Continuous current rating of terminals for two hours	120 Amps
(iii)	Running with no load & (-)70% to 120 % voltage	No creeping
6.	Short time over current for 10 milliseconds	30 I_{max} for one half cycle at rated frequency
7.	Starting current at which meter shall run & continue to run	0.2% of I_b at rated voltage and unity power factor
8.	Power loss at rated frequency & reference temperature	
(a)	Current circuit at rated current	Less than 4 VA per phase
(b)	Voltage circuit at rated current	Less than 1.5W / 10VA per phase
9.	Type of material used	
(a)	Base	High impact strength, non-hygroscopic, fire retardant, fire resistant, UV stabilized poly carbonate (Lexan 503R or equivalent). Meter base with LEXAN 500R/143R may be accepted subject to verification.
(b)	Meter cover	High impact strength, non-hygroscopic, fire retardant, fire resistant, UV stabilized transparent poly carbonate (Lexan 943A orequivalent)

(c)	Terminal Block	Material High impact strength not hygroscopic, fire retardant, fire resistant, UV stabilized poly carbonate (Lexan 503R or equivalent) Barrier of adequate size shall be provided between phase and neutral. Terminal block with LEXAN 500R/143R may be accepted subject to verification.
(d)	Terminal cover	High Impact strength, non-hygroscopic, fire retardant, fire resistant, glass reinforced poly carbonate (Transparent)& non-detachable with hinging arrangement (Lexan 943A or equivalent). Terminal cover with LEXAN 143 may be accepted subject to verification.
(f)	Screw	
	(i) Material	Tin/Nickel-plated Brass
	(ii) Size	As per relevant IS Standards
10.	Internal diameter of Terminal Hole	Min. 9.5 mm
11.	Centre to Centre clearances between adjacent terminals	13 mm
12.	Transducers	
(i)	Input	C T provided in phase element and in the neutral. Voltage: Potential divider (PT less)
(ii)	Output	LCD
(iii)	CT - no. of turns	Bidders to specify
13.	Type of Register	LCD suitable for operation up to 60°C
(i)	No. of Digits	7 (integer only)
(ii)	Size of Numerals	10.0 X 5 mm (minimum)
14.	Display	
(i)	On up and down Scroll Mode & Auto display mode	Both required
(ii)	Type of push button	Spring loaded push button to be provided on top cover of meter to read parameters.
15.	Reading on power off condition	Meter shall be able to display reading during power outage withbackup power through the push button provided on the meter. All data down loading facility shall be provided in power off condition.
16.	Battery of Real time clock	
(i)		It shall be Lithium-ion battery having at least 10 years of life
(ii)		The drift in time shall not exceed +/- 3 minutes per year
17.	Fixing/sealing arrangement	

(i)	Fixing of meter	3 fixing holes (one at top & two at bottom under sealable terminal cover). The top fixing screw shall not be accessible after meter is fixed to Pilfer Proof Meter Box base.
(ii)	Sealing of meter cover to Base	At least, two fixing screws for fixing meter cover with the meter base shall be provided. Each Screw shall have two holes one for fitting/fixing of manufacturer's seal and the other for utility seal. The arrangement shall be in such manner that any access to the working part of the meter body will not be possible without breaking/ tampering / removing the said seals. Suitable arrangement shall be made for fitting/fixing of utility seal at two sides of meter terminal cover in such a manner that any access to the terminal cannot be possible without removing the seals. There shall also be provision for sealing at the optical port. The meter cover shall be permanently fixed to the base by ultrasonic welding or by any other technology which is either equally or more efficacious so that cover cannot be opened without breaking, i.e. the meter shall be break to open type. Meter shall have an indication in its display if top cover is removed.
18.	Type of hinged undetectable terminal cover	Terminal cover shall be hinged.
19.	Performance of meter in tamper conditions	
(i)	Input and output Terminals interchanged	Shall work within specified accuracy
(ii)	Change of phase sequence	Shall work within specified accuracy
(iii)	Phase current reverse	Shall work within specified accuracy
(iv)	Indication of above tamper condition	LCD / LED indication.
20.	Suitability of meter to sustain over voltage i.e. phase to phase voltage injected between phase & neutral	Shall sustain
21.	Electromagnetic compatibility (EMI / EMC severity level)	As per IS 13779: 1999
22.	(i) Effect on accuracy of external electromagnetic interference of electrical discharge, external Magnetic field	Shall work within accuracy as per latest IS& CBIP report - 325with latest amendment.
	(ii) Current reversal, Neutral disturbance & Magnetic tamper logging in memory	Meter shall log last 300 events with date and time
23.	Effect on accuracy under tamperconditions / influence conditions	Shall work within accuracy specified in IS: 13779 / 1999, and CBIP tech. Report 325. Error beyond +/- 4 % will not be acceptable for conditions not specified in IS: 13779 / 1999 & CBIP tech. Report 325.

24.	Drift in accuracy of measurement with time.	No Drift in accuracy in measurement with time

25.	Name plate details	It shall cover all the details as prescribed in relevant Clause of tech spec.
26.	Approximate weight of meter	Bidders to specify
27.	Type of mounting	Projection type
28.	Calibration	Meter shall be software calibrated at factory & there shall not be any mechanical form of calibration, such as, mechanical preset / trim port / potentiometer etc. so that any adjustment in calibration is not possible after freezing the meter constant.
29.	Manufacturing activity	
	(i) Mounting of components on PCB shall be SMT type	SMT type and ASIC technology
	(ii) Compliance to assurance	To be complied
30.	Testing facility	
(i)	Fully automatic computerized meter test bench with print out facility shall be available	Must be available
(ii)	Make and Sl. No. of Test bench with calibration validity	Bidders to specify
(iii)	Accuracy of ESS duly calibrated	Bidders to specify
(iv)	Following in house testing facility shall be available:	
	(i) AC high voltage test	Must be available
	(ii) Insulation test	Must be available
	(iii) Test of no-load condition	Must be available
	(iv) Test of Starting condition	Must be available
	(v) Test on Limits of error	Must be available
	(vi) Power loss in voltage and current circuit	Must be available
	(vii) Test of Repeatability of error	Must be available
	(viii) Test of meter constant	Must be available
	(ix) Power loss in voltage & current circuit	Must be available

	(x) Test of Magnetic influence	Must be available
31.	Whether offered meter type tested as per ISS 13779 / 1999 Table-20 for all the following tests (indicate name of laboratory/ Reference of report No. & date)	Relevant Clause of General Requirement.
(i)	Vibration test	12.3.2
(ii)	Shock test	12.3.1
(iii)	Spring Hammer test	12.3.3
(iv)	Protection against penetration of dust and water	12.5
(v)	Test of resistance to heat & fire	12.4
(vi)	Power consumption	12.7.1
(vii)	Influence of supply voltage	12.7.2
(viii)	Voltage dips and interruptions	12.7.2.1.
(ix)	Short time over current	12.7.3
(x)	Influence of self-heating	12.7.4
(xi)	Influence of heating	12.7.5
(xii)	Impulse voltage test	12.7.6.2
(xiii)	AC high voltage test	12.7.6.3
(xiv)	Insulation test	12.7.6.4.
(xv)	Radio Interference measurements	12.9.5
(xvi)	Fast transient burst test	12.9.4
(xvii)	Electrostatic discharge	12.9.2
(xviii)	Immunity to electro-magnetic H.F. field	12.9.3.
(xix)	Test for meter constant	12.15
(xx)	Test of starting conditions	12.14
(xxi)	Test of no-load condition	12.13
(xxii)	Ambient temp. influence	12.12
(xxiii)	Test of influence quantities	12.11
xxiv)	Interpretation of test results	12.16
(xxv)	Repeatability error test	12.17
(xxvi)	Dry heat test	12.6.1
(xxvii)	Cold test	12.6.2
(xxviii)	Damp heat cycle test	12.6.3
(xxix)	Test of influence of immunity to Earth fault	12.8
(xxx)	Limits of error	11.1
32.	Guarantee period of meter	5-1/2 years from the date of supply. Guarantee period shall be printed on the nameplate
33.	BIS license	

33.1	BIS license No. & dt. with its validity for ISI certification markon offered meter.	Bidders to specify.
33.2	Details of meter design for which above BIS certification has been obtained:	Bidders to specify.
(i)	Ratio of I_b to I_{max}	
(ii)	Material of meter body	
(iii)	Type of energy registering counter	
(iv)	Type of technology (Digital/Analog)	
(v)	Grade of printed circuit Board material	
(vi)	Type of assembly of component used (SMT)	
(vii)	Meter constant (Imp / KWh)	
(viii)	Auxiliary power circuit (with PT or PT less)	
(ix)	Current circuit (CT / Shunt combination or only shunt)	
(x)	Accuracy class	
34.	Other parameters / features not covered in the above GTP	Conform to specification of IS 13779: 1999 & CBIP technical report No.325 (with its latest amendment).

Sub-Annexure B
Pre-Qualification Conditions for Three Phase Static Meters

Sl. No.	Particulars	Remarks
1	Bidders must have valid BIS certification for the offered meter.	Yes / No
2	Bidder preferably possess ISO 9001 certification	Yes / No
3	Bidder shall be manufacturers of static meters having supplied Static 1-ph or 3-phase meters with memory and LCD display to Electricity Boards /Utilities in the past 2 years	Yes / No
4	Bidder has Type Test certificate for the Type of offered meter not more than 3 (three) years old	Yes / No
5	Bidders shall have dust free, static protected environment for manufacture, assembly and Testing.	Yes / No
6	Bidder shall have automatic computerized test bench for lot testing of meters.	Yes / No
7	Bidder has facilities of Oven for ageing test.	Yes / No
8	Bidder shall submit certificate for immunity against magnetic influence of 0.2 T AC. & 0.5 T DC. from a NABL accredited Laboratory, for the same type of meter as offered	Yes / No

Sub-Annexure C

Sl. No.	Component Function / Feature	As per Requirement	Make / origin
1	Current Element		
2	Measurement / Computing chips		
3	Memory chips		
4	Display modules		
5	Communication modules		
6	Optical port		
7	Power Supply		
8	Electronic components		
9	Mechanical parts		
10	Battery		
11	RTC / Micro controller		

Sub-Annexure D

Sl. No.	LIST OF DOCUMENTS TO BE SUBMITTED DURING SAMPLE SUBMISSION			
1	Attested copy of type test reports from NABL accredited laboratory			
2	Attested copy of BIS certificates of the same type of meter submitted as sample			
3	Attested certificates as regards material used for meter case, cover & terminal block.			
4	Annexure – II as per tender documents			
5	Annexure – III as per tender documents			
6	Operating manual of the meter submitted			

Tamper Logic

A. Import Mode:

Sl. No.	Parameter	Occurrence	Restoration
1	**Power Related Tamper:**		
i)	Power Failure	i. All Phase Voltages < 30% of Vref ii. Phase Current <5% of Ib	i. Any Phase Voltage >40% of Vref ii. Phase Current Ignored
	Logging Time	After 5 min	Immediate
2	**Voltage Related Tamper:**		
i)	Invalid Voltage (UI)	i. All Phase Voltages >60% & <115% of Vref ii. Angle difference of any two Phases > ±10 ° iii. Current Ignored	i. All Phase Voltages >60% & <115% of Vref ii. Angle difference of two Phases < ±10 ° iii. Current Ignored
	Logging Time	After 5 min	After 5 min
ii)	Missing Potential (Logging Phase Wise) (UF r)	i. Any Phase Voltage <30% of Vref & Current >10% of Ib	i. Logged Phase Voltage >40% Vref & Current >10% of Ib

		ii. Other Phase Voltages >40% & <115% of Vref	ii. Other Phase Voltages >40% & <115% of Vref
	Logging Time	After 5 min	After 5 min
	This is Phase wise Tamper		
iii)	High Voltage (UH)	i. Any Phase Voltage >115% of Vref ii. Current Ignored	i. All Phase Voltages <115% of Vref ii. Current Ignored
	Logging Time	After 5 min	After 5 min
iv)	Voltage Unbalance (UU)	i. All Phase Voltages >70% & <115% of Vref ii. (Vmax-Vmin)>30% of Vref iii. All phase Current > 10% of Ib	i. All Phase Voltages >70% & <115% of Vref ii. (Vmax-Vmin) <30% of Vref iii. Current Ignored
	Logging Time	After 5 min	After 5 min
3	**Current Related Tamper:**		
	Phase wise Tamper:		
i)	CT Open (Logging Phase wise) (Io b)	i. Iresidual >20% of Ib ii.Phase Current <2% of Ib iii. Line Current ignored iv. All Phase Voltages >70% and <115% of Vref	i. Iresidual <20% of Ib ii. Phase Current >2% Ib iii. Average Phase Current >10% of Ib iv. All Phase Voltage >70% and <115% of Vref
	Logging Time	After 5 min	After 5 min
ii)	Over Current (IH)	i. Any Phase Current >150% of Imax ii. All Phase Voltage >70% and <115% of Vref	i. All Phase Currents <150% of Imax ii. All Phase Voltage >70% and <115% of Vref
	Logging Time	After 5 min	After 5 min
4	Other Tampers:		
i)	Low PF (LP)	i. All Phase Currents>10% of Ib ii. Average PF<0.3 iii. All Phase Voltages >70% and <115% of Vref	i. All phase currents > 10% Ib ii. Average PF>0.3 iii. All Phase Voltages >70% and <115% of Vref
	Logging Time	After 5 min	After 5 min
ii)	Neutral Disturbance (ND)	Frequency < 45 Hz or > 55 Hz	Frequency is between >=45Hz or <=55Hz
	Logging Time	After 3 min	After 3 min
iii)	Magnet (nt)	Whenever the Meter functionality gets affected on account of presence of any magnetic field, meter shall log it as an event and start recording at Imax if does not remain immune. In Tamper Snap Shot Imax must be shown (either occurrence or restoration), with Date and Time stamp. If meter detects magnetic tamper in "Export" mode, the energy increment shall be made in Import mode as per Vref, Imax and UPF.	
	Logging Time	Instantaneous	Instantaneous
iv)	Cover Open	On Removal of meter cover the meter will lock Cover Open Event with Date and Time stamp. It must be reflected in Auto Display mode	No restoration shall be allowed without due authorization
	Logging Time	Immediate	
v)	Voltage THD	When Voltage THD > 5% in any phase	When Voltage THD < 5% in all phases

	Current TDD	When Current TDD > 5% in any phase	When Current TDD < 5% in all phases

B. Export Mode:

Sl. No.	Parameter	Occurrence	Restoration
1	Neutral Disturbance and Magnet	In Export Mode, meter recording must not start at Imax. Under any circumstances, if meter logs Neutral Disturbance or Magnetic Field Tamper event and starts recording at Imax then it will log in Import Register insteadof Export Register.	
	Logging Time	Bidder choice	Bidder choice
	Manual Resetting of Maximum Demand:		
When Reset Button is pressed within an Integration Period, Rising Demand will not reset to Zero. The Demand will be registered for the entire IntegrationPeriod and will be logged as Current Max. Demand at the end of the Integration Period.			

(C) Communication Network and Equipments:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1.	**NIC Card**	• The plug-in type communication WAN module shall be in accordance to the variant - 2, C3 as defined under IS16444. • The plug-in type communication WAN module shall be based on Cellular 4G fallback to 2G • Shall support UMTS/HSPA+ and GSM/EDGE, GPRS fallback and integrate IPv4 (preferably IPv6) stacks. • Shall enables TCP/IP connectivity to every end-point device (Smart Meter) • It shall support 3/ 1.8V SIM interface and shall accept standard preferably two SIM cards or one e-SIM • For network protocol it shall comply to the standard mentioned in IS16444 clause 9.3 • DLMS enabled smart meters (IS16444), the WAN module shall access the full range of DLMS capabilities supported by the smart meter • The 4G Cellular WAN module shall support both IPv4 /IPv6 schema as per availability from network service provider. • The Cellular WAN shall automatically	

		register to HES at powerup. • It shall support IPv4 and IPv6 network addressing. • Each WAN module shall be provisioned with a private, static IP address not visible or routable from the public internet. • If fixed IP and operator VPN is not available /possible and Dynamic IP is being used, then the cellular WAN module shall support SSL/ VPN and the data shall be encrypted before send / received on Cellular last mile network. • It shall be fitted with LED for visual indication for Power ON, Traffic status or should have separate display dedicated for communication module status including the signal strength. • WAN module must be capable of operating on the power drawn from the smart meter as defined in BIS standard of Smart meter IS16444. • The power consumption of WAN module shall optimal to meet the requirement of clause 6.10.1.1 of IS 16444 for both Idle mode and communication mode. • WAN module must not exceed maximum power requirement of 7W in any case and it shall be in line with the smart meter standard as per IS16444. There must be proper protection and isolation between smart meter and WAN Module power supply. • The module shall be able to send diagnostics logs/ data periodically to HES. • It shall support Push Services, alarms services of the smart meter as defined in IS16444 and IS15959 part 2 and 3. • It shall facilitate delivery of first breath and last gasp and other event alarms as defined in IS16444 and IS15959 part 2&3. • It shall support remote firmware upgradation. • It shall be secure enough to avoid all cyber threats like DDoS, spoofing, malwares etc. • Network should have proper cyber security system and that shall also be subjected to Annual Security Audit from CERT-In listed auditors. • The communication network shall ensure secure communication of data to HES. • The list of standards followed in all the devices/equipment used in communication	

		network shall be furnished.	

(D) Head End System (HES):

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**General requirement**	a) HES system should preferably be inter-operable amongst different makes of meters (preferably from at least 3 types from leading Meter OEMs in INDIA). b) In case the bidder offers meters for this project from different meter manufacturers, the offered HES system should be inter-operable amongst those different makes of meters.	
2	**Communication and security**	a) It will maintain Two-way communication with meter and to communicate with MDM on other side. b)The HES system should comply with the communication protocol as defined in IS standard 16444 and IS 15959 (for data exchange for electricity meter reading tariff and load control) including latest amendments. c) The system shall include mechanisms for defining and controlling user access also encryption of data for secure communication. d) Have meter key management facility and data exchange with smart meter with security key as defined in IS16444.	
3	**Functionality & Interface**	a) It will support self-discovery and self-registry functionality to detect and register meters within 5 minutes of meter connection. b) Acquisition of meter data on demand & at user selectable periodicity. c) Audit trail and Event & Alarm Logging. d) Store raw data for defined duration (minimum 6 days). e) Handling of Control signals / event messages on priority.	

		f) Setting of Smart meter configurable parameters. g) Communication device status and history. h) Maintain time sync with meter without any data loss. i) Support OTA firmware upgradation. j) Support net metering functionalities of end nodes. k) Provide web-based interface to manage functionalities. l) Intelligent enough to detect and report critical and non-critical events. m) HES shall interface with MDMS on standard interfaces and the data exchange models and interfaces shall comply with CIM as per IEC 61968 Part 9: 2013. The solution shall be Service Oriented Architecture (SOA) enabled. Able to integrate with standard Integration BUS/ middleware.	

(E) Meter Data management System (MDMS):

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**General requirement**	a) The Meter Data Management system (MDMS) shall support storage, archiving, retrieval & analysis of meter data and various other MIS along with validation & verification algorithms. b) The MDM shall be a scalable and COTS product. c) It shall act as a central data repository with interactive dashboard. MDM shall have capability to import raw or validated data in defined formats and export the processed and validated data to various other systems sources and services in the agreed format. d) It shall provide validated data for upstream systems such as billing, analytics, reporting, etc. e) MDM should support the future requirement of utility by way integration with other smart grid functionalities as and when implemented by Utility. f) The system should support the collection and storage of data for meeting the performance level for 130% of the quantity of Smart Meters under scope with facility of future expansion. g) The MDM shall have the ability to selectively choose which data to be maintained and which to be purged or archived as per requirement of Utility (user selectable).	
2	**Asset management**	a) The MDM shall maintain information and relationships between the current installed meter location (apartment, shop, industry/ address etc.), Consumer information (Name etc.), Consumer account no, Meter ID, Type of Meter (type of consumer, 1 phase/ 3phase, with or without relay, etc.), Meter configuration (Demand integration period,	

		Load profile capture period etc.), GIS supplied information (longitude, latitude, connection with feeder/ transformer/ pole etc.) etc. b) The system should support tracking the status of meters and communication equipment from the date when they are installed in the field. The history of in-service asset location is maintained throughout the device life with start and end dates associated with each in-service location reference. c) The system should have the ability to report and log any damage/ deterioration in the meter attributable to consumer /utility.	
3	**AMI installation support**	a) The MDMS shall support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDMS shall generate exceptions for meter or modules not delivering the correct meter data after installation. b) The MDM shall provide a reconciliation report that identifies the meters that have been installed but not communicating for a designated (configurable) period. MDM shall generate reports on the number of meters installed in comparison to the number of meters successfully communicating.	
4	**Meter data**	a) The MDM shall accept input, process, store, and analyse Meter data from HES and meter data collected through handheld meter reading instruments and manual meter reads. In case of manual reads, provision should be there to insert associated notes such as assessed energy, etc. It would responsibility of AMISP for manual meter reading in case of any communication failure, etc. with seven (7) days of such failure. b) The MDMS should accept input, process, store, and analyse non-billing meter data such voltage and power quality data (such as under/over voltage, out of band frequency, etc.) as they are available from HES. The MDMS should also support schedule and on-demand meter reads and	

		pinging of meter energized states by authorized users and by other utility systems. c) The system should be designed in such a way that on necessity, the archiving of data could be done at a monthly frequency and all data older than 5 Years should be archived. The IA's solution should describe the process of archiving and restoration from the archive. The archiving instructions may be provided to IA by WBSEDCL in future, however, provisioning of such in the system is to be designed by the IA. d) The MDMS shall provide storage and retrieval of all collected Meter Data, events and alarm in a readable and intelligible format. It shall have capacity of storing 5 years data after archiving. e) Correctly track & resolve energy usage across meter changes with no loss of individual meter data. f) Provide complete history and audit trail for all data collected from meters including commands sent to meters and other devices for 30 days (configurable period). g) Execute on-demand read processes. h) Handle special metering configurations such as net metering/pre-paid metering/multiple meters at same premises. i) The MDMS shall have the ability to manage at a minimum 5-minute interval data.	
5	**Exception management**	a) Ability to capture and log data exceptions, problems and failures and to generate management reports, provide trend analysis, automate generation of service requests and track corrective actions. b) Ability to group, prioritize, filter and send system generated alarms and events to predetermined email addresses, cellular text messages to phone numbers/SMS/consumer care etc. Alternatively, these alarms/alerts may be routed to utility's WFMS, when implemented. c) Exception Generation - MDMS shall generate exceptions based on configurable business rules including but not limited to the following:	

		i) Meter tamper alerts ii) Communication module health alerts for meters. iii) If the consumption is less/more than pre-defined average consumption. iv) Negative Consumption (not for net-metering) v) Power outage indications received from the Smart Meter.	
6	**Service orders**	a) The MDMS shall generate service orders based on configurable rules for various events and alarms such as stop meter, tampers, problem in communication networks, etc. b) MDMS shall send service orders via SMS, email, etc. with the email addresses / phone numbers being configurable. MDMS shall receive feedback on action taken on the service order and track the status of service orders until resolution. c) Service order tickets could be generated by MDMS. When WBSEDCL may implement a Work Force Management System (WFMS), then the service order tickets can be routed from the MDM to the WFMS for completion of the tasks and reporting.	
7	**Revenue protection support**	a) Ability to analyse meter tampering flags, power outages, usage trends and usage profiles to identify potential energy diversion situations, and produce daily reports, monthly reports and service order requests for investigation. b) The business rules for revenue protection alerts shall be configurable via a user-friendly interface. c) The MDMS shall filter out revenue protection alerts that may be caused by field activities if the field activity information is provided to the MDMS. d) The MDM shall support the analytics/investigation (i.e., view current and historical usage patterns) to validate suspected revenue protection issues.	

(F) Mobile application for Consumer Information, Meter Installation & Meter Advising:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	General	a) During consumer indexing and meter installation implementation agency will use android/iOS based mobile application.	
2	Scope	a) Consumer Indexing team (for capturing consumer's information) b) Documentation and Approval of prescribed format for Consumer indexing & Smart Meter installation and sealing information. c) Resource deployment and Responsibility allocation d) Quality and Safety Assurance during field work	

(G) Consumer Portal/App:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	General	a) The consumer web portal and the mobile application (for smartphone and tablet devices using latest and commonly available browsers and operating systems and platforms) shall provide consumers, ready access to features extended by MDM. b) The Solution shall integrate via a user-friendly graphical interface. It shall facilitate self service capabilities such as usage management, billing, service requests, participation in energy efficiency programs etc. c) The Consumer Portal / App acts as the bridge between the consumers touch point and the existing utility Customer Care and Billing Systems. d) The credentials to log in the portal and app should adhere to the cyber security guidelines and policies of GoI and WBSEDCL.	
2	Scope	a) The mobile app and web portal shall support all device form factors such as mobile, tablet, desktop etc. by recognizing the device details automatically. b) It shall be OS agnostic to operating system and devices (iOS, Android, etc.)	

		c) It shall work on all standard browsers such as Internet Explorer (IE), Chrome, Safari, Firefox etc. d) The application should be modular and scalable a COTS product. e) It shall support multiple languages viz Hindi, English and local language(s). Also, notifications should be sent to consumers in local languages. f) The application should be native for better user experience. g) The user experience of the citizen on the Portal and App shall be similar in terms of look and feel, navigation, menu and access to preferences and other data. h) Menu should have navigation options, not limited to, Home, Settings, Recharge, notification preferences, usage rates, change password, terms and conditions, privacy policy, sign out. i) It shall have search functionality across all the pages. j) The payment gateway page of WBSEDCL to be redirected in the Portal/app	
3	Functionality	a) The consumer portal/app shall have a landing Home page. The login should be OTP based for Registered users as well as New Users once the registration is done from their choice of phone number. A mechanism to retrieve and set new password shall also be there. b) The consumer portal/app shall provide consumers with access to consumer ID, meter ID, meter type and name plate details, besides other account information such as account name, address, balance, due, status etc. Any status message pertaining to the account/s viz. alerts/actions shall be displayed here. It shall also provide current and historical consumption in graphical formats for at least 12 months. A more detailed analysis can be provided in a tabular format listing meter reading date, reading, consumption, charges, selected period etc. Consumers shall be able to view interval data, outage flags, voltage, power quality indications, existing tariffs and incentives for selected period. Information about different consumer engagement programs shall also be displayed here. c) The portal/app shall have the ability to provide option for registering in online/paper billing to the consumer. There shall be a bill	

		summary page that shall display bill information in summary and also option for detailed view and download in pdf format if required by consumer. The use shall be able to pay bill for single and multiple accounts. d) The portal/app shall be integrated with existing CA helpdesk of WBSEDCL and have the ability to provide option for recording service requests/complaints lodged by the consumer as new connection, disconnection, load change, category change, meter shifting etc. The user can view the service request status. The user can register complaints viz. power failure, faulty meter, etc. There shall be option to track status of service requests. e) Mobile App and Web Portal shall facilitate Chat-bot functionality of the utility's Help Desk. The portal/ App shall support configuration of notification types via email/ SMS/ message/ automated call (through utility IVRS), of configured alarms & events. f) The information on consumer identification no., meter ID, name plate details, make, type i.e., 1 Phase or 3 Phase, etc. (as per requirement of Utility) shall be updated in HES, MDM, and the consumer portal/app. g) The consumer Portal/ App shall have the ability to provide the consumer near real time online views of both usage and cost differentiating high energy usage periods, helping consumers to understand electricity usage and cost information, alerts and notifications and energy savings tips with different levels of detail. h) The Portal/ App shall support the view for past electricity usage, last week's, yesterday's, current days or other period etc. as per selection as well as voltage and power quality indications. The portal/ app shall provide user friendly access to consumer for their data via graphs and charts and can download the data into a spreadsheet. i) The portal/app shall provide option to the consumer to view/download online bill. There shall be a bill summary page that shall display bill information in summary and option for detailed view and download in pdf format. The user shall be able to pay bill for single and multiple accounts. j) The portal/app shall also provide platform for implementation of peak load management	

		functionality by providing existing tariff & incentives rates, participation options etc. The portal/app shall also provide consumers with interval data, flags, voltage, power quality indications etc. Show outage information in map view. k) There should be different UI and landing pages for different type of consumers as per the need of utility. l) User interface to consumer Portal/ App to access consumer's data from MDM for all authorized consumers shall have ability for at least the following functionality: 1. View metered data, monthly average usage, current monthly consumption, maximum demand and other reports. 2. View data according to Time of Day (ToD), day, week, month, year and season etc. 3. Update profile information such as mobile number/email etc. 4. Guest user account/multi-user account access facility for consumer convenience. 5. Initiate request for connection/disconnection. 6. Initiate service requests for maximum demand updating, meter checking etc. 7. Initiate complaints such as Meter not working, supply off etc. 8. In case on net-metering consumers, user can view data for both import & export data. 9. Can view recharge history, present balance, next possible recharge date and amount etc. 10. Historical energy consumption and energy charges during the desired time period. 11. Facility to recharge their account through the payment gateway facilitated by the utility.	

(H) Utility User Interface:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**General**	a) User management with roles and access rights. b) Should have the access of data from both HES and MDMS. c) GUI to provide role-based access based on user identity and user role. Shall have following types of users:	

		12. Administrator 13. Operator 14. Field staff 15. Viewer/Guest d) Configure the look, feel, and functionality of the MDM in accordance with business needs, business processes, and business conventions. (E.g., GUI, content, look and feel of screens, validation rules, exception handling, etc.).	
2	**Functionality**	a) Display meter data at a user defined configurable cycle that allows authorized users to view energy usage patterns and the data behind them for selected consumers including display of phasor diagram, load survey graph etc. b) Allow authorized users to view metered data, initiate and view reports, modify configurations, and initiate and update service requests. c) Display the energy usage profile for a single meter or group of meters. The load profile shall illustrate energy consumption and peak demand in user defined intervals for a user-specified time period. d) Display the energy usage profile for a single meter or group of meters according to Time of Day (ToD) tariff. e) The UI shall support a configurable utility dashboard for Operations and Utility Management. f) Access to a minimum of three (3) years of historical energy usage and meter reads through the UI. g) Clearly and visually distinguish between metered, estimated, allocated and substituted data. h) Ability to set up alarm and event notifications that can be directed to a combination of configurable email addresses, cellular text messages. i) Option to send marketing messages and notification to select consumers or selected	

		category of consumers. j) Facility to enable or disable existing functionalities/sections of App/Portal for consumers use. k) Able to generate various reports at different intervals the various reports. It shall also be possible to export the report data in multiple formats such as XLS, CSV format, etc. l) Consumer views to be available to Utility consumer Service Executive also except payment card/bank information. m) Authorised representative to be enabled for consumer engagement analytics. The analytics to be configurable/ generated with minimal database skill and nil programming requirements. n) Provide consumer interactions history to enable efficient consumer complaints and queries resolution with consumer information in single screen. o) Compare total energy costs on one rate schedule vs. one or many alternative rates. p) Enable the user to see how different options within a rate affect costs. q) Enable the user to see how adjusting load or consumption levels or shifting them to different time periods influences costs.	

(I) Software Applications:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**License**	• The License be in the name of WBSEDCL. • The License should be perpetual.	
2	**Compliance**	• The software shall be compliant with Symantec Endpoint Protection antivirus version 14.3 and above. • The OS and application of the desktops and servers shall have to be under compliance of WBSEDCL's security policy.	

3	**Updates and patches**	• The software shall have to be updated so as to process data for any new series of Smart meter introduced in the circuit. • Any update or patches of the application software, OS and DB are needed to be compliant to the latest WBSEDCL security policy and shall have to be applied by the vendor for smooth running of the system.	

(J) Integration Interface of Existing Enterprise Applications:
WBSEDCL will provide the required integration interface details of each of the existing applications which it wants to integrate with the AMI system with the selected AMISP. The following indicative list of applications are required to be integrated:

SYSTEM TECHNOLOGY	OEM
Billing & Pre-paid Module	SAP-ISU
Web portal & App	WBSEDCL web Portal & App
CRM	Oracle
ERP	SAP
GIS / GIS (Network Analysis)	ESRI
MDAS	Custom Application
SCADA/ DMS	OSI
OMS	To be installed in future

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**General**	a) Shall easily integrate to Standard applications using industry standard interfaces and be API based. b) The integration is expected to be on on-line real time basis or batch mode where appropriate and shall operate in an automated fashion without manual intervention. c) All interfaces are to be self-checking so that any exceptions or data validation errors are reported by the system. In addition, integration logs should be maintained that confirm the success or otherwise of the interface, complete with control totals. d) The integration mechanism adopted must have minimal impact on the existing systems. The access to data will only be through applicable business rules i.e. the applications will not access data directly	

		without going through APIs managed by business rules/validation/workflow.	

(K) Other scope of the project:

Sl. No.	Description of the Features	Minimum Requirement of Features	As per Bidder's Offering
1	**Procurement of other Software**	• Procurement of Analytics, Virtualization Software (if required), Centralized network management software along with patch management, OS, any Repository Software and any third-party Software or open Source software.	
2	**Integration Layer**	• For ease of implementation, maintenance and scalability it is recommended to use a continuous Integration Bus/Integration Middleware layer that have inbuild ready connectors that could then be used to undertake any future integration between applications. The integration middleware shall be based on Service Oriented Architecture (SOA)and shall use visual Mapping points.	
3	**Cyber Security**	• Comply with Cyber Security System monitoring as per CERT guideline	
4	**System Environments and Security Zone deployment**	• Comply with System Environment Requirements. • Comply with Security Zone Deployment	
5	**System Performance**	• To comply with System Performance Measures and as per disaster recovery plan submit detailed system offerings.	
6	**Testing Plan**	• Offering any automated test tool/ process for virtual HES test bench (produce dummy IS15959 meter data) for different unit/load/integration testing.	
7	**Training and Handholding**	• Training and Handholding plan to make utility ready for system handover.	

ANNEXURE-X: TECHNO COMMERCIAL DEVIATION SHEET

1.If the proposal has got any deviation from the Technical specification, the bidder shall tabulate those deviations clause by clause.

Sl. No	Clause No	Description	Deviation offered	Remarks:(+) ve / (-) ve

2. If the proposal has got any deviation from the commercial terms, the bidder shall tabulate those deviations here clause by clause.

Sl. No	Clause No	Description	Deviation offered	Remarks: (+) ve / (-) ve

Signature of Authorised Signatory with office seal

Name and address of the bidder:

Note: When there is no deviation, this sheet is to be submitted with the offer duly signed with an endorsement indicating "No Deviation".
Deviations not indicated here will not be taken into consideration.

ANNEXURE-XI: PROPOSED KEY RESOURCE FORMAT

(FORM PER-I)

Proposed personnel:

Bidder should provide the names of suitably qualified personnel to meet the specified requirements. The data on their experience should be supplied using the form below for each candidate.

1	Title of position:	
	Name:	
2	Title of position:	
	Name:	
:	Title of position:	
:	Name:	
5	Title of position:	
	Name:	

(FORM PER-II)

Resume of Proposed Personnel:

Name of Bidder:

Position		
Personnel Information	Name	Date of Birth
	Professional qualification	
Present Employment	Name of Employer	
	Address of Employer	
	Telephone	Contact (Manager/Personnel Officer)
	Fax	E-mail
	Job title	Years with present Employer

Summarize professional experience in reverse chronological order. Indicate particular technical and management experience relevant to the project.

From	To	Company/Project/Position/Relevant technical and management experience

ANNEXURE-XII: PRE-BID QUERY FORMAT

West Bengal State Electricity Distribution Company Limited
Tender Notice No. WBSEDCL/IT & C/33.10 (iv)/ , Dtd.

Pre-BID Query Format

Name of the Bidder:

Sl. No.	Clause No of the Tender Document	Page No of the Tender Document	Text Details	Query Details	Justification of the Query	Remarks
1						
2						
3						
: :						
N						

ANNEXURE-XIII: PROFORMA OF DECLARATION OF BLACK LISTING/HOLIDAY LISTING

Reference: Tender Notice No. WBSEDCL/IT & C / 33.10 (iv)/ Dtd.

In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s _____ which is submitting the bid for the work nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a managing partner have been placed on black list or holiday list declared by WBSEDCL, WBSETCL or any central/ state power utility services, except as indicated below:

(Here give particulars of black listing or holiday listing, and in absence thereof state "NIL")

In the case of a Partnership Firm:

We hereby declare that neither we, M/s _____ submitting the bid for the work nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern have or has been placed on black list or holiday list declared by WBSEDCL, WBSETCL or any central/ state power utility services, except as indicated below:

(Here give particulars of black listing or holiday listing, and in absence thereof state "NIL")

In the case of a Company:

We hereby declare that we have not been placed on any black list or holiday list declared by WBSEDCL, WBSETCL or any central/ state power utility services, except as indicated below:

(Here give particulars of black listing or holiday listing, and in absence thereof state "NIL")

It is understood that if this declaration is found to be false in any particular WBSEDCL, WBSETCL or Administrative Ministry, shall have the right to reject the Bid and if the bid has resulted in a contract, the contract is liable to be terminated.

Signature of Authorised Signatory with office seal

ANNEXURE-XIV: PROFORMA OF DECLARATION REGARDING ABANDONMENT OR RESCISSION OF WORK

Reference: Tender Notice No. WBSEDCL/IT & C /33.10 (iv)/ Dtd.

In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s _____ which is submitting the bid for the work nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a managing partner neither have abandoned any work nor any of our contract have been rescinded during the last 5 (five) years, except as indicated below:

(Here give particulars of abandonment or rescission of work and in absence thereof state "NIL")

In the case of a Partnership Firm:

We hereby declare that neither we, M/s _____ submitting the bid for the work nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern neither have abandoned any work nor any of our contract have been rescinded during the last 5 (five) years except as indicated below:

(Here give particulars of abandonment or rescission of work and in absence thereof state "NIL")

In the case of a Company:

We hereby declare that we neither have abandoned any work nor any of our contract have been rescinded during the last 5 (five) years, except as indicated below:

(Here give particulars of abandonment or rescission of work, and in absence thereof state "NIL")

It is understood that if this declaration is found to be false, The WBSEDCL shall have the right to reject the Bid and if the bid has resulted in a contract, the contract is liable to be terminated.

Signature of the Tenderer with seal
Dated _____

ANNEXURE-XXV: Manufacture's Authorization Form (MAF)

Tender Reference No.& Tender ID._____

Dear Sir,
We _____(OEM) who are established and reputed manufacturers of _____(Equipment) having Factories at _____ and _____confirms that , M/s. _____(Name and address of Bidder herein after called as partner) wishes to participate the Bid or Project stated above and enter into agreement for the purchase and resale of _____(OEM) Products and, Service. The Partner is entitled and authorized to the following.

(a) Resale, and/or distribute _____(OEM) products and/or services in India to end users within that Territory.
(b) Bid, negotiate and conclude a contract with _____ for the above products/services manufactured or supplied by _____ (OEM).
_____(OEM) will, within the scope of its agreement with its authorized channels, provide product warranty services and technical support for _____ (OEM) products obtained through its authorized channels for a defect liability period mentioned in the Tender document referred above, from the date of installation at _____(Work-site name).
_____(OEM) certify that, the equipment being sold would not be declared End of Sale (EoS) within defect liability period and that _____(OEM) shall supply suitable substitute in case EoS of equipment. Also _____(OEM) certifies that the products being sold would be covered under Warranty/Technical Support and technical support will be available for defect liability period from the date of installation at _____(Work-site name).
If you need any additional information, please contact Mr./Ms. _____ at_____ (Mobile No.) of _____(E-mail ID).

Yours faithfully,

Name of the person:

For and on behalf of M/s.
Designation:
Contract Details:
Date:
Place:
(Name of Original Equipment Manufacture- OEM) (Seal of OEM)

ANNEXURE-XVI: PROFORMA OF "CONTRACT AGREEMENT"

(*To be executed on non-Judicial stamp paper of Rs. 100/-*)

This Agreement made this.....day of.....two thousand..... between West Bengal State Electricity Distribution Company Limited, having its head office at Vidyut Bhawan, Bidhannagar, Kolkata – 700 091 (hereinafter referred to as `Owner' or `WBSEDCL', which expression shall include its administrators, successors and assigns on one part) and **M/S ----------**(hereinafter referred to as the `Contractor' , which expression shall include its administrators, successors, executors and permitted assigns) on the other part.

WHEREAS WBSEDCL is desirous of data collection from Feeder Meters and DT Meters in different locations of WBSEDCL as per its LOA No. ----------

AND WHEREAS **M/S ----------** had awarded the Contract on terms and conditions, documents referred to therein, which have been acknowledged by **M/S ----------** resulting into a "Contract".

1) NOW THEREFORE THIS DEED WITNESSETH AS UNDER: -

1.0 **Article**

1.1 Award of Contract

WBSEDCL awarded the Contract to Contractor for the AMC work of the AMI devices installed at different remote locations of WBSEDCL under WBSEDCL on the terms and conditions contained in its Letter of Award No. ----------. and the documents referred to therein. The award has taken effect retrospectively from the date of issue of the Award. The terms and expressions used in this Agreement shall have the same meaning as are assigned to them in the `Contract Documents' referred to in the succeeding Article.

2.0 Documentation

The Contract shall be performed strictly as per the terms and conditions stipulated herein and in the following documents attached herewith (hereinafter referred to as "Contract Documents").

i. **Tender No.----------**
ii. **LOA No. ----------**

All the aforesaid Contract Documents shall form an integral part of this Agreement, in so far as the same or any part conform to the Bidding Documents and what has been specifically agreed to by the Owner in its Letter of Award. Any matter inconsistent therewith, contrary or repugnant thereto or any deviations taken by the Contractor in its `Proposal' but not agreed to specially by the Owner in its Letter of Award shall be deemed to have been withdrawn by the Contractor. For the sake of brevity, this agreement along with its aforesaid Contract Documents shall be referred to as the `Contract Agreement'.

3.0 Conditions & Covenants

3.1 The scope of Contract, Consideration, Terms of Payment, Taxes wherever applicable, Insurance, Liquidated Damage, Performance Guarantees and all other terms and conditions are contained in WBSEDCL's Letter of Award No. ---------- read in conjunction with other aforesaid Contract Documents. The Contract shall be duly performed by the Contract Documents, but which are needed for successful, efficient, safe and reliable operation of the system unless otherwise specifically excluded in the specifications under `exclusions' or `Letter of Award'.

3.2 The scope of work shall also include supply and other activities of all such items which are not specifically mentioned in the Contract Documents, but which are needed for successful, efficient, safe and reliable operation of the entire supplied and commissioned system unless otherwise specifically excluded in the specifications under `exclusions', or `Letter of Award'.

3.3. Time Schedule

Time is the essence of the Contract and schedules shall be strictly adhered to. "**M/S ----------**" shall perform the work in accordance with the agreed schedules.

3.4. Quality Plans

3.4.1 The Contractor agrees to provide the Owner with the necessary facilities for carrying out inspection, quality audit and quality surveillance of Contractors and its Sub-contractor's Quality Assurance Systems.

3.4.2 It is expressly agreed to by the Contractor that the quality tests and inspection by the Owner shall not in any way relieve the Contractor of its responsibilities for quality standards, performance guarantee and their other obligations under the Agreement.

3.5 The Contractor guarantees that the equipment used under the contract shall meet the ratings and performance parameters as stipulated in the technical specifications and in the event of any deficiencies found in the requisite performance figures, the Owner may at its option reject the equipment package or alternatively accept it on the terms and conditions and subject to levy of the liquidated damages in terms of contract documents. The amount of liquidated damages so leviable shall be in accordance with the contract documents.

3.6 It is further agreed by the Contractor that the contract performance guarantee shall in no way be construed to limit or restrict the owner's right to recover the damages/compensation due to short-fall in the equipment performance figures as stated in Para 3.5 above or under any other clause of the Agreement. The amount of damages/compensation shall be recoverable either by way of deduction from the contract price, contract performance guarantee and or otherwise.

3.7 The contract performance guarantee furnished by the Contractor is irrevocable and unconditional and the Owner shall have the powers to invoke it notwithstanding any

dispute or difference between the owner and the contractor pending before any court tribunal, arbitrator or any other authority.

3.8 This Agreement constitutes full and complete understanding between the parties and terms of the presents. It shall supersede and prior correspondence terms and conditions contained in the Agreement. Any modification of the Agreement shall be effected only by a written instrument signed by the authorized representative of both the parties.

4.0 SETTLEMENT OF DISPUTES

4.1 During execution of this contract, if any dispute arises thereby, shall be settled amicably between WBSEDCL and yourself to the extent possible.

4.2 The necessary legal affairs and / or court case shall be exclusively within the jurisdiction of Kolkata High Court only at Kolkata only.

4.3 Notice of Default: Notice of default given by either party to the other party under Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto if delivered against acknowledgement or by fax or by registered mail with acknowledgements due addressed to the signatories at the addresses mentioned at Kolkata.

IN WITNESS WHEREOF, the parties through their duly authorized representatives have executed these presents (execution where of has been approved by the competent authorities of both the parties) on the day, month and year first above mentioned at Kolkata.

---------- **(Signature of Ordering Authority with Printed Name, Designation, Office Seal)**
---------- **(Signature of Contractor with Printed Name, Designation, Company's Seal)**

ANNEXURE-XVII: FORMAT OF BANK GUARANTEE FOR CONTRACT PERFORMANCE

(*To be stamped in accordance with Stamp Act*)

Bank Guarantee No._____
Ref No._____ Date: _____

To
The West Bengal State Electricity Distribution Company Limited,
Vidyut Bhavan, Salt Lake,
DJ Block, Sector-II,
Kolkata -700 09l (India).

Dear Sir,

In consideration of West Bengal State Electricity Distribution Company Limited (hereinafter referred to as WBSEDCL) which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns having awarded to M/s _____ with its Registered/Head Office at _____ (hereinafter referred to as the 'Contractor') which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns, a Contract by issue of Order No.____ dated_____ valued at_____ for_____ (Scope of Contract) and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equipment to *----- %(percent) of the value of the entire system vide Order No. ..... date .....(reference of original order), against Contract to WBSEDCL.

We _____(Name and Address) having its Head Office at_____ hereinafter referred to as the `Bank') which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns do hereby guarantee and undertake to pay WBSEDCL, on demand any and all moneys payable by the Contract to the extent of _____as aforesaid at any time up to (day/month/year) without any demur, reservation, contest recourse or protest and or without any reference to the Contractor. Any such demand made by WBSEDCL on the Bank shall be conclusive and binding notwithstanding any difference between WBSEDCL and the Contractor or any dispute pending before any before any Court, Tribunal or any other Authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of WBSEDCL and further agrees that the guarantee herein contained shall continue to be enforceable till the WBSEDCL discharges this guarantee.

WBSEDCL shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee from time to time extend the time for performance of the Contract by the Contractor. WBSEDCL, shall have the fullest liberty, without affecting this guarantee to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time and any manner, and either to enforce or to forbear to enforce any covenants, contained or implied in the Contract between WBSEDCL and the Contractor or any other course of remedy or security available to WBSEDCL. The Bank shall not be released of its obligations under this presents by any exercise by WBSEDCL of its liberty with reference to the matters aforesaid or any of them or by reason or any other acts of omission or commission on the part of WBSEDCL or any other indulgence shown by WBSEDCL or by any other matter or thing whatsoever which under the law would but for this provision have the effect of relieving the Bank.

The Bank also agrees that WBSEDCL at its option shall be entitled to enforce this guarantee against the Bank as a Principal debtor, in the first instance without proceeding against the Contractor and

notwithstanding any security or other guarantee that WBSEDCL may have in relation to the contractor's liabilities.

Notwithstanding anything contained herein above our liability under this guarantee is restricted to_____ and shall remain in force up to and including_____ and shall be extended from time to time for such period, as may be desired by M/s._____ to whose behalf this guarantee has been given.

All rights of WBSEDCL under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities there under unless the WBSEDCL enforce a claim under this guarantee against the Bank within three months from the above-mentioned date or from the extended date.

Dated this _____day of_____20 ___ at _____

Witness:

_____ _____

(Signature) (Signature)

_____ _____

(Name) (Name)

_____ _____

(Official address) (Designation with Bank Stamp)

_____

Attorney as per Power of

Attorney No._____

Date_____

ANNEXURE-XVIII: PROFORMA OF INDEMNITY BOND

(*To be executed on Non-Judicial Stamp Paper of Rs. 100/-*)

BY THE PRESENT INDEMNITY BOND EXECUTED by me/us on this……..Day of……..2022……..I/We having Registered Office/residing at……
(hereinafter called "OBLIGOR/OBLIGATOR" which expression shall mean and includes my /our Successors, legal representatives assigns) do hereby binds myself/ourselves and also our company/firm……..after having the power to bind so with the promise and undertaking in favour of West Bengal State Electricity Distribution Company Limited /West Bengal State Electricity Transmission Company Limited, Government Company within the meaning of Sec 617 of the Indian Company's act having registered office at Vidyut Bhawan Block-DJ, Sector-II, Salt Lake city,Kolkata-700091(hereinafter called as OBLIGEE, which expression shall mean and include it's legal representative ,administrators assigns.

Whereas OBLIGOR/OBLIGATOR has/have been awarded to execute the job/works under letter no……dated …….issued by the OBLIGEE/OBLIGATOR after having observing necessary formalities the details of which is described in the schedule given hereunder as per letter mentioned herein-above and whereas the said job/works will be/likely to be done in places covered under Employees' State Insurance Act(ESI) and /or the Employees Compensation Act (W.C. Act) and /or other laws relating to the Labour Management and Welfare.

And whereas according to the condition of the contract the OBLIGOR/OBLIGATOR is under obligation to execute this Indemnity Bond before the commencement of actual execution and OBLIGOR/OBIGATOR is aware that unless this Indemnity Bond is executed in accordance with the condition of contract before the actual execution in accordance with law the OBLIGEE shall have the power to deem that actual work has been started within the meaning of the contract before the execution of this Indemnity Bond.
Now this indenture witnesses that I/we the OBLIGOR/OBLIGATOR do hereby undertake: -

1. That the OBLIGEE shall not be held responsible for any type of accident which may take place during the course of work undertaken by OBLIGOR/OBLIGATOR.
2. That the OBLIGOR/OBLIGATOR will take/adopt all safety norms in respect of each and every workmen/lab our personnel according to the rules or to the satisfaction of the OBLIGEE in all cases.
3. That the OBLIGOR/OBLIGATOR undertakes to engage only those labour/worker or any other ,personnel whether skilled or unskilled or any other person whether in technical, managerial or non-managerial or any other capacity in the area covered under Employees 'State Insurance Act who has /have insurance coverage within the meaning of Employees' State Insurance Act and further undertakes NOT to engage any person in the area covered under the Employees' State Insurance Act, who does /do not has/have insurance coverage within the meaning of Employees' State Insurance Act.

4. That the OBLIGEE, further undertakes to engage only those labour, worker, or any other personnel, whether skilled or unskilled, whether in technical, managerial or non-managerial or other capacity in the area NOT covered under Employees' State Insurance Act, who has life insurance for the sum assured equivalent to the amount of Compensation under the Employees' Compensation Act in case of accidental death or inquiry and such insurance has been effected by the OBLIGEE.
5. That the OBLIGOR/OBLIGATOR undertakes/undertake to indemnify and keep harmless the OBLIGEE from all claims, action, proceeding and of risk, damage, danger to any person whether belonging to/or not belonging to OBLIGOR/OBLIGATOR.
6. That the OBLIGAOR/OBLIGATOR shall keep harmless the OBLIGEE from all claims. Compensation, damages, any proceedings in respect of any of its employee/workmen under Work men Compensation Act, Act or any other law for the time being in force.
7. That, if during the course of execution of work as stated in the letter mentioned hereinabove issued by the OBLIGEE it is found that the OBLIGOR/OBLIGATOR has not complied with/guidelines formalities within the meaning of Employees' State Insurance Act or Employees Compensation Act or any other laws relating to the Labour welfare for the time being in force, and also has not observed the safety norms in accordance with the law to the satisfaction of the OBLIGEE ,the OBLIGEE shall have the right to stop the execution of work/job and the period of such stoppage shall continue till adequate safety and other compliance mentioned hereinabove under the Labour Welfare Legislation have been observed and such period of stoppage shall not be taken into account for calculation of the period of completion of work for which the OBLIGOR/OBLIGATOR is responsible to complete the work/job and it will be deemed that discontinuance was due to default of OBLIGOR/OBLIGATOR.
8. That, if at any time, due to exigency, the OBLIGEE i.e. the West Bengal State Electricity Distribution Company Limited (WBSEDCL)), as the Principal Employer, becomes liable to pay any such compensation mentioned hereinabove, whether on failure of the OBLIGATOR or for any other reason, the OBLIGEE shall have the right to recover the said amount from any amount receivable by OBLIGATOR or any bank guarantee deposited or anything payable by the OBLIGEE to the OBLIGATOR or TO HIS AUTHORITY whether in connection with this contract or by other contract .
9. That the OBLIGOR/OBLIGATOR is/are aware that for the persistent or repeated violation of any condition mentioned in this Indemnity Bond, the OBLIGEE shall have right to terminate the contract of work issued by the OBLIGEE to OBLIGOR/OBLIGATOR.

_____

Deponent

Witness

1……..

2……..

ANNEXURE-XIX: INSTALLATION CONFIRMATION CERTIFICATE FORMAT

Installation Certificate of Consumer Smart Meter

Ref LoA No:
Date of Installation:
Name of Region:

Sl. No.	Consumer No./ Installation No./ Con ID	Meter No.	NIC card No.	Seal No.	The Smart Meter is installed at the Consumer premises with necessary SIM cards (yes/no)	meter data communication to HES (yes/no)	Necessary application software installed at PC of site office. Log on credential (User Id and Password) is handed over.	Signature of representative of bidder, with designation and stamp.	Signature of Site Officer, WBSEDCL, Designation with stamp.

Signature of Supervising Officer
Designation with stamp

Signature of Site Officer
Designation with stamp

ANNEXURE-XX: COMMISSIONING CONFIRMATION CERTIFICATE FORMAT

Commissioning Certificate

Ref LoA No:
Date of Installation:
Name of the Region:

Name of the Office:			
Sl. No.	Work Item	Completed (Y/N)	Remarks
1	Satisfactory hands-on live training on system how to use and operate.		
2	The Meter Parameters are successfully monitored and events can be successfully performed from the application.		

Signature of Supervising Officer
Designation with stamp

Signature of Site Officer
Designation with stamp

ANNEXURE XXI: FORMAT OF THE PERFORMANCE CERTIFICATE

Performance Certificate on Consumer Meter Monthly Billing Data

Ref LoA No:
Name of Region:
For the Month:
Year:

Sl. No	Name of Region	No. of Total consumers Under Scope of this project	No. of cons. Fitted with Smart meters(B)	% of cons. Fitted with Smart meters(C)=A /B*100	No. of cons having WBSEDCL issue (D)	Actual no of billable consumer (E)=(A) –(D)	No. of cons. Billed through AMI(F)	**% of cons. Billed through AMI(G)= F/E*100**	No. of cons. Billed through manual reading (H)	**% of cons. Billed by manual reading (I)**	Remarks
1											
2											
3											
: :											
N											
Weighted average percentage for the region											

NB: Billing data and all types of meter data should be available in MDMS (except any major system or sub-system failure at MDMS end).
One consolidated performance certificate covering billed % against total no. Consumer under scope of this project are to be calculated as per SLA reference.
Other SLA parameters like different scheduled meter data, System availability etc. should be calculated from system with SLA reporting.

*The defined reports available can be generated without any issue using the application.

ANNEXURE-XXII

FORMAT OF THE BANK GUARANTEE FOR ADDITIONAL PERFORMANCE SECURITY DEPOSIT

To,
……..(Designation of Engineer-in-Charge)
……..(Office address of Engineer-in-Charge)
……..
WHEREAS……..(Name and address of Contractor) (hereafter called "the Contractor") has undertaken, in pursuance of Contract No. ……
……
Dated……..to execute……..(name of Contract and brief description of Works)(hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a Scheduled Commercial Bank for the sum specified therein for 'ADDITIONAL PERFORMANCE SECURITY DEPOSIT' for compliance with his obligation in accordance with the Contract;

NOW WHEREAS we……..(indicate the name of the bank and branch) have agreed to give the Contractor such a Bank Guarantee.

NOW THEREFORE we……..(indicate the name of the bank & branch) hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of Rs……(amount of guarantee)…….(in words). We undertake to pay you, upon your first written demand and without cavil of argument, a sum within the limits of Rs……{amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We……(indicate the name of the bank and branch) hereby waive the necessity of your demanding the said debt from the contractor before presenting us with the demand.

We……(indicate the name of the bank and branch) further agree to pay to you any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal……..the present absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the contractor(s) shall have no claim against us for making such payment.

We……(indicate the name of the bank and branch) further agree that no change or addition to or other modification of the terms

of the Contract or of the works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

We…… (indicate the name of the bank and branch) lastly undertake not to revoke this guarantee except with the previous consent of you in writing.

This Guarantee shall be valid up to…….....It come into force with immediate effect and shall remain in force and valid for a period up to the time of completion of the work under the stated contract plus claim period of Six months for the Bank Guarantee. Notwithstanding anything mentioned above our liability against this guarantee is restricted to Rs.....(Rupees……)
and unless a claim in writing is lodged with us within the validity period i.e. up to.....of this guarantee all our liabilities under this guarantee shall cease to exist.

Signed and sealed this day…….of……2023
at

SIGNED, SEALED AND DELIVERED
By: For and on behalf of the BANK

(Signature)
(Name)
(Designation)
(Code Number)
(Address)

NOTES: (1) The bank guarantee should contain the name designation and code number of the officer(s) signing the guarantee.
The address, telephone number and other details of the Head Office of the Bank as well as issuing Branch should be mentioned on the covering letter of issuing Branch.

ANNEXURE-XXIII

NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement ("Agreement") dated Date, Month, Year ("Effective Date") is entered

BETWEEN

WBSEDCL a company incorporated under the provisions of Companies Act, 1956 and having its principal place of business at ..... thereinafter referred to as " ..... " which expression shall mean and include its executions, administrations, subsidiaries and assigns).

AND

M/s …… a company incorporated under the provisions of Companies Act, 2013/1956 and having its principal place of business at ..... thereinafter referred to as ..... which expression shall mean and include its parent, affiliates subsidiaries and assigns) WBSEDCL and collectively referred as parties.

Purpose

WBSEDCL embarked on implementing information Security Management System (ISMS) which involves disclosure of ……. application Landscapes of WBSEDCL which are presently hosted at Data Centre and Data Recovery Centre. Such information is sensitive and confidential in nature. To protect the said confidential information both the parties desire to sign this Non-Disclosure Agreement.

Disclosure of Confidential Information

Either party may disclose to the other party either orally or in any recorded medium, information comprising or relating to its/ or its subsidiaries or franchisees techniques; schematics; designs; contracts; financial information; ERP information; SAP Modules; client data; business affairs; operations; strategies; inventions; methodologies; technologies; employees; subcontractors; pricing; service proposals; methods of operations; procedures; products and / or services (Confidential Information). Confidential Information shall include all nonpublic information furnished, disclosed or transmitted regardless its source.

Confidentiality

Either party shall use the Confidential Information solely in furtherance of the actual potential business relationship between the parties. The parties shall not use the Confidential Information in any way that is directly or indirectly detrimental to the other party and shall not disclose the Confidential Information to any unauthorized third party.

Parties shall ensure that access to Confidential Information is granted only to those of its employees or agents (“Representatives”) who have a demonstrated need to know such information in order to carry out the business purpose of this Agreement. Prior to disclosing any Confidential Information to such /Representatives, party shall inform them of the confidential nature of the information and their obligation to refrain from disclosure of the Confidential Information. Each party and its Representatives will take all reasonable measures to maintain the confidentiality of the Confidential Information, but in no. event less than the measures it uses for its own information of similar type. Parties and its Representatives shall not disclose to any person including, without limitation, any corporation, sovereign, partnership, limited liability company, entity or individual(i) the fact that any investigations, discussions or negotiations are taking place concerning the actual or potential business relationship between the parties, (ii) that it has requested or received Confidential information, or (iii) any of the terms, conditions or any other fact about the actual or potential business relationship.

Each party and its Representatives will immediately notify the other party of any use Of disclosure of the Confidential information that is not authorized by this Agreement. Each party and its Representatives will use

its best efforts to assist the other party in remedying any such unauthorized use or disclosure of the Confidential information Either Party shall implement and follow the rules as laid down in the information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011 as and where apply.
The obligations contained under the agreement will not apply to the extent that either Party can demonstrate that the Confidential information: (a) was part of the public domain at the time of disclosure or properly became party of the public domain, by publication or otherwise; (b) was rightfully acquired by Receiving Party prior to disclosure by Disclosing Party; (c) was independently developed by Receiving Party or its Representatives without reference to the Confidential information: or (d) is required to be disclosed by a government agency or by a proper court of competent jurisdiction; provided; however, that Receiving Party and its Representatives shall provide Disclosing Party prompt prior written notice of such requirement, shall consult with and assist Disclosing Party in obtaining a protective order prior to such disclosure, and shall only disclose the portion of Confidential information which it has been advised by written opinion of counsel is legally required to be disclosed and shall use its best efforts to obtain assurance that confidential treatment will be accorded such information if the protective order is not obtained or if Disclosing Party waives disclosure of such information.

Ownership of Material/No Warranty

Each Party retains all rights, title and interest to its confidential information. No license under any trademark, patent or copyright, or application for same which are now or thereafter may be obtained by the other Party is either granted or implied by the disclosure of confidential information.

Term

This Agreement shall terminate ..... years from the Effective Date. Receiving Party's obligations with respect to confidentiality shall expire after ..... years from the date of disclosure.

Return of Confidential information

Upon written request of either Party, Parties and its Representatives shall promptly return to the other Party all copies of Confidential information in its possession including all copies of any analyses, compilations, studies or other documents prepared by Receiving Party or its Representatives containing or reflecting any Confidential information. Either Party shall clarify in writing that it and its Representatives have returned all such information to the other Party.

General

(a) This Agreement shall be governed by and construed in accordance with the applicable laws of India.
(b) Either Party agrees that breach of the provisions of this Agreement by any Party will cause the other Party and irreparable damage for which recovery of money damages would be made in court of law' is Kolkata inadequate. Receiving Party and its Representatives hereby irrevocably and unconditionally consent to submit to the exclusive jurisdiction of the courts of
Kolkata, West Bengal for any actions, suits or proceedings arising out of a relating to this Agreement and the transactions contemplated hereby (and agree not to commence any action, suit or proceeding relating thereto except in such courts), and further agree that service of any process, summons, notice 'or document by registered mail or tracked courier service to the address set for the above shall be effective service of process for any action, suits or proceeding brought against Receiving Party and its Representatives in any such court.
(c) Neither party may assign any of its rights or obligations under this Agreement without the prior written consent of the other party. This Agreement shall be binding upon and inure to the benefit of the parties permitted successors and assigns.
(d) This Agreement may be amended or supplemented only by a writing that is signed by duly authorized representatives of both parties.

(e) No terms or provision hereof will be considered waived by either party, and no breach excused by it, unless such waiver or consent is in writing signed an authorized representative of the non-breaching party. No consent to, or waiver of, a breach by a party, whether express or implied, will constituted a consent to, waiver of, or excuse of any other, different, or subsequent breach.
(f) If any part of this Agreement is found invalid or unenforceable, that par will be amended to achieve as nearly as possible the same economic and legal effect as the original provision and the remainder of this Agreement will remain in full force.
(g) This Agreement constituted the entire agreement between the parties relating to this subject matter and supersedes all prior or simultaneous representations, discussions, negotiations, and agreements, whether written or oral, in the instant subject matter.

IN WITNESS WHEREOF the parties have executed these presents on the day, month and year first above written.

Signed, Sealed and delivered by:
Shri.....representing
WBSEDCL in presence of:
Witness:
1)

Authorized signature with designation and seal

Signed, Sealed and delivered by:
Shri.....representing
M/S…… in presence of:
Witness:
1)

Authorized signature with designation and seal

ANNEXURE-XXIV

CHANGE REQUEST FORM

CRF No. **Date:**

Request Information: To be completed By Requester			
Change Requested by		Change Title	
Change Reference number (if any)		Location	
Change Urgency *Reason for Emergency Change*	☐ Emergency ☐ Normal	Expected Implementation Date	
Reason for Change			
Change Description			
Initiated By	☐ Incident/Problem ☐ Operational/Business Request ☐ Security requirements ☐ Audit requirements ☐ Others	Change Related To	☐ Hardware level ☐ Application Level ☐ Database Level ☐ OS level ☐ Others
Additional Notes			

Roles	**Name**	**Action taken**	**Date/Time**
Requester			
Implementer			
Authorized by		☐ Accepted ☐ Rejected	
Approved by		☐ Accepted ☐ Rejected	

UAT by Application Team	
Date	Tested By
UAT by Business Team	
Date	Tested By
Reasons for not conducting UAT	Remarks:

Change Roll-Back Procedure (If Applicable)	
Details of Roll Back Procedure	
Prepared By	Date
Reasons for not preparing Roll Back Procedure	

Date of Migration to Production:	**Migrated By:**
Impact on Information Security	☐ Yes (If yes, kindly fill remarks) ☐ No
Remarks (Action Taken):	

ANNEXURE-XXV

THIRD-PARTY DECLARATION FORM

Organization Name & Address:			Date:
First Name _____	Middle Name _____	Last Name _____	Department:
Designation:			

Third Party Access Security Policy

- **User shall access only the appropriate physical area of the premises and appropriate information resource.**
- **Users shall not access any information resources of WBSEDCL, without prior authorization of the concerned officials of WBSEDCL.**
- **User shall not carry any Personal storage media like USB, Hard drives, Mobile phones, DVD/CDs into secured zones like Data Centre, Disaster Recovery Centre, SCADA Centres, Smart Grid Control Centre, etc.**
- **Users shall not access any information resources without the presence of WBSEDCL's authorized personnel.**
- **Any passwords and access privileges given shall not be disclosed to anyone inside and outside WBSEDCL's physical and logical boundaries.**
- **Users shall not engage in abusive or improper use of information resources, which includes, but is not limited to, misuse of resource/ privileges, tampering with resource and unauthorized removal of resource components.**
- **User shall not conduct or permit "hacker" activities. User shall not run "packet sniffers". Users shall not distribute computer viruses, Trojan horses, worms, or any other malicious software.**

I hereby declare that I have understood the information security practices followed at WBSEDCL, and I shall adhere to the procedures.

(Signature of the Requestor)
Date:
Name of the Requestor:

ANNEXURE-XXVI

FORMAT FOR UNDERTAKING FOR QUOTATION SUBMISSION AGAINST SERIAL No.1 OF BOQ PART-I & PART-II

From

Bidder's Name and Address :
Contact person :
Designation :
Telephone No. (Land Line & mobile) :
Fax :
Tender Reference :

To

The Chief Engineer,
IT & C Cell,
West Bengal State Electricity Distribution Company Limited,
3rd Floor, Block- 'D', Vidyut Bhavan.,
Bidhannagar,
Kolkata- 700 09l.

Sub.: Declaration for quotation for Serial no. 1 of BoQ part-I and part-II

Dear Sir,

1. We the undersigned Bidder/(s), have read and examined in details the specifications and other documents of the subject Tender and the published corrigendums till date.
2. We confirm that we are submitting the quotation against serial no. 1 of the BoQ part-I and part-II for the meter: (**Please check the appropriate box against the meter the vendor chooses to supply and put a cross in the other box which shall not be supplied)**. Clicking both boxes shall reject the declaration)

☐ 3-phase whole current import-export meter having current rating 20-100A

☐ 3-phase LT-CT smart meter having internal CT ratio 200/5 A and accuracy class of 0.5s

We declare that the above furnished information is binding upon us and the contract shall be executed strictly in accordance to the declaration.

Yours faithfully,

Date _____
Place _____

(Signature of Authorized Person) _____

(Printed Name) _____

(Designation) _____

(Company Seal) _____

Business Address: