Request for Proposal

for

Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis

Through E-reverse auction mode only

Lot-2 Ujjain Region

Tender specification No.
MD/WZ/06/PUR/TS-1942
Online due date for opening on: 07.04.2026
E Tender ID: 2026_MPPKV_488566_1

Issued by:

Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited
(A GOVT. OF M.P. UNDERTAKING)
Regd. Office :GPH COMPOUND, POLOGROUND, INDORE 452015

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Tender Disclaimer

The information contained in the RFP including but not limited to RFP or Consultancy Agreement or any other documents/ information provided to the Bidders, whether verbally or in writing or in any other form, by or on behalf of Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited Company Limited MPPKVVCL, Indore and its employees or advisors is provided to Bidders on the terms and conditions set out in the RFP and such other terms and conditions subject to which such information is provided.

The RFP includes statements which reflect various assumptions and assessments arrived at by MPPKVVCL, Indore. Such assumptions, assessments and statements do not purport to contain all the information that the Bidders may require. The information contained in the RFP may not be appropriate for all Persons and it is not possible for MPPKVVCL, Indore, its employees or advisors to consider the investment objectives, financial, ongoing programs and particular needs of each Person who reads the RFP. The assumptions, assessments, statements and information contained in the RFP may not be complete, accurate, adequate or correct. Each Bidder should therefore conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in the RFP.

MPPKVVCL, Indore does not make any representation or warranty as to the accuracy, reliability or completeness of the information in this Bid Document. Neither MPPKVVCL, Indore nor its employees shall have any liability to any Bidder or any other person under the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise from or be incurred or suffered in connection with this Bid Document, or any matter deemed to form part of this Bid Document, the award of the Consultancy Assignment, or any other information supplied by or on behalf of MPPKVVCL, Indore or its employees or otherwise arising in any way from the selection process for the award of the Consultancy Assignment.

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MPPKVVCL, Indore may, in its absolute discretion but without being under any obligation to do so, update, amend or supplement the information, assessment, statement or assumptions contained in the RFP. The issue of the RFP does not imply that MPPKVVCL, Indore is bound to qualify any Bidder or to award the Project to any Bidder. MPPKVVCL, Indore reserves all the right to reject all or any of the Bids without assigning any reasons whatsoever.

The statements and explanations contained in this RFP are intended to provide an understanding to the Bidders about the subject matter of this RFP and should not be construed or interpreted as limiting in any way or manner the obligations of the Successful Bidder(s) that will be set out in the Consultancy Agreement or MPPKVVCL, Indore's right to amend, alter, change, supplement or clarify the Projects' scope or the terms of this RFP. Consequently, any omissions, conflicts or contradictions in the RFP (including this RFP and Consultancy Agreement) shall be noted, interpreted and applied appropriately to give effect to this intent, and no claims on that account shall be entertained by MPPKVVCL, Indore.

The Bidders shall bear their own costs associated with or relating to the preparation and submission of their Bids, including copying, postage, delivery charges and expenses associated with any demonstrations or presentations which may be required by MPPKVVCL, Indore or any other costs incurred in connection with or relating to their Bids. All such costs and expenses will be borne by Bidders and (Name of Discom), its employees & advisors shall not be liable in any manner whatsoever for such costs and expenses, regardless of the conduct or outcome of the Bid Process.

Though adequate care has been taken while preparing the RFP, the Bidders shall satisfy themselves that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder before the pre bid meeting as per NIT, then it shall be considered that the RFP is complete in all respects and has been received by the Bidder.

Place: Indore, Madhya Pradesh Date:

SUMMARY

PART I – BIDDING PROCEDURES AND REQUIREMENTS

Section 1: Request for Proposals (RFP) Notice

This Section includes Request for Proposals.

Section 2: Eligibility and Qualification Requirements

This Section contains information regarding specific eligibility and qualification requirements applicable for prospective bidders to be considered for further evaluation of their proposal.

Section 3: Instructions to Bidders and Bid Data Sheet

This Section consists of two parts: "Instructions to Bidders" and "Bid Data Sheet". "Bid Data Sheet" contains information specific to selection and corresponds to the clauses in "Instructions to Bidders" that call for selection-specific information. This Section provides information to help prospective bidders prepare their proposals. Information is also provided on submission, opening and evaluation of proposals, selection of successful bidder and award of contract.

Section 4: Bidding Forms – Technical Proposal

This Section includes the forms for Technical Proposal that is to be completed by the prospective bidders and submitted in accordance with the requirements of Section 3.

Section 5: Bidding Forms - Financial Proposal

This Section includes the financial forms that are to be completed by the prospective bidders, including the bidders' costing and pricing, which are to be submitted in accordance with the requirements of Section 3.

Section 6: Project Requirements

This Section describes the background information of the Project, Scope, of Work, System Requirement, Specifications, Quality Requirements, Service Level Agreement (SLA), Standards, Activities and Tasks, Plans, Deliverables, Documentation, and other requirements/ details related to and/or connected with the Project.

PART II – CONTRACTFORM AND CONDITIONS OF CONTRACT

Section 7: Contract Form and Conditions of Contract

This Section includes standard contract form. It includes General Conditions of Contract ("GCC") and Special Conditions of Contract ("SCC"). The SCC include clauses specific to this contract to supplement the General Conditions.

PART III – Contract Related Forms

Section 8: Contract Related Forms

This Section includes the form used to notify Award of the Contract to the successful bidder and the form for Performance Security to be furnished by the bidder.

ABBREVIATIONS

1.	**AMI**	Advanced Metering Infrastructure
2.	**ACI**	Available Capital for Investment
3.	**AMISP**	Advanced Metering Infrastructure Service Provider
4.	**BG**	Bank Guarantee
5.	**BIS**	Bureau of Indian Standards
6.	**BoM**	Bill of Material
7.	**C&I**	Commercial and Industrial
8.	**CAIDI**	Consumer Average Interruption Duration Index
9.	**CAIFI**	Consumer Average Interruption Frequency Index
10.	**CEA**	Central Electricity Authority
11.	**CERT-In**	Indian Computer Emergency Response Team
12.	**CIM**	Common Information Model
13.	**CIS**	Consumer Information System
14.	**CMMI**	Capability Maturity Model Integration
15.	**CPU**	Central Processing Unit
16.	**CRM**	Consumer Relationship Management
17.	**CT**	Current Transformer
18.	**CUM**	Cumulative
19.	**CV**	Curriculum Vitae
20.	**DBFOOT**	Design Build Finance Own Operate and Transfer
21.	**DBMS**	Database Management System
22.	**DCU**	Data Concentrator Unit
23.	**DMZ**	Demilitarized Zone
24.	**DT**	Distribution Transformer
25.	**ESB**	Enterprise Service Bus
26.	**FAT**	Factory Acceptance Test
27.	**FOR**	Freight on Road
28.	**GIS**	Geographic Information System

29.	**GPRS**	General Packet Radio Service
30.	**GPS**	Global Positioning System
31.	**GST**	Goods and Services Tax
32.	**GUI**	Graphical User Interface
33.	**HES**	Head-End System
34.	**HHU**	Handheld Unit
35.	**IBMS**	Integrated Building Management Systems
36.	**IDS**	Intrusion Detection Systems
37.	**IEC**	International Electro technical Commission
38.	**IP**	Internet Protocol
39.	**IPR**	Intellectual Property Rights
40.	**IS**	Indian Standard
41.	**ISO**	International Organization for Standardization
42.	**ISP**	Internet Service Provider
43.	**IT**	Information Technology
44.	**IVRS**	Interactive Voice Response System
45.	**kVA**	kilo Volt-Ampere
46.	**kW**	kilo Watt
47.	**LAN**	Local Area Network
48.	**LCD**	Liquid Crystal Display
49.	**LED**	Light Emitting Diode
50.	**LT**	Low Tension
51.	**M&V**	Monitoring and Verification
52.	**MCB**	Miniature Circuit Breaker
53.	**MD**	Maximum Demand
54.	**MDAS**	Meter Data Acquisition System
55.	**MDM**	Meter Data Management
56.	**MICC**	Mineral-Insulated Copper-Clad Cable
57.	**MPPKVVCL**	Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited

57.	**NAN**	Neighborhood Area Network
58.	**NIC**	Network Interface Card
59.	**NMS**	Network Management System
60.	**NOMC**	Network Operation cum Monitoring Center
61.	**NTP**	Network Time Protocol
62.	**OEM**	Original Equipment Manufacturer
63.	**OS**	Operating System
64.	**OSF**	Open Software Foundation
65	**P&L**	Profit & Loss
66.	**PCI**	Payment Card Industry
67.	**PLC**	Power Line Communication
68.	**PLCC**	Power Line Carrier Communication
69.	**PO**	Purchase Order
70.	**PON**	Power Outage Notification
71.	**PRN**	Power Restoration Notification
72.	**PT**	Potential Transformer
73.	**PV**	Photovoltaic System
74.	**QA**	Quality Assurance
75.	**QC**	Quality Control
76.	**QR**	Qualification Requirement
77.	**RAM**	Random Access Memory
78.	**RDBMS**	Relational Database Management System
79.	**RF**	Radio Frequency
80.	**RFP**	Request for Proposal
81.	**RPO**	Recovery Point Objective
82.	**RTC**	Real Time Clock
83.	**RTO**	Recovery Time Objective
84.	**SAIDI**	System Average Interruption Duration Index
85.	**SAIFI**	System Average Interruption Frequency Index
86.	**SAN**	Storage Area Network

87.	**SAT**	Site Acceptance Test
88.	**SCADA**	Supervisory Control and Data Acquisition
89.	**SEBI**	Securities and Exchange Board of India
90.	**SI**	System Integrator OR System Integration
91.	**SLA**	Service Level Agreement
92.	**SNMP**	Simple Network Management Protocol
93.	**SOA**	Service Oriented Architecture
94.	**SQL**	Structured Queried Language
95.	**TCP**	Transmission Control Protocol
96.	**TOD**	Time of Day
97.	**TOU**	Time of Use
98.	**UDP**	User Datagram Protocol
99.	**UPS**	Uninterrupted Power Supply
100.	**Utility**	(MPPKVVCL, Indore
101.	**VEE**	Validation Estimation and Editing
102.	**VM**	Virtual Machine
103.	**VoIP**	Voice over Internet Protocol
104.	**WAN**	Wide Area Network
105.	**WO**	Work Order
106.	**WPC**	Wireless Planning & Coordination Wing
107.	**XML**	Extensible Mark-up Language

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PART I

BIDDING PROCEDURES AND REQUIREMENTS

Section – 1:Request for Proposal Notice

Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis through E-reverse auction mode only"

PROCUREMENT NOTICE

(Single Stage Two-Envelope Bidding Process with e-Procurement Through E-Reverse Auction)

GLOBAL OPEN COMPETITIVE PROCUREMENT

Contract Title: "Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis through E-reverse auction mode only"

Request for Proposal (RFP)/ Tender Number:

MD/WZ/06/PUR/TS-1942

(NIT No. MD/WZ/06/PUR/NIT-328/4402 Indore Dated 02/03/2026 & Amendment in NIT-328 issued vide No. MD/WZ/06/PUR/NIT-328/4402 Indore Dated 13.03.2026)

1. Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited (hereinafter also referred to as 'Utility') (hereinafter also referred to as 'Utility') invites online Proposals for "**Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis through E-reverse auction mode only** ". Bidders are advised to note the clauses on Eligibility and Qualification Requirements in Section-2 and Evaluation Criteria in Section-3 of the RFP Document for evaluation of Proposals.

2. Bidding for selection of AMI Service Provider will be conducted through global open competitive procurement through e-Reverse auction.

3. The RFP Document is available online on www.mptenders.gov.in from 14.03.2026 on payment of cost of document (Tender Fee) as indicated in the TABLE below. The prospective Bidders would be responsible for downloading the RFP Document and ensuring that any addenda/ corrigendum/ amendment/ clarification there to available on the website is also downloaded and incorporated.

4. The bidding shall be conducted **under Single Stage Two-Envelope Bidding process with e-Procurement followed by e-Reverse auction** as specified in Section 3. MD/WZ/06/PUR/TS-1942

5. Under the Single Stage Two-Envelope Bidding process, the Bidder shall not quote, disclose, or submit its price in the Technical Proposal (First Envelope) or in any other manner, whatsoever, except as part of the Financial Proposal (Second Envelope). In case of any non-compliance in this regard, the Proposal shall be out-rightly / summarily rejected.

6. An incomplete and/or ambiguous and/or conditional Proposal and/or Proposal submitted late is liable to be ignored/ summarily rejected.

7. Proposal must be submitted online through the e-Procurement/ e-Tendering process specified in Section 3. Any Proposal or modifications to Proposal received outside the e-Procurement system will not be considered, unless otherwise specified in Section 3. Utility shall not be held liable for any delays due to e-Procurement/ e-Tendering system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, Utility shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this RFP.

8. Important dates, amounts and other details pertaining to this RFP Notice including submission and opening of proposal, cost of documents/ Tender Fee, address for communication, etc., are given in the TABLE below.

9. If Utility office happens to be closed on the specified date of opening of the Proposals, the Proposals/ bids will be opened on the next working day at the same time and venue or as may be notified by Utility.

10. Other details can be seen in the RFP document.

TABLE
Important Dates, Amounts and Other Details

Dates

			Date	Time
a)	Commencement of downloading of this RFP and e-bidding	:		
b)	Pre-bid meeting	:	23.03.2026	15:00
c)	Last date for e-bidding	:	06.04.2026	15:00
d)	Last date for receipt of RFP	:		
e)	Date of Opening of Technical Bid (if possible)	:	07.04.2026	15:00
f)	Evaluation of Technical Bid and Opening of Financial Bid	:		
g)	Issue of Letter of Award (LOA)	:		
h)	Execution of AMISP Contract	:		

Amounts for Bidding

A.	Tender Fee to be submitted with the RFP(Non-Refundable)	:	INR 10000+ Processing fees	
B.	Bid Security (Refundable)	:	Bid security (Refundable): INR 1,00,000 (to be paid online)	
C.	Other Payments or Bank Guarantees for the AMISP shall be as per the terms and conditions defined in this RFP			

Other Details

A.	Address for Communication including Contact details: CE (Purchase): Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited Regd. Office :; GPH COMPOUND, POLOGROUND, INDORE

B.	Payment of cost of document/ Tender Fee: 1. Tender documents can be purchased only online and downloaded fromhttps://mptenders.gov.in by making online payment of prescribed non-refundable tender fees. Only in case if the tender is dropped without opening, the tender fees shall be refunded after deduction of necessary portal charges. Manual purchase of tender is not allowed. The tender fee is inclusive of all applicable taxes. 2. The name of the Lead Consortium Member along with all of its consortium partners or Sole Bidder submitting the Bid, (as further detailed in Section 3) shall also be clearly mentioned through the covering letter & to be uploaded along with details of tender fees & EMD to be submitted online. 3. Any Bid not accompanied by a Tender Fee as above shall be rejected by Utility as non-responsive. 4. Tender Fee is non-refundable
C.	Other Payments or Bank Guarantees for the RFP/ Contract shall be as per the terms and conditions defined in this RFP Document

Section – 2: Eligibility and Qualification Requirements

1. The Bid can be submitted by a Sole Bidder as an individual entity or a Consortium of firms/companies (specific requirements for Consortium are given under Clause 4 below) who are eligible to participate in tenders for public procurement in India in accordance with Applicable Laws including the guidelines issued in Order No. F/No.6/18/2019-PPD by Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23 July 2020,Order No No.9/16/2016-Trans-Part (2) dated 18 November 2020, latest Government of India Guidelines for Make in India, Domestically manufactured products, Atmanirbhar Bharat and circulars DIPP Office Memorandum No. P-45021/2/2017-PP (BE-II) date:16th Sept. 2020, MeitY Circular No.1(10)/2017-CLES dated 06.12.2019 and Order No. 11/05/2018-Coord. by the Ministry of Power dated 17 September 2020 including any amendments or modifications to the same from time to time.

2. If at any stage of the bidding, any order/ ruling is found to have been passed in the last 1 (one) year preceding the Bid submission deadline by a competent Court of Law or any appropriate Commission or any Arbitral Tribunal against the Sole Bidder/ Lead Bidder/ any Consortium Members or its Affiliates for breach of any Contract awarded by any Government agency/department, then Bids from such Bidders shall be liable to be rejected. All Bidders shall confirm in accordance to Form 7 given in Section 4 that no such order(s)/ ruling(s) have been passed by a competent Court of Law or an appropriate Commission against it or its Affiliates. In case of any such order/ ruling, it is the duty of the Bidder to inform Utility for the same during the Bid submission.

3. Technically qualified Bidders shall continue to maintain compliance with the Eligibility and Qualification Requirements specified herein. Failure to comply with the aforesaid requirements shall make the Bid from such Bidders liable for rejection at any stage of the bidding process.

4. **Eligibility Requirements for Consortium**

4.1 Members of the Consortium shall enter into a binding Consortium Agreement, in the form specified at Form 8 (the "Consortium Agreement") given in Section 4 of RFP Document, for the purpose of submitting Bid. The Consortium Agreement, to be submitted along with the Bid, shall, inter alia:

(a) convey the intent to comply with the terms and conditions of the AMISP Contract in the event selected to undertake the Project; and

(b) clearly outline the proposed roles and responsibilities, if any, of each member.

4.2 In the event Selected Bidder is a bidding Consortium, except in the case when a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is the lead consortium member, then the members of the consortium shall be required to form an appropriate Special Purpose Vehicle, incorporated under the Companies Act 2013 (the "**SPV"**), to execute the AMISP Contract and implement the Project. In such a case, the Selected Bidder shall comply with the following requirements:

4.2.1 The members of the consortium shall ensure that they subscribe to 100% of the equity share capital of the SPV. The members of the Consortium shall hold shares in accordance with the shareholding pattern indicated in the Consortium Agreement for a period up to two years after the Installation Milestone;

4.2.2 The members of the consortium shall continue to hold not less than 51% for the entire term of the AMISP Contract;

4.2.3 The Lead Consortium Member shall hold at least 51% (fifty-one per cent) of the equity of the SPV at all times until two years from Installation Milestone as per the AMISP Contract and 26% for the remaining term of the AMISP Contract.

4.2.4 If equity is held by the Affiliates, Parent Company or Ultimate Parent Company, then subject to this Clause, such Affiliate, Parent Company or Ultimate Parent Company shall be permitted to transfer its shareholding in the SPV to another Affiliate or to the Parent Company / Ultimate Parent Company. If any such shareholding entity, qualifying as an Affiliate / Parent Company / Ultimate Parent Company, is likely to cease to meet the criteria to qualify as an Affiliate / Parent Company / Ultimate Parent Company, the shares held by such entity shall be transferred to another Affiliate / Parent Company / Ultimate Parent Company.

Provided that in case the Lead Member or Sole Bidder is holding equity through Affiliate's, Ultimate Parent Company or Parent Company, such restriction shall apply to such entities.

Provided further, that the aggregate equity share holding of the Bidding Consortium or a Sole Bidder in the issued and paid-up equity share capital of the SPV shall not be less than hundred percent (100%) up to a period of two (2) years after Installation Milestone and the lead Consortium Member shall have the equity share holding not less than fifty one percent (51%). In case the Selected Bidder is a Bidding Consortium, then any Member (other than the Lead Member) of such Bidding Consortium shall be allowed to divest its equity as long as the other remaining Members (which shall always include the Lead Member) hold the minimum equity specified above.

4.2.5 The Selected Bidder may invest in the equity share capital of the SPV through its Affiliate(s) or Ultimate Parent Company or Parent Company. Details of such investment will have to be specified in the Technical Bid of the RFP. If the Selected Bidder so invests through any Affiliate(s) or Ultimate Parent Company or Parent Company, the Selected Bidder shall be liable to ensure that minimum equity holding/lock-in limits as specified in Clause 4.2 above and as computed as per the provisions of Clause 4.2.6 of this section are still maintained.

4.2.6 For computation of effective Equity holding, the Equity holding of the Selected Bidder or its Ultimate Parent Company in such Affiliate(s) or Parent Company and the equity holding of such Affiliate (s) or Ultimate Parent Company in the SPV shall be computed in accordance with the example given below:

If the Parent Company or the Ultimate Parent Company of the Selected Bidder A directly holds thirty percent (30%) of the equity in the SPV, then holding of Selected Bidder A in the SPV shall be thirty percent (30%);

If Selected Bidder A holds thirty percent (30%) equity of the Affiliate and the Affiliate holds fifty percent (50%) equity in the SPV, then for the purposes of ascertaining the minimum equity/equity lock-in requirements specified above, the effective holding or Bidder A in the SPV shall be fifteen percent (15%). (i.e., 30%*50%);

4.3 The Lead Bidder / Sole Bidder shall have a registered office (under the Companies Act 1956/ 2013 with Registrar of Companies) in India at the time of submission of the Bid. In case of Award of Contract, other Consortium Members shall be required to have a registered office (under the Companies Act 1956/ 2013 with Registrar of Companies) in India.

4.4 Every Consortium 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. (if applicable) entered amongst all members of that Bidding Consortium including but not limited to those as prescribed in Form 8, Form 9 and Form 11 given in Section 4. In the absence of duly executed formats, the Bid shall not be considered for evaluation and shall be rejected.

4.5 The Lead Consortium Member shall be liable for the execution of the entire obligation in the AMISP Contract in accordance with the terms and conditions thereof. Only the Lead Consortium Member shall have the authority to conduct all businesses for and on behalf of the Consortium during the bidding process.

5. The Bidder, participating in the bid as a Sole Bidder, or as a Consortium Member or as Lead Consortium Member of a Bidding Consortium, and its Sub-Contractor(s) should not be blacklisted/ debarred/ banned/ suspended as on date of bid submission:

a) due to conviction of an offence
   i. under the Prevention of Corruption Act, 1988; or,
   ii. the Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing threat to public health as part of execution of a public procurement contract
b) through any order/ list issued by Department of Expenditure (DoE), Ministry of Finance (MoF)
c) due to breach of code of integrity as per Rule 175 of GFRs 2017 in any Govt. Organization or regulatory agencies or Govt. undertaking.
d) by any Ministry/ Department/ Organization under the State Govt. of Madhya Pradesh.

This clause shall be interpreted in-line with Rule 151 of GFRs, 2017 along with any guidelines/ amendment issued by DoE, MoF. Bidder should submit a self-undertaking signed by its authorized signatories for the same as per the format prescribed in Form 7 given in Section 4."

6. The Lead Consortium Member/ Sole Bidder shall submit the Bid after submitting the Tender Fees and Bid Security as per the various terms, schedules and formats prescribed in this RFP. Further, The Lead Consortium Member shall be the point of contact for the Consortium during the Bid process before award of the Project to the AMISP, and Utility shall communicate directly to the contact person appointed through the Power of Attorney as per Form 10 given in Section 4.

7. The Bidder may seek qualification on the basis of technical and financial capability of its Parent(s) and/ or its Affiliate(s), as defined in section 3, 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). A Bidder shall submit only one Bid in the same bidding process, either individually as a Sole Bidder or as a Lead Member of a Bidding Consortium. Any member of the bidding consortium, including its Parent(s) and/or Affiliate(s), whose technical and financial capabilities are showcased for meeting the criteria as mentioned in Clause 8.1 of Section 2, shall not separately participate directly or indirectly in another bid in the same bidding process for meeting the criteria as mentioned in Clause 8.1 of section 2.

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 Bid Submission Deadline. Documentary evidence to establish such relationship shall be furnished by the Bidder along with the Technical Bid.

If the Technically Evaluated Entity and/or Financially Evaluated Entity is an entity other than the SoleBidder or a Member in a Bidding Consortium, the SoleBidder or Member relying on such Technically Evaluated Entity and/or Financially Evaluated Entity will have to submit a legally binding undertaking supported by a board resolution from the Technically Evaluated Entity and/or Financially Evaluated Entity or its Ultimate Parent Company, that all the equity investment obligations of the SoleBidder or the Member of the Consortium shall be deemed to be equity investment obligations of the Technically Evaluated Entity and/or Financially Evaluated Entity or its Ultimate Parent Company, and in the event of any default the same shall be met by such evaluated entity or by the Ultimate Parent Company. The SoleBidder or the Consortium Member shall have to provide information and documents relating to its relationship with such Technically Evaluated Entity and or Financially Evaluated Entity including details about the equity shareholding between them as per Form 16 provided in Section 4.

The Technically Evaluated Entity may be the SoleBidder or the Lead Member of a Consortium or an Affiliate or Parent of such SoleBidder or the Lead Member, as the case may be.

The Qualified Bidder(s) will be required to continue to maintain compliance with the Qualification Requirements throughout the bidding process and till execution of the AMISP Contract. Where the Technically Evaluated Entity and/or the Financially Evaluated Entity is not the SoleBidder or a Member in a Bidding Consortium, as the case may be, theSoleBidder or Member shall continue to be an Affiliate of the Technically Evaluated Entity and/or Financially Evaluated Entity till the execution of the AMISP Contract. Failure to comply with the aforesaid provisions shall make the Bid liable for rejection at any stage.

8. Qualification Requirements

8.1 The technical and financial requirements of qualification are as follows:

S. No.	Requirements	Supporting Documents
Technical Requirements		
1.	Sole/ Lead Bidder must have either: (a) paid for, or received payments for, construction of Eligible Project(s); ***Or*** (b) paid for development of Eligible project(s) in the Infrastructure sector in the last 7 (seven) Financial Years with aggregate project value of not less than INR[50% of the Estimated Project Cost]	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *In case Non-Disclosure agreement (NDA) is signed*

S. No.	Requirements	Supporting Documents
2.	Sole/ Lead Bidder/ any other Consortium Member must have experience of integration of head-end system with MDM on standard interfaces and data exchange models for at least [50% of RFP] consumers / end points (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last 7 (seven) years which are in operation for at least 1 (one) year. ***Or*** Sole/ Lead Bidder/ any other Consortium Member should have installed, integrated, tested, and commissioned control center hardware (or on cloud) and application software for at least [100% of RfP] endpoints (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in last 7 (seven) years which are in operation for at least 1(one) year	*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) Any other documentation for implementation performance/ operation
3.	The Sole/ Lead Bidder should have a valid pre-qualification and technical empanelment certificate for the required communication technology, issued by REC and approved by the committee constituted vide the letter issued by the Ministry of Power F.No.14/02/2021-UR&SI-II-Part(1)-(E-258136) dt. 10th January 2022, at the time of bid submission.	Valid Empanelment certificate of the sole/ lead bidder for the proposed solution, issued by REC / committee constituted thereby
Financial Requirements		
4.	The Bidder shall have positive net worth for each of the last three financial years.	Audited Annual financial statements, Balance Sheet and P&L Account for the respective

S. No.	Requirements	Supporting Documents
	The Net worth of the Bidder should be at least [30]% of the estimated Project cost in any of the last three Financial Years (2021-22, 2022-23, and 2023-24).***Or*** Bidder shall have a minimum ACI of [30]% of the estimated Project cost at the close of the preceding financial year. (FY 2023-24) *[Net Worth means sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account for current year) and intangible assets.]*. *[ACI means minimum investible funds (i.e., immediately available funds for investment and callable capital) subject to the limits of investment in a single investee entity (in the relevant jurisdiction for a Foreign Investment Fund, or the maximum permissible investment limit for an AIF) (as per the SEBI (AIF) Regulations, 2012, as may be amended from time to time), as applicable]*. Please note: a. In case a Bidder and/(or) it's Parent(s)/ Affiliate(s) has issued any fresh equity capital during the current financial year, the same shall be permitted to be added to the Bidder's Net Worth subject to the statutory auditor of the Bidder certifying to this effect. b. In case a Bidder and/(or) it's parent(s)/ Affiliate(s), being a SEBI registered AIF or Foreign Investment Fund, has received any fresh capital commitment available for the immediate deployment during the current financial year, the same shall be permitted to be added to the Bidder's ACI	Financial Years as per the format prescribed in Form 12 given in Section 4

S. No.	Requirements	Supporting Documents
	subject to the statutory auditor of the Bidder certifying to this effect.	

8.2 The Sole/ Lead Bidder would have to clearly include and mention the details of all the solution / component providers given below. However, such solution / component providers may or may not necessarily be included as a part of the Bidding Consortium. For avoidance of doubt, it is clarified that the sole bidder/ any member of the bidding consortium can also be a solution/ component provider, provided that they meet the relevant qualification requirements as mentioned below. The Sole / lead bidder has to mandatorily mention at least one vendor for each of the solution/ component providers given below in Form 1 of section 4:

a) Smart Meter Manufacturer(s)
b) Head End System (HES) solution provider
c) Meter Data Management System (MDMS) solution Provider
d) System Integrator 8
e) RF Communication Provider (if applicable)

Accordingly, in addition to the requirements provided in 8.1, the various solution / component providers should also separately meet the following requirements as on date of bid submission or as on date of replacement of solution/ component provider post award of contract, subject to necessary approval in writing from the utility. Each of the solution / component providers shall sign an agreement with the sole/ lead bidder, provided the solution/ component provider is not the sole/ lead bidder, in the format as specified in Form 23 of section 4, clearly mentioning:

a) their intent to comply with the terms and conditions of the AMISP Contract in the event the solution/ component provider is selected to undertake the Project
b) their willingness to work with the said sole/ lead bidder; and
c) their proposed roles and responsibilities.

S. No.	Requirements	Supporting Documents
A. Meter Manufacturer – Technical Requirements		
A1.	**<u>Option 1:</u>** Should have manufactured and supplied minimum [1,00,000] nos. of Smart meters (cumulative) on proposed communication technology in Indian/Global Power Distribution Utility in the last 7 (seven) years. **<u>Option 2:</u>** Should have manufactured and supplied minimum [20,00,000] nos. of static electricity meters (cumulative) in Indian/Global Power Distribution Utility in the last 7 (seven) years. **<u>Option 3:</u>**	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13); *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*

	Any meter manufacturer who doesn't satisfy Option 1 & 2 but satisfies conditions (A2), (A3) & (A4) below, can also be eligible to participate in the bid as a meter manufacturer. However, meters procured for this tender from this particular meter manufacturer/ supplier, shall be limited to [25%] of the total meters proposed to be implemented as part of this tender.	*experience along with Client Name/ Email Address/ Contact no./ designation etc.* b) Documentary evidence of completion of the Project or other documentary evidence indicating completion of supply (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) Any other documentation for implementation performance/ operation
A2.	Smart meters shall have all the valid test certificate (issued within the last 5 years) and BIS certificate, compliant to relevant standards i.e., IS 16444* *Note: *At the time of supply of LT-CT operated Meters and HT meters, the smart meters shall have all the valid test certificate and BIS Certificate, compliant to IS 16444.*	Valid BIS and type-test certificate to be submitted
A3.	Should have in-house NABL or ISO/ IEC - 17025 accredited Laboratory capable of testing smart meters as per relevant standards i.e., IS 16444.	A valid registration certificate mentioning issue/renewal/expiry date.
A4.	Should have a valid ISO 9001:2015 certification	Copy of valid certificate
A5.	Compliance to Make in India provisions notified vide MoP, GoI order dated 3rd July-23 & 20th Feb-24 and any subsequent amendment from time to time as on date of Bid submission	Self-certification on Meter Manufacturer's Letter head duly signed by authorized signatory.
A6.	Should have CMMI (Capability Maturity Model Integration) Level 3 or IEC/ISO 27001 latest published certifications.	Copy of valid certificate
B. Head End System (HES) solution provider – Technical Requirements		
B1.	The HES solution should have been successfully integrated with at least 2 (two) different MDMS/ other utility IT Solution in	Certificate / report issued by Client / MDMS OEM / solution provider. *In case the HES solution provider has integrated with their own MDMS,*

	Indian/ Global Utility (ies) (power/ water/ natural gas/ telecom) in last 7 (seven) years.	*then a self-certification shall be provided.*
B2.	Compliance to Make in India provisions notified vide MoP, GoI order dated 30th Dec-24 along with corrigendum dated 31st Dec-24 and any subsequent amendment from time to time as on date on bid submission.	Self-certification on HES solution provider's letter head duly signed by authorized signatory.
B3.	Should have CMMI (Capability Maturity Model Integration) Level 3 or IEC/ISO 27001 latest published certifications.	Copy of valid certificate
B4.	The Proposed HES should have been implemented for at least [50% RfP] consumers / end points (cumulatively) in an Indian / global utility (power / Water / Natural Gas / Telecom) in the last 7(seven) years which are in operation as on date of Bid Submission	Certificate / report issued by Client
C. Meter Data Management System (MDMS) solution provider - Technical Requirements		
C1.	The proposed MDM solution should have been successfully integrated with at least 2 (two) nos. of different HES solutions in Indian/ Global Utility(ies) (power/ water/ natural gas telecom) in last 7 (seven) years.	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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
C2.	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.	

		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.
C3.	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
C4.	Compliance to Make in India provisions notified vide MoP, GoI order dated 30th Dec-24 along with corrigendum dated 31st Dec-24 and any subsequent amendment from time to time as on date on bid submission.	Self-certification on HES solution provider's letter head duly signed by authorized signatory.
D. System Integrator – Technical Requirements		
D1.	Should have experience of integration of HES/MDMS etc. with at least 2 (two) billing / other utility IT systems in Indian/ Global Utility (ies) (power/ water/ natural gas/ telecom) in last 7 (seven) years, in which the meters are in operation for at least 1(one) year.	Certificate / report issued by Client / Billing system solution provider.
D2.	• Should have valid ISO 9001:2015 certification • Should have IEC/ ISO 27001 certification or CMMi Level 3 (or above) certifications	Copy of valid certificate
E. RF Technology/ Solution Provider – Technical Requirements *(If applicable)*		
E1.	The RF technology/ Solution provider should have implemented project/(s) with at least [50,000] (cumulatively) modules / endpoints involving Radio Frequency (RF) mesh in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last 7 (seven) years.	a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of

		work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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) Any other documentation for implementation performance/ operation.
E2.	The RF Technology/ Solution provider should have been in the communications network installation / maintenance services business for the last 1 (one) year in India. OR The RF Technology/ Solution provider should have been in the communications network installation / maintenance services business for the last 3 (three) years outside of India.	a) Certificate of Incorporation and Registration certificate along with Memorandum & Articles of Association. b) Copy of valid Licenses (In case of RF, Valid certificate issued by Wireless Planning & Coordination (WPC) Wing of the Ministry of

		Communications, GOI) as on date of bid submission.
E3.	The RF Technology/ Solution provider have successfully integrated their NIC/ Communication module with at least 3 (three) different makes of smart meters in India or Outside of India.	Signed agreements/ MoUs for integration of NIC module or Certificate of successful integration.

8.3. For the purposes of satisfaction of Technical Requirement, the following shall apply:

a) Eligible Projects, as referred in Technical Requirement, shall mean works contracts for developing asset/ facility in India or abroad which involve building/ installing, and commissioning/ go-live such asset/ facility but shall not include any assignment where the scope is limited to only (i) supply of goods or (ii) supply of manpower.

b) Projects that have achieved completion/ or have achieved commissioning/ go-live as identified in the Project document(s) at least 7 (seven) Days prior to the Bid Submission Deadline shall be considered.

c) The Technically Evaluated Entity must have either executed itself/ paid for such projects or must own at least 26% of the shareholding in the company that has executed the project(s) up to the date of commissioning of such project.

d) For the purpose of clause, 8.1 above, Infrastructure sector is defined under Definitions in Section 3. In reference to this, Energy efficiency projects in Electricity distribution sector shall also be considered.

e) For the purpose of clause, 8.1 &8.2 (A) to (E) above, the Eligible Project(s) in the:
   i. Power sector shall mean projects relating to generation or transmission or distribution of electricity;
   ii. Water sector shall mean projects relating to water treatment including desalination or water supply (rural or urban) or wastewater / sewerage or drainage or water pipelines;
   iii. Natural gas sector shall mean projects relating to natural gas transmission or distribution; and
   iv. Telecom sector shall mean projects relating to infrastructure cabling or communication systems for setting up Wide Area Network (WAN) or Local Area Network (LAN) or Internet Services or VOIP solutions, etc.

f) The AMISP shall get the vendor approval of meter manufacturer (OEM) from the Discom before supply of meters. The AMISP shall submit the type test certificate of Smart Meters as per IS: 16444, Meter's CBIP-325 Test Report and get the approval from Utility/ Purchaser before supply of Smart Meters. The Bidder shall submit BIS/Type test/NABL certificate for those make of meters which they are going to install along with OEM authorisation form. In case during implementation phase, AMISP wants to include meter of other make then he has to submit BIS/Type test/NABL certificate for that make. In the event of Order, the successful Bidder has to submit CBIP-325 test reports of the offered Smart Meters before commencement of Supply.

8.4. For the purposes of satisfaction of Financial Requirement, the following shall apply:

a) In the event Bidder is a Consortium, the financial requirement shall be met individually and collectively by all the Members in the Bidding Consortium. The financial requirement to be met by each Member of the Bidding Consortium shall be as detailed below:
   (i) The Lead Consortium Member/ Lead Bidder shall meet not less than 51% of the minimum financial requirement criteria given at clause no.8.1 (4) above.

(ii) and each of the other Consortium Member(s) individually shall meet not less than 5% of the minimum financial requirement criteria given at clause no. 8.1(4) above.

Section – 3: Instructions to Bidders and Bid Data Sheet

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Instructions to Bidder

A. General Provisions

1. **Definitions**	**1.1 Definitions** (a) "**Affiliate**" shall mean a company or AIF or Foreign Investment Fund that either directly or indirectly: controls or is controlled by or is under common control with a Bidder and "control" mean either(i) ownership by one company or AIF or Foreign Investment Fund of 26% of the voting rights of the other company or AIF or Foreign Investment Fund, as the case may be or (ii) an AIF or Foreign Investment Fund that has the power to direct the management and policies by operation of law or contract; (b) **"Alternative Investment Fund" or "AIF""** shall have the meaning as ascribed to the term 'alternative investment fund' under Regulation 2(1)(b) of the Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012 (as may be amended from time to time) (c) **"ACI"** shall mean minimum investible funds (i.e. immediately available funds for investment and callable capital, net of estimated expenditure for administration and management of the fund) subject to the limits of investment in a single investee entity (in the relevant jurisdiction for a Foreign Investment Fund, or the maximum permissible investment limit for an AIF) (as per the Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012, as may be amended from time to time). In case of an AIF or Foreign Investment Fund using ACI, ACI would be considered as per the certificate issued by statutory auditor (or such other certificate as filed with the regulator in the relevant jurisdiction) not older than 1 (one) months prior to the date of Bid Submission; (d) **"AMISP Service Charge"** shall mean the payment to be made by the Utility to the AMISP in INR per meter per month for each category of meter as quoted in the Bid; (e) **"AMISP Contract" or "Contract"** shall mean the Contract to be entered into between the Selected Bidder in the event the Selected Bidder is an individual entity, Lead Bidder in the event the Selected Bidder is a Consortium and*the SPV, incorporated by the Selected Bidder in the event formation of SPV is mandatory/ opted and permitted as per* ***Bid Data Sheet***[1] and the Utility, for undertaking the Project;

[1]Lead Bidder in the event the Selected Bidder is a Consortium

(f) **"Bid"** shall mean the bid submitted by a Bidder(s) in response to this RFP and shall include the Technical Bid and the Financial Bid;

(g) **"Bidder(s)"** shall mean individual entity or Consortium of entities bidding in response to this RFP. The Bidder can either be a company incorporated under the applicable laws of their relevant jurisdiction or an AIF or a Foreign Investment Fund;

(h) **"Bidding Consortium"** shall mean the Consortium of entities bidding for Project after executing Consortium Agreement as per the terms and conditions of this RFP;

(i) **"Bid Data Sheet (BDS)"** means an integral part of the **Instructions to Bidders (ITB)Section 3**, that is used to reflect issues, details and conditions specific to the procurement, to supplement and/or modify the provisions of ITB.

(j) **"Bid Submission Deadline"** shall have the meaning as ascribed thereto in **ITB 17.5**;

(k) **"Conflict of Interest"** shall have the meaning as ascribed thereto in **ITB 3**;

(l) **"Consortium Member"** shall mean any Member of the Bidding Consortium other than the Lead Consortium Member

(m) **"Contractor"** shall mean the same as "AMISP";

(n) **"Contract Price"** shall have the meaning as ascribed thereto in Section 7;

(o) **Day"** means a calendar day, unless otherwise specified as **"Business Day".** A Business Day is any day that is an official working day of Utility. It excludes Utility's official public holidays.

(p) **"Financial Bid"** shall have the meaning as ascribed thereto in **ITB 16**;

(q) **"Financially Evaluated Entity"** shall mean the company which has been evaluated for the satisfaction of the financial requirement set forth in Clause 8 of Section 2;

(r) "**Financial Proposal"** shall mean the same as Financial Bid;

(s) **"Financial Year" or "FY"** shall mean the period starting from 1st April of a calendar year to 31st March of the consecutive calendar year;

(t) **"Foreign Investment Fund"** shall mean any pooled investment vehicle or investment fund which is registered or recognized with a securities market/banking regulator of a "foreign jurisdiction";

(u) **"Foreign Jurisdiction"** means a country, other than India, whose securities market regulator is a signatory to International Organization of Securities Commission's Multilateral Memorandum of Understanding (IOSCO's MMOU) or a signatory to bilateral Memorandum of Understanding with the Securities and Exchange Board of India, and which is not identified in the public statement of Financial Action Task Force as a jurisdiction having a strategic Anti-Money Laundering or Combating the Financing of Terrorism deficiencies to which counter measures apply or a jurisdiction that has not made sufficient progress in addressing the deficiencies or has not committed to an action plan developed with the Financial Action Task Force to address the deficiencies and are allowed to make investment India in terms of applicable law;

(v) **"ITB"** (this Section 3 of the RFP) means the Instructions to Bidders that, along with other Sections, provides the Bidders with all information needed to prepare their Proposals.

(w) **"Lead Consortium Member" or "Lead Bidder"** shall mean the Member of the Bidding Consortium, designated as such by the other members of the Consortium, having authority to represent all the members before the Utility;

(x) **"Meter-months":** At any point of time, meter-months of the AMI system 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 AMISP, taking into account all Change Orders issued by the Utility;

(y) "**Month**" shall mean calendar months unless otherwise specified.

(z) **"Operational Go-live"** shall have the meaning as ascribed thereto in Clause 9.6 of Section 6 of the RFP Document;

(aa) "**Parent(s)"** shall mean an entity that is either (i) a Company or an AIF or a Foreign Investment Fund that holds at least twenty six percent (26%) of the paid - up equity capital directly or indirectly in the Bidder, as the case may be; or (ii)an AIF or Foreign Investment Fund that has the power to direct the management and policies by operation of law or contract;

(bb) **"Project"** shall mean the Utility's AMI Project defined in Clause 1 of Section 6 of the RFP Document;

(cc) **"Proposal"** shall mean the same as Bid and shall include the Technical Proposal and the Financial Proposal;

(dd) **"Request for Proposal" or "RFP"** means this Tender of which the number, name and details have been mentioned in **Bid Data**

	Sheet, including all its Volumes/ Sections/ Forms/ Annexures/ Appendices etc., for Appointment of AMISP (including all clarification/ addendum/ amendment/ corrigendum/ etc. issued from time to time); (ee) "**RFP Document**" shall have the same meaning as ascribed thereto in ITB 2.1 and ITB 2.1.1 (ff) **"Service(s)" or "Related Service(s)"** shall mean any Service(s) performed or to be performed as a part of the Project by the AMISP; (gg) **"Special Purpose Vehicle" or "SPV"** shall mean a company incorporated under Companies Act, 2013 for the purpose of executing the Project as set out in Clause 1 of Section 6; (hh) **"Sub-Contractor"** shall mean any person, natural or legal, including manufacturers, to whom execution of any part of the AMISP Contract, including preparation of any design or supply of the AMI Project, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns; (ii) **"Technical Bid"** shall have the meaning as ascribed thereto in **ITB 15**; (jj) **"Technical Proposal"** shall mean the same as Technical Bid; (kk) **"Technically Evaluated Entity"** shall mean the company which has been evaluated for the satisfaction of the technical requirement set forth in Clause 8 of Section 2; (ll) **"Tender"** shall mean the same as "RFP"; (mm) **"Tender Fee"** shall mean the fees submitted with the RFP; (nn) **"Total Meter-months":** Total Meter-months of the AMI system is calculated as the product of total number of smart meters installed, integrated and operationalized in the Project (by taking into account all Change Orders issued by the Utility) and 93 (ninety-three) months commencing post Operational Go-Live. (oo) **"Utility"** means the entity, named, and as briefly described in **Bid Data Sheet**, that has issued the Request for Bids for Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on Design Build Finance Own Operate Transfer (DBFOOT basis), to enter into a Contract for Design Build Finance Own Operate Transfer (DBFOOT) AMI system in the Project area as per the RFP Document.

	(pp) **"Ultimate Parent Company"** shall mean an entity which owns at least twenty six percent (26%) equity in the SoleBidder or Member of a Consortium, (as the case may be) and in the Technically Evaluated Entity and/or Financially Evaluated Entity (as the case may be) and such SoleBidder or Member of a Consortium, (as the ease may be) and the Technically Evaluated Entity and/or Financially Evaluated Entity (as the case may be) shall be under the direct control or indirectly under the common control of such entity. (qq) **"Infrastructure sector"** shall mean such sectors notified by Department of Economic Affairs in its Gazette Notification no. 13/1/2017-INF dated 26th April 2021 and as amended from time to time. 1.1.1 Capitalised terms used herein but not defined specifically shall have the meaning as ascribed to them in Section 5 and Section 6, and elsewhere in RFP Document. 1.2 **Singular and Plural**: Where the context so requires, words imparting the singular only also include the plural and vice versa. 1.3 **Headings and Marginal Notes**: Headings and marginal notes to the terms and conditions of the Contract are not deemed to form part thereof nor are to be taken into consideration in the interpretation or construction thereof or of the Contract. 1.4 **E-Reverse Auction**: The bidders get an opportunity to change their prices by participating in the auction.
2. **Introduction** **(a) About this Request for Proposal**	2.1 This Request for Proposal (RFP) is issued by the Utility for selecting the AMISP to implement Utility's AMI Project. This RFP Document provides the overall structure of the document (as outlined in the beginning of the document in the section titled "Summary, Abbreviations & Table of Content"), requirements and general terms and conditions applicable to each Bidder. 2.1.1 The RFP Document (also referred to as the bidding document) consist of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any Addenda/ Corrigenda/ Amendments/ Clarifications etc. issued thereto from time to time in accordance with this Section 3. **PART I Bidding Procedures and Requirements** • Section 1 - Request for Proposal Notice • Section 2 - Eligibility Requirements • Section 3 - Instructions to Bidders and Bid Data Sheet • Section 4 - Bidding Forms - Technical Proposal

	• Section 5- Bidding Forms - Financial Proposal • Section 6 - Project Requirements **PART II Contract Form and Conditions of Contract** • Section 7–Contract Form and Conditions of Contract **PART III Contract Related Forms** • Section 8–Contract Related Forms
(b) Bidding Process and Electronic-Procurement System	2.2 Bidding against the Request for Proposal shall be under **Two Envelope Single Stage Bidding Process along with technical demonstration.** The bidding process will be conducted online with Electronic – Procurement System (e- Procurement/ e- Tendering/ e-Bidding System) as specified in **BDS**. 2.2.1 The Bidders who wish to participate in online Tenders will have to procure/ should have legally valid digital signature as per Information Technology Act, 2000 using which they can sign their electronic Bids. 2.2.2 All Bids should be digitally signed. For details regarding digital signature certificate and related training, the Bidder should contact at the address mentioned in **BDS**.
(c) Study of Utility's Existing Systems	2.3 The Bidders are invited to submit their Proposal comprising a Technical Proposal and a Financial Proposal, for award of Contract named in the **BDS**. The Proposal will be the basis for evaluation and holding discussions, if required, and ultimately signing the Contract with the Selected Bidder. 2.4 A standard brief regarding detail of existing systems relevant to the AMI Project has been provided in **BDS**. However, notwithstanding the same, all Bidders are advised to visit and examine the site and existing facilities, and obtain for itself, on its own responsibility and cost, all information that may be necessary for preparing the Bid. The cost of visiting the site shall be at the Bidder's own expense. 2.5 The Bidder and any of its personnel or agents shall be granted permission, through the assistance of the Utility, by the Utility to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Utility and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of/or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.
d) Pre-Bid Meeting	2.6 The Bidder's designated representative(s) is/are invited to attend a pre-bid meeting at Bidder's expense, which shall take place at the time and venue specified in the **BDS**

	2.7 The purpose of the meeting will be to clarify any issues regarding this RFP in general and the scope of work in particular. 2.8 The Bidder may submit any question or query to Utility in writing, to reach Utility not later than one week before the meeting as per the format given in **BDS**. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted as indicated hereafter. 2.9 Minutes of the meeting, including the text of the questions raised and the responses given, together with any responses prepared after the meeting, will be transmitted through the e-Procurement System mentioned in ITB 2.2without delay to all prospective Bidders who have downloaded the RFP. 2.10 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder
3. **Conflict of Interest**	3.1 A Bidder shall not have a conflict of interest that affects the Bidding process (the "**Conflict of Interest")**. In the event a Bidder is found to have a Conflict of Interest, the Utility may choose to reject the Bid, terminate the AMISP Contract (in the event it has been awarded) as per termination clause in the AMISP Contract. Any Bidder found to have a Conflict of Interest shall be disqualified. 3.2 A Bidder shall be deemed to have a Conflict of Interest affecting the bidding process, if: (a) the Bidder or its Member (or any constituent thereof) and any other Bidder or its Member (or any constituent thereof) have common controlling shareholders or other ownership interest; Provided that this disqualification shall not apply in cases where the direct or indirect shareholding of a Bidder or its Member (or any shareholder thereof having a shareholding of more than 15% (fifteen per cent) of the paid up and subscribed share capital of such Bidder or its Member, as the case may be) in the other Bidder or its Member, is less than 15% (fifteen per cent) of the subscribed and paid-up equity share capital thereof; Provided further that this disqualification shall not apply to any ownership by a bank, insurance company, pension fund or a public financial institution referred to in sub-section (72) of section 2 of the Companies Act, 2013. For the purposes of this Clause, indirect shareholding held through one or more intermediate persons shall be computed as follows: (i) where any intermediary is controlled by a person

		through management control or otherwise, the entire shareholding held by such controlled intermediary in any other person (the "Subject Person") shall be taken into account for computing the shareholding of such controlling person in the Subject Person; and (ii) subject always to sub-clause (a) above, where a person does not exercise control over an intermediary, which has shareholding in the Subject Person, the computation of indirect shareholding of such person in the Subject Person shall be undertaken on a proportionate basis; provided, however, that no such shareholding shall be reckoned under sub-clause (ii) if the shareholding of such person in the intermediary is less than 26% of the subscribed and paid up equity shareholding of such intermediary; or (b) a constituent of such Bidder is also a constituent of another Bidder; or (c) such Bidder or its Member thereof receives or has received any direct or indirect subsidy, grant, concessional loan or subordinated debt from any other Bidder or its Member, has provided any such subsidy, grant, concessional loan or subordinated debt to any other Bidder or its Member; or (d) such Bidder has the same legal representative for purposes of this Bid as any other Bidder; or (e) such Bidder, has a relationship with another Bidder, directly or through common third party/ parties, that puts either or both of them in a position to have access to each other's information about, or to influence the Bid of either or each other; or (f) Such Bidder has participated as a consultant to the Authority in the preparation of any documents, design, or technical specifications of the Project. *Explanation: In case a Bidder is a Consortium, then the term Bidder as used in this Clause shall include each Member of such Consortium.*
4. **Bidders to Inform Itself Fully**	4.1	The Bidder shall make independent enquiry and satisfy itself with respect to all the required information, inputs, conditions (including site conditions) and circumstances and factors that may have any effect on its Bid. Once the Bidder has submitted the Bid, the Bidder shall be deemed to have examined the laws and regulations in force, and fixed its price taking into account all such relevant conditions and also the risks, contingencies and other circumstances which may influence or affect the Services performed within the scope of work, as provided in this RFP. Accordingly, the Bidder acknowledges that, on being selected, it shall not be relieved from any of its obligations under the RFP Documents nor shall be entitled to any extension of time for

	commencement of Services or financial compensation for any reasons whatsoever attributable to AMISP. 4.2 The Bidders should particularly acquaint themselves with the technical requirements of Utility's systems, operations, assets, equipment, statutory codes, and standards. 4.3 The Bidder shall familiarize itself with the procedures and time frames required to obtain all consents, clearances and permits required for implementation of the Project
5. **Fraud and Corruption**	5.1 Utility requires compliance with the Anti-Corruption Guidelines/ Laws in force of the relevant Government/ its instrumentalities/ Utility.
6. **Eligibility and Qualification Requirements**	6.1 The eligibility and qualification requirements for submission of Proposals against the RFP are given in Section 2. Proposals, if any, from Bidders not complying with the same shall be out-rightly rejected and shall not be considered for evaluation.
B. Preparation of Proposals	
7. **General Considerations and Instructions**	7.1 In preparing the Proposal, the Bidder is expected to examine the RFP Document in detail. Material deficiencies in providing the information or documentation requested in the RFP Document may result in rejection of the Proposal. 7.2 All Bidders shall comply with the dates and amounts indicated in Section 1of this RFP. 7.3 The Bidders shall comply with and agree to all the provisions of this RFP for various bidding considerations including but not limited to eligibility, costs, payments, information regarding Utility's systems, bid formats, Bid submission and other considerations. 7.4 The Bidders shall be evaluated based on the requirements, criteria, norms, and procedures laid out or included by reference, in this **Section 3** of the RFP Document. 7.5 The Bidders shall be required to undertake the scope of work for the Project indicated in **Section 6** of the RFP Document. 7.6 The Bidders must conform to the requirements and provide a list of equipment (including any special equipment) necessary to meet the technical specifications, functional & performance requirements as specified in the Section 6of RFP Document as per the format provided in Form 14 in Section 4. The equipment supplied shall confirm to all the requirements under all applicable laws including any order issued by the central government including Order No No.9/16/2016-Trans-Part (2) dated 18 November 2020, Order No. F/No.6/18/2019-PPD by Ministry of

	Finance, Department of Expenditure, Public Procurement Division dated 23 July 2020, latest Government of India Guidelines for Make in India, Domestically manufactured products, Atmanirbhar Bharat and circulars DIPP Office Memorandum No. P-45021/2/2017-PP (BE-II) date: 16th Sept. 2020, MeitY Circular No.1(10)/2017-CLES dated 06.12.2019 and Order No. 11/05/2018-Coord. by the Ministry of Power dated 17 September 2020 including any amendments or modifications to the same from time to time. 7.7 Bidder shall submit 'Clause by Clause' compliance to the RFP document including the AMISP Contract and the technical specifications and functional requirements (with amendments, if any) as per the format prescribed in **Form 15**given in Section 4. 7.8 Bidder's Proposal shall include sufficient information and supporting documentation in order to determine compliance without further necessity for inquiries. 7.9 The Bidder's Proposal shall clearly identify all features described in the specifications along with any supporting reference material in accordance with ITB 15.13 as per the format prescribed in **Form 3**given in Section 4. 7.10 An analysis of the technical specifications, functional and performance requirements of the AMI system as provided in Section 6 may lead the Bidders to conclude that additional items (for example communication repeater, router etc.) are required that are not specifically mentioned in this specification. The Bidders shall be responsible for installing such items (at no additional cost to the Utility) such that a reliable and fully functional AMI system is implemented that meets or exceed the capacity and performance requirements. Such materials shall be deemed to be within the scope of the AMISP Contract. To the extent possible, the Bidder shall identify and include all such additional items in their proposal. 7.11 The Bidders are advised to visit sites (at their own expense), prior to the submission of the proposal, and make surveys and assessments as deemed necessary for proposal submission. 7.12 Failure by Utility to require information from a Bidder that has not been properly provided shall not be construed as waiver on the part of Utility of the obligation of the Bidder to furnish the said data / information unless the waiver is in writing. 7.13 Bid submitted by the Bidders before the Bid Submission Deadline, shall become the property of the Utility and shall not be returned to the Bidders. 7.14 The cost of all stamp duties payable for executing the RFP, Bid Documents or Project shall be borne by the Bidders.

	7.15	No interest shall be paid to the Bidder on any amount submitted to Utility, whether to be returned or not.
8. **Cost of Bidding / Preparation of Proposal**	8.1	The Bidder shall bear all costs associated with the preparation and submission of its Proposal, including post-bid discussions, technical and other presentations etc., and Utility shall not be responsible or liable for those costs, regardless of the conduct or outcome of the selection process. Utility is not bound to accept any proposal and reserves the right to annul the selection process at any time prior to Contract award, without thereby incurring any liability to the Bidder.
9. **Language**	9.1	Bid/Proposal prepared by the Bidders and all correspondence and documents relating to the Bid exchanged by the Bidder and Utility and its associates shall be written in the English language.
10. **Documents Comprising the Proposal and List of Forms**	10.1	The Proposal shall comprise the documents and forms mentioned in this Section in general and listed in **Section 4** and **Section 5** in particular. A Document Checklist for the same as well as the list of forms referred to in this RFP Document is provided in **BDS**.
11. **Only One Proposal**	11.1	A Bidder shall submit only one Bid in the same bidding process, either individually as a Sole Bidder or as a Lead Member of a Bidding Consortium. Any member of the bidding consortium, including its Parent(s) and/or Affiliate(s), whose technical and financial capabilities are showcased for meeting the criteria as mentioned in Clause 8.1 of Section 2, shall not separately participate directly or indirectly in another bid in the same bidding process for meeting the criteria as mentioned in Clause 8.1 of section 2.
12. **Proposal / Bid Validity& Bid Security**	12.1	The Bid/ Proposal submitted by the Bidder(s) shall be valid for a period of specified in **BDS** reckoned from the Bid Submission Deadline specified in ITB 17 as may be extended from time to time.
	12.1.1	All such offers, and terms and conditions set forth in this RFP shall be valid for the AMISP till the successful completion of the Project.
	12.1.2	In exceptional circumstance, Utility may solicit the Bidder's consent to an extension of the Bid validity period. The request and responses thereto shall be made in writing or by email. If a Bidder accepts to extend the validity, the Bid Security shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request will not be required or permitted to modify its Bid.
	12.2	The Bidder shall furnish as part of its Technical Bid, a Bid security in original form, and in the amount specified in the **BDS**.

	~~12.3 Pursuant to **ITB 12.2**, the Bid Security shall be a demand guarantee, and in any of the following forms, at the Bidder's option:~~ ~~(a)an unconditional bank guarantee issued by any of the banks mentioned in **BDS**;~~ ~~(b) Bid Security in other forms, if specified in the **BDS.**~~ ~~In the case of a bank guarantee, the Bank Guarantee for Bid Security shall be provided by the Lead Consortium Member/ Sole Bidder in the format prescribed in Form 6 included in Section 4, Bidding Forms - Technical Proposal. The bid security shall be valid for a period of minimum 300 days (i.e. 180 days bid validity + 120 days) from the initial date of opening of tender as mentioned in the published NIT. If the date of opening is extended, the bidders who already submitted bid are having Bid Security – BG Validity based on initial date of opening rather than extended date of opening. Hence the bid security validity shall be kept based on initial date of opening for avoiding complications at the time of bid opening.~~ 12.4 Any Bid not accompanied by a substantially responsive Bid Security a specified, shall be rejected by the Utility as non-responsive. 12.5 If the Bid Security from any Bidder is forfeited or lapsed either partly or wholly during the Bid process, then such Bidders and Consortium are liable for rejection. 12.6 Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful bidder's signing the contract and furnishing the Performance Security pursuant to **ITB 29**. 12.7 The Bid Security of the Selected Bidder shall be returned as promptly as possible once the AMISP has signed the Contract with the Utility and furnished the required Performance Security. 12.8 The Bid Security may be forfeited if 12.8.1 The Bidder withdraws/ modifies/ substitutes its Bid during the period of Bid validity as specified in ITB 12.1 or any extension thereto provided by the Bidder; 12.8.2 Bid is rejected for existence of conflict of interest, or more than one bid being submitted by a Bidder 12.8.3 Bid submitted by a Consortium is not accompanied by Consortium Agreement in the form provided in this RFP. 12.8.4 The Selected Bidder: 12.8.4.1 Fails to sign the AMISP Contract; or 12.8.4.2 Fails to furnish a Performance Security in accordance with ITB29; or is found to have submitted false particulars/fake documents; or

	12.8.4.3 refuses to execute the work at its agreed scope/quoted rates, after Utility issues the Letter of Award 12.8.4.4 Is involved in incidents of manipulation of rates either by cartelization or otherwise.
a. Extension of Proposal Validity	12.9 Utility will make its best effort to complete the bidding process and award the contract prior to the date of expiry of the Bid/ Proposal validity. However, should the need arise, Utility may request, in writing, all Bidders who submitted Bids/Proposals prior to the Bid Submission Deadline to extend the Proposals' validity. 12.10 If the Bidder agrees to extend the validity of its Proposal, it shall be done without any change in the original Proposal. 12.11 The Bidder has the right to refuse to extend the validity of its Proposal in which case such Proposal will not be further evaluated.
13. **Clarification and Amendment of RFP**	13.1 Bidders may seek clarifications on this RFP in writing, through a letter, fax or email to reach Utility no later than the period specified in **BDS**. 13.2 Utility may issue clarification only, at its sole discretion, which is considered reasonable by it. 13.3 Any such clarifications/ amendments issued shall be hosted on the website of the Utility and transmitted through the e-Procurement System mentioned in ITB 2.1. 13.4 Utility is not under any obligation to entertain/ respond to suggestions made or to incorporate modifications sought for. 13.5 For the avoidance of any doubt, it is hereby clarified that the Utility is not obliged to extend the Bid Submission Deadline on account of clarifications sought in accordance to ITB 13.4. 13.6 During the bidding process, Utility, for any reason may modify the RFP, including the timelines, by issuance of addendum / modification / errata and / or a revised document. 13.7 Revisions or amendments in the bidding guidelines may cause Utility to modify amend or supplement the RFP to be in conformance with any applicable Law. Such document shall be notified in writing through the e-Procurement System mentioned in ITB 2.1, or letter or fax or e-mail to all the entities who have downloaded the RFP, and the same shall be binding on them. 13.8 Utility shall not be responsible for any delay in receipt of the addendum/ modification/ errata and/ or revised document and receipt of the same by the Bidders shall be presumed by Utility upon taking all reasonable steps to notify the Bidders. Late

		receipt of any addendum/ modification/ errata and/ or revised document will not relieve the Bidder from being bound by that modification or the Bid Submission Deadline. All such amendments/modifications shall be issued at least 7(seven) working days prior to the Bid Submission Deadline.
	13.9	In order to provide reasonable time to the Bidders to take the modification into account in preparing their Bid, or for any other reasons, Utility may, at its discretion, extend the deadline/ timeline for Bid submission.
14. **Preparation of Bid/ Proposal and Bid Formats**	14.1	The Bidder shall prepare its Bid and furnish required information and documents as per the guidelines, formats, forms, schedules, fees, and other specification in this Section, as well as the RFP Document in general.
	14.2	Strict adherence to the formats/ forms, wherever specified, is required. Wherever information has been sought in specified formats, the Bidder shall refrain from referring to brochures or pamphlets. Non-adherence to formats and/ or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format must be duly signed and stamped by the authorized signatory of the Bidder.
15. **Technical Bid/ Proposal Format and Content**	15.1	The Technical Bid/Proposal shall be prepared using the Forms provided in Section 4 of the RFP and shall comprise the information, details and documents listed in subsequent clauses herein The Technical Bid/ Proposal shall not include any financial information. A Technical Proposal containing material financial information shall be declared non-responsive.
	15.2	The Technical Bid shall contain the list of all participating Consortium Members and Sub-contractor(s) (if applicable) participating in the Bid as per the format prescribed in Form 1 given in Section 4. Furthermore, the Technical Bid shall contain a covering letter by the Lead Consortium Member/ Sole Bidder duly designated and signed by all Members of that Bidding Consortium as per the format prescribed in Form 8 given in Section 4.
	15.3	The Technical Bid shall contain a legally enforceable Consortium Agreement (in case Bidder is a Consortium) entered amongst all Members of that Bidding Consortium, designating one of the Members to be the Lead Consortium Member as per the format prescribed in Form8 given in Section 4. In the absence of a duly executed Consortium Agreement, the Bid shall not be considered for evaluation and will be rejected.
	15.4	The Technical Bid shall contain Power of Attorney from each Consortium Member in favour of the Lead Consortium Member as per the format prescribed in Form9 given in Section 4. All submissions and representations by the Lead Member shall be deemed to be on-behalf of the entire consortium and shall be binding all the members of the Consortium.

	15.5 In case a Sole Bidder or any Consortium Member is a foreign entity, then it may submit a Board resolution/ Power of Attorney/ authorization, which should satisfactorily and unambiguously encompass all the terms and conditions of the Power of Attorney prescribed in Form 9 given in Section 4. In the event of Award of Contract, such foreign entity (ies) shall be required to have a registered office (under the Companies Act 1956/ 2013 with Registrar of Companies) in India. 15.5.1 Provided further that such Board resolutions/Power of Attorney/authorization, as specified above, in case of a foreign entity, shall be supported by an unqualified opinion issued by the legal counsel of such foreign entity, stating that the Board resolutions are in compliance with the applicable laws of the respective jurisdictions of the issuing company and the authorizations granted therein are true and valid. In the case of a foreign entity, in the event, any and/or all of the documents/resolutions are in any other language other than English, then a duly notarized copy of such translation shall also be required to be submitted. 15.6 The Lead Consortium Member/ Sole Bidder shall designate one person to represent the Bidding Consortium/ Bidder in its dealings with Utility. The person designated by the Lead Consortium Member/ Sole Bidder (registered Company) shall be authorized through a Power of Attorney as per Form 10 given in Section 4 to perform all tasks including, but not limited to, providing information, responding to inquiries, signing of Bid on behalf of the Consortium, etc. and attach the same in the Technical Bid. 15.7 The Technical Bid shall contain signed Letter of Consent as per Form 11 given in Section 4 from each Consortium Member that the Bid has been reviewed and each element of the Bid is agreed to by them including but not limited to any commitment in the Project. 15.8 The Technical Bid shall contain the Tender Fees and the Bid Security as per the format prescribed in Form 6 given in Section 4. 15.9 The Technical Bid shall contain all documents required to prove/substantiate the Eligibility and Qualification Requirements of the Bidders or the Bidding Consortium specified in ITB 6.1 and Section 2 (as per the format prescribed in Form 2 given in Section 4): a) Company profile document with evidence of fields of competence for each Consortium Member b) Attested copy of Certificate of Registration/Incorporation issued by the Registrar of Companies for each Consortium Member/ Bidder c) Certificate of Commencement of Business issued by the Registrar of Companies for Lead Consortium Member/

	Sole Bidder clearly indicating the number of years of operation. 15.10 The Bidder shall submit a preliminary Project implementation plan along with the Bid which shall include at least the following activities (as per the format prescribed in Form 3 given in Section 4). 15.11 In case of Award of the AMISP Contract, the detailed Project implementation plan, submitted as part of the Technical Bid, shall be revised and submitted by the AMISP, in consultation with the Utility, to ensure smooth takeover of existing Utility systems and any ongoing Services under the scope of the AMI Project. 15.12 The Technical Bid of the Bidder shall contain the indicative List of Material and Services in the format prescribed in Form 14 as given in Section 4 without any mention of costs/ prices. 15.13The List of Material and Services shall be accompanied by the detailed specifications of the supply in the Technical Bid demonstrating responsiveness of the quoted Solution. The Bidder shall also indicate the country of origin of each equipment in Form 14as given in Section 4. For supply of equipment / material from the country of origin other than India, the bidder shall submit performance certificate in support of satisfactory operation in India or a country other than the country of origin having climatic and operational conditions including ambient temperature similar to that of India for more than number of years, indicated in **BDS** in accordance with Order No. 11/05/2018-Coord. Dated 17 September 2020 issued by the Ministry of Power including any amendments or modifications to the same from time to time. 15.14 The Technical Bid of the Bidder shall contain the names and details of the suitably qualified Bidder's representative and Key Personnel to perform the AMISP Contract as per the format provided in Form 4 given in Section 4. The data on their experience should be supplied using the Form 5 given in Section 4 for each candidate proposed. 15.15 Any removal/ change/ replacement of Key Personnel (as provided in Form 4 and 5 given in Section 4) shall be notified to Utility within 7(seven) working days along with the Curriculum Vitae (CV) of the personnel replacing the previous personnel. The

	personnel replacing the previous key personnel shall have equivalent or better educational qualification and relevant professional experience 15.16 Undertaking from the Technically OR Financially Evaluated Entity (ies) OR Undertaking from the Ultimate Parent Company for total equity investment commitment, in the prescribed format in Form 18, to meet any shortfall in the equity investment by the Selected Bidder in the SPV. Note: The effective Equity holding Of the Selected Bidder in the SPV, as specified in Clause 4.2 shall be computed as per the provisions Of Clause 4.2.6 of this RFP. Provided further, in case the SoleBidder or Member of a Consortium, (as the case may be) holds at least twenty six percent (26%) equity in such Technically; Financially Evaluated Entities, whose credentials have been considered for the purpose of meeting the Qualification Requirements as per the RFP, no such Undertaking shall be required from the Technically / Financially Evaluated Entities. If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from compliance to Clause 15.16 of Section 3. 15.17 Board resolutions as per prescribed formats enclosed as Form-19. duly certified by the Company Secretary or any Whole-time Director / Manager (supported by a specific Board Resolution), as applicable to the Bidder and mentioned hereunder, (a) Board resolution from the SoleBidder (and any investing Affiliate / Parent Company / Ultimate Parent Company) committing one hundred percent (100%) in aggregate of the equity requirement for the Project - Format-1 of Form 19. (b) Board resolutions from each of the Consortium Member of the Bidding Consortium (and any investing Affiliate / Parent Company / Ultimate Parent Company) together committing to one hundred percent (100%) in aggregate of equity requirement for the Project, in case Bidder is a Bidding Consortium - Format-l of Form 19; (c) In either of the cases as in (a) or (b) above as applicable, Board resolutions as per Format 2 of Form 19 for total equity investment commitment from the Technically / Financially Evaluated Entity (ies) whose technical / financial credentials had been considered for the purpose of meeting Qualification

	Requirements as per the RFP OR Board resolutions as per Format 2 of Form 19 from the Parent Company or the Ultimate Parent Company for total equity investment commitment. Provided that such Board resolutions, as specified in (a) or (b) or (c) above. In case of a foreign entity, shall be supported by an unqualified opinion issued by an independent legal counsel practicing in the relevant country, stating that the Board resolutions are in compliance with the applicable laws of the respective jurisdictions of the issuing company and the authorizations granted therein are true and valid. For clarity sake, illustrations identifying which Board Resolution shall be applicable in typical cases are provided in Annexure to Form 19. If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from compliance to Clause 15.17 of Section 3. Note: Submission of the Technical Proposal in a materially wrong format may lead to the Proposal being deemed non-responsive to the RFP requirements.
16. **Financial Bid/ Proposal Format and Content**	16.1 The Financial Proposal shall be prepared using the Forms provided in Section 5 of the RFP and shall comprise the information, details and documents listed in subsequent clauses herein. 16.2 The Financial Bid shall only be submitted electronically as per the format prescribed in Form 1 given in Section 5. No hard copy of the Financial Bid shall be submitted. 16.3 The Financial Bid shall include only the cost of different meter types that are required for installation, operation and maintenance of the Project. Price quoted should clearly mention the basic cost/ unit price including any other taxes/ duties/ levies and any other taxes/ duties/ levies, Goods and Service Tax (GST). The Financial Bid will be evaluated basis the total cost of the Project as quoted by the Bidder(s) for the Contract Period in Form 1 given in Section 5. 16.4 The Bidder shall quote the AMISP Service Charge for each meter type for the Contract Period on INR per meter per month basis in line with the payment schedule as provided in the AMISP Contract. The Financial Bid shall be quoted in both 'numbers' and 'words'. In case of any discrepancy between the quoted Financial Bid in 'numbers' and 'words', the quoted Financial Bid in 'words' will prevail over the quoted Financial Bid in 'numbers'.The value of lump sum payment for each

		meter type is indicated in **BDS**. While providing the financial quote, the Bidder must consider the lump-sum payment to AMISP. The AMISP shall accordingly quote the AMISP Service Charge for Contract Period.
	16.5	Unit prices (exclusive of all taxes/ duties/ levies/ cess etc.) (As provided in Form 1 given in Section 5) quoted by the Bidder shall be firm and final and shall remain constant throughout the Contract Period and shall not be subject to any modifications.
	16.6	Any items or prices omitted by the Bidder, if incurred at a later stage by the Bidder, within the scope of work as provided in the AMISP Contract, shall be borne by the Bidder with no financial liability on Utility.
	16.7	Any scope of work required for expansions during the Contract Period shall be supplied by the AMISP keeping the specifications and unit price same as per the List of Material and Services (as provided in Form 14 given in Section 4) and Financial Bid (as provided in Form 1 given in Section 5), respectively.
	16.8	All prices in the Financial Bid shall be quoted in Indian Rupees. The Bidder shall bear the risk related to foreign exchange variations during the Contract Period. The variation in the statutory taxes will be in accordance with the AMISP Contract.
	16.9	Alternative Bids with any financial implications shall be rejected.
C. Submission, Opening and Evaluation		
17. **Submission of Bids/ Proposals and Bid Submission Deadline** **(a) Submission of Bids/ Proposals**	17.1	Both Technical Bid and Financial Bid shall be digitally signed and submitted electronically using the e-Procurement system indicated in ITB 2.2 on or before the Bid Submission Deadline following the instructions therein. All the documents shall be scanned and uploaded
	17.2	Requisite Tender Fee and Bid Security in the specified form/ instrument shall be electronically submitted in original so as reach before the Bid Submission Deadline, failing which the Bid shall be deemed non-responsive.
	17.3	All documents including Tender Fee and Bid Security shall be electronically submitted before the Bid Submission Deadline.
	17.4	No hard copies in any form shall be submitted by the Bidder.
	17.5	For all electronic submissions, please refer the procedure for

		submission via e-tender in the RfP.
	17.6	The Bid shall clearly mention the name of the Lead Consortium Member/ Sole Bidder submitting the Bid.
	17.7	The Bid shall not contain the Financial Bid. The Financial Bid shall only be submitted electronically.
	17.8	The electronically submitted documents and the information contained therein shall prevail and be treated as the final submission.
	17.9	Insufficiency of the electronically submitted Bid shall not be compensated by any information, documentation or material.
	17.10	All Bids shall be electronically submitted, as may be specified in this Section, by Utility no later than the Bid Submission Deadline indicated in **BDS** as may be extended from time to time by the Utility.
	17.11	Bidders may prepare, edit, substitute or withdraw their offers any number of times online before the Bid Submission Deadline as may be permitted by the e-Procurement system. After the Bid Submission Deadline, the Bidder shall not, or attempt to, change or withdraw the Bid under any circumstances. No written or online request in this regard shall be entertained.
(b) Bid Submission Deadline	17.12	Any Bid received by Utility electronically, after the Bid Submission Deadline prescribed by Utility will not be uploaded and accordingly be rejected.
	17.13	Utility may, at its discretion, extend this Bid Submission Deadline by amending the RFP at any time prior to opening of the Bids, in which case all rights and obligations of Utility and the Bidders shall thereafter be subject to the deadline as extended.
	17.14	Any Proposal or its modification received by Utility after the deadline shall be declared late and rejected.
	17.15	The Bidder shall not have to submit any meter sample during submission of the bid and all the procedures related to meter samples will be applicable as mentioned in the RFP related to technical demonstration during evaluation of bids and supply of meters during execution of the contract.

18. **Confidentiality**	18.1	Information relating to the examination, evaluation, comparison, and recommendation of AMISP Contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process.
	18.2	Any attempt by a Bidder to influence Utility in the examination, evaluation, comparison, and post qualification of the Bids or AMISP Contract award decisions may result in the rejection of its Bid.
	18.3	If any Bidder, from the time of opening the Technical Bids to the time of AMISP Contract award, wishes to contact Utility on any matter related to the bidding process, it should do so in writing.
19. **Opening of Technical Bids/ Proposals**	19.1	The Technical Bids shall be opened at the date and time, and the address indicated **BDS**.
	19.2	The Bids shall be deemed to be under consideration immediately after they are opened and confirmation or receipt of the Tender Fee and Bid Security, and until an official intimation of award or rejection is made by Utility to the Bidders.
	19.3	Utility shall then separately evaluate the Bids with respect to the Eligibility and Qualification Requirements, sufficiency of the submission, conformation/ compliance/ responsiveness to all the mandatory requirements, terms, conditions, and specifications of the RFP Document without any deviation, reservation, or omission, and other parameters outlined in this RFP.
	19.4	The Financial Proposal shall remain unopened in the e-Procurement/ e-Tendering system securely, until they are opened in accordance with ITB 22.
	19.5	At the opening of the Technical Proposals the following shall be read out: (i) the name of the Bidder; (ii) any modifications to the Proposal submitted through the e-Procurement/ e-Tendering system prior to proposal submission deadline; and (iii) any other information deemed appropriate.
20. **Bid/ Proposals Evaluation Overview and Verification/ Clarifications**	20.1	The bidding process is designed to select the AMISP through a series of assessment of: (i) conformation/ compliance to all the mandatory requirements under applicable laws and this tender, terms, conditions, and specifications of the RFP Document without any material deviation, reservation, or omission; and (ii) the financial amounts quoted by the Bidder. The Bid submitted by the Bidder shall consist of a Technical Bid and a Financial Bid.

		First Stage-Fulfillment of Eligibility and Qualification requirements and determination of substantial responsiveness to the RFP Documents: The Technical Bids shall be opened by Utility and be checked to determine: (i) whether the Bidders comply with the Eligibility Requirements, have offered eligible AMI Services in their Bids, as specified in ITB 6.1 and Section 2 (ii) whether the Bidders meet the Qualification Requirement specified in ITB 6.2 and Section 2 (iii) whether the Bids are substantially responsive to the RFP document including the requirements specified in Section 6 basis 'Clause by Clause' compliance to the RFP Document including the technical specifications and functional requirements (with amendments, if any) as per the format prescribed in Form 15given in Section 4. (iv) Technical demonstration of Bidders meeting the Qualification Requirements. **Second Stage-Opening of Financial Bid:** Financial Bids of all technically qualified Bidders would be opened, basis which the award of AMISP Contract shall be determined. **Third Stage-Award of Project:** The "Successful Bidder" as defined in ITB 25 shall be awarded the AMISP Contract.
	20.2	The Bidder is not permitted to alter or modify its Bid/ Proposal in any way after the Bid Submission Deadline.
	20.3	Utility's determination of the responsiveness of a Bid/ Proposal is to be based on the contents of the Proposal itself including any response to clarifications sought by Utility which does not alter the substance of the Proposal or the price.
	20.4	A substantially responsive Bid/ Proposal is one that conforms to all the mandatory requirements, terms, conditions, and specifications of the RFP Document without any material deviation, reservation, or omission, as defined in ITB 24.
	20.5	The Contract, if awarded, shall be executed in accordance with RFP document and any other conditions.
	20.6	Notwithstanding anything stated in the RFP Document, Utility reserves the right to verify the authenticity of the documents submitted for meeting the eligibility, qualification and/or other specified requirements and may request for clarifications any additional information/ documents from the Bidder. However,

		the Bidder shall not be permitted to alter the substance of the Proposal or the price under any circumstances whatsoever
	20.7	Utility reserves the right at its sole discretion to contact the Bidder's bank, lenders, financing institutions and any other persons as necessary to verify the Bidder's information/documents for the purpose of eligibility, qualification and/ or other specified requirements.
	20.8	Utility may verify the Bidder's technical and financial data by checking with the Bidder's clients/ lenders/ bankers/ financing institutions/ any other person as necessary.
	20.9	To assist in the examination, evaluation, comparison and post-qualification of the Bids, Utility may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by Utility shall not be considered. Utility's request for clarification and the response shall be in writing. No change in the prices shall be sought, offered, or permitted by Utility in the evaluation of the Financial Bids.
21. **Evaluation of Technical Bids/ Proposals**	21.1	All Bids will first be evaluated for 'Clause by Clause' compliance to the RFP document and the AMISP Contract including the technical specifications and functional requirements (with amendments, if any) as per the format prescribed in Form 15given in Section 4. The Bidders fulfilling the Eligibility and Qualification Requirement and having submitted substantially responsive Bids conforming to and meeting all the mandatory requirements, terms, conditions, and specifications of the RFP Document without any material deviation, reservation, or omission, as defined in ITB 24, shall qualify for the opening of Financial Bid.
	21.2	In the event the Technical Bid is substantially responsive, Utility may waive any deviation, reservation, or omissionin the Bid as defined in ITB 24.1
	21.2.1	Provided that a Technical Bid is substantially responsive, Utility may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial, nonconformities or omissions in the Technical Bid related to documentation requirements. Such omission shall not be related to any aspect of the price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
	21.2.2	The next step will be Technical demonstration of the Bidders who have met the Qualification requirements. After successful demonstration by the Bidders, the Bidders will be selected which is also part of the Technical evaluation.

22. **Opening of Financial Proposals**	22.1 At the completion of the technical evaluation, Utility shall intimate the technically qualified Bidders for opening of Financial Bids, along with the date, time and venue of opening of Financial Bids. 22.2 The Financial Bids shall be opened through the e-Procurement system referred to in ITB 2.2, in the presence of authorized representatives of all technically qualified Bidders who chose to be present at the specified venue on the specified date and time.
23. **Evaluation of Financial Bids/ Proposals**	23.1 Provided that the Technical Bid is substantially responsive, Utility will correct arithmetical errors during evaluation of Financial Proposals on the following basis: i. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of Utility there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected; ii. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail, and the total shall be corrected; iii. if there is a discrepancy between words and figures, the amount in words shall prevail. However, where the amount expressed in words is related to an arithmetic error, the amount in figures shall prevail subject to (i) and (ii) above. Except as provided in (i) to (iii) herein above, Utility shall reject the Financial Bid if the same contains any other computational or arithmetic discrepancy or error.
24. **Deviations, Reservations and Omissions**	24.1 During the evaluation of Bids/ Proposals, the following definitions apply: (a) "Deviation" is a departure from the requirements specified in the RFP document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the RFP document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the RFP document. 24.2 A substantially responsive Bid is one that meets the requirements of the bidding document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that: (a) if accepted, would: (i) affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in the Contract; or

	(ii) limit in any substantial way, inconsistent with the bidding document, the Utility's rights or the Bidder's obligations under the Contract; or (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.
25. **Successful / Selected Bidder**	~~25.1The price as per the Financial Proposal/ Bid of all technically qualified Bidders, determined upon evaluation of Financial Proposals/ Bids, shall be the basis for determination of the Successful Bidder/ Selected Bidder.~~ **25.1 E-reverse auction** • After opening of Price Bid, the Purchaser will conduct a Reverse Auction (RA) among the technically and commercially qualified bidders, through mp tenders portal for determination of the lowest bidder (L1). • The bidders shall confirm their acceptance to participate in the Reverse Auction at the time of submission of their bids. Bidders who do not accept Reverse Auction shall not be considered for further evaluation. **25.1.1 Process of Reverse Auction** a) Only the bidders who qualify in the technical and commercial evaluation and whose price bids are opened shall be eligible to participate in the Reverse Auction. b) The Reverse Auction will be conducted on a specified date and time, which will be communicated to the eligible bidders electronically through system generated email and SMS by mptenders portal. c) The date and time of commencement of e-Reverse Auction and duration of e Reverse Auction time shall be communicated at least 4 working days prior to such auction date. Any force majeure or other condition necessitation postponement of auction shall entitle MPPKVVCL, Indore) to postponement of auction even after communication, but, MPPKVVCL, Indore shall be obliged to communicate to all participating vendors the postponement prior to commencement of such e-Reverse Auction. In such cases also, at the notice of at least 4 working days shall be given. d) Each bidder is provided unique log in ID/password. e) Name of bidders/ vendors are anonymously masked. f) All qualified bidders can quote and lower their price offers. g) The lowest bidder can be displaced by an even lower bid, within the given time frame. h) Bid can be only at multiples of specified decrement value.

i) All bidders are able to view the current lowest price during the auction time.

j) On completion, a report is generated with all details of bid and the original names of the bidders.

25.1.2 Start Price & Decrement

a) The Purchaser shall start the Reverse Auction based on the lowest price discovered through the initial price bids.

b) The minimum decrement value will INR 5 Cr. Bidders shall be able to reduce their price only by a minimum decrement or its multiples.

c) The initial auction period will be 30 minutes (thirty minutes) with a provision of auto extension by five minutes from the scheduled / extended closing time if any fresh bid is received in last five minutes of auction period or extended auction period. Such auto extensions shall be effective only if, reduction in rate by a Bidder.

25.1.3 Determination of L1

At the end of the e-Reverse Auction, the bidder quoted the lowest total price shall be considered as L1, subject to verification of arithmetical errors and compliance with tender terms.

25.1.4 Other Conditions

a) Bidders are advised to ensure that they are fully trained and aware of the manner in which the E-bidding Portal operates and also clarify all their doubts regarding issues such as refreshing of screen, auction rules etc.

b) Discom will not entertain or accept any request for extension of time during the Reverse Auction Process. Bidders are, therefore, requested to make all the necessary arrangements/ alternatives as may be required to ensure their successful participation in the Reverse Auction Process. Failure of power or loss of internet connectivity at the premises of Bidders during the Reverse Auction Process cannot be the cause for failure to participate in the Reverse Auction Process. Discom shall not be responsible or liable for such eventualities.

c) The Purchaser/Employer reserves the right to accept or reject the Reverse Auction result, or to annul the Reverse Auction process, without assigning any reason thereof.

d) In case of failure of the Reverse Auction due to no participation or technical failure, the Purchaser/Employer may decide to proceed with the original price bids submitted or may re-conduct the Reverse Auction.

e) The price quoted in the Reverse Auction shall be inclusive of all applicable taxes, duties, levies, freight, insurance, etc., unless otherwise specified in the Tender.

	25.2 The technically qualified Bidder with the lowest Financial Bid after e-Reverse auction shall be considered as the Successful Bidder/ Selected Bidder and shall be considered for award of the AMISP Contract. The successful bidders is required to submit revised price scheduled based on the results of revers auction, on that basis LoA will be issued. 25.3 If the Successful Bidder/ Selected Bidder does not accept the correction of errors as per ITB 23.1, its Bid shall be disqualified, and its Bid Security shall be forfeited.
D. Award of Contract	
26. **Award Criteria**	26.1 Subject to ITB 25.3, the Utility shall award the Contract to the Successful Bidder/ Selected Bidder. 26.2 Utility shall present the Letter of Award (as per the format prescribed in Form 2 given in Section 8) to the Successful Bidder and invite the Performance Security in order to sign the AMISP Contract to implement the Project. 26.3 Restriction of Bidder (Lead or Consortium/JV Partner) in a particular Lot Post financial opening of Bids (reverse auction), any Bidder (Lead or consortium/ JV partner) who has been selected in a particular Lot of a Discom will be deemed as disqualified for opening of financial bid in the next Lot of that particular Discom whether the Bidder has participated as a Lead or consortium/JV partner in the next Lot of that Discom. i.e.: Bidder including consortium/JV partners selected in in Lot: TS NO- MD/WZ/06/1942 will be deemed as disqualified for opening of financial bid for the Lot: TS NO- TS NO- MD/WZ/06/1941 whether the Bidder has participated as a Lead or consortium/JV partner and vice a versa 26.4 The Successful Bidder shall provide an undertaking that the key staff identified for the Project (as submitted in its Technical Bid) shall be available for the respective proposed work requirement, anytime during the duration of the Project, till its successful completion 26.5 If for any reason the Bid of the Successful Bidder is rejected or Letter of Award issued to the Successful Bidder is cancelled, Utility is empowered to take decisions for any of the following: a) Consider the next lowest evaluated Bid from eligible and qualified Bidder whose bid is determined substantially responsive; or

		b) Annul the Bid process; or c) Take any such measure as may be deemed fit in the sole discretion of Utility, as applicable.
27. **Utility's Right to Vary Quantities at the time of Award**	27.1	Utility reserves the right to increase or decrease the number of items under the AMISP Contract subject to the limit of - 20% (twenty percent) up to +30% (thirty percent) of the existing number of items (as provided in Form 1 given in Section 5), covered under the AMISP Contract, without any change in the unit prices or other terms and conditions of the AMISP Contract and the Bid.
28. **Letter of Award**	28.1	Prior to the expiry of the period of Bid validity, Utility shall notify the successful Bidder, in writing, by issuing the Letter of Award, that its Bid has been accepted.
	28.2	Until the AMISP Contract is prepared and executed, the notification of award and its subsequent acceptance by the successful bidder shall constitute a binding contract.
29. **Signing of Contract and Contract Performance Security**	29.1	Within 21(twenty-one) Days of receipt of the Letter of Award, the successful Bidder shall sign the AMISP Contract.
	29.2	The Utility shall, as a condition precedent to the award of the contract to the selected bidder, establish a Payment Facility as mentioned in GCC Clause 5.2
	29.3	Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall furnish the Performance Security, using for that purpose the format of Performance Security given in Form 1 in Section 8. Immediately upon furnishing of Performance Security, AMISP may request the Utility to execute the AMISP Contract.
	29.3.1	Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall submit a copy of the agreement between each of the Sub-contractor(s) and the Bidder, in case the Sub-contractor(s) is not the Sole Bidder/ a member of the Consortium, guaranteeing back-to-back service and support for the total duration of the project. In case the bidder proposes RF as the communication technology, the successful bidder shall submit a copy of the agreement between the RF Technology/ solution provider(s) and the Bidder, guaranteeing back-to-back service and support for the total duration of the project.
	29.4	In case the Selected Bidder is a sole bidder or a bidding consortium, the members of the consortium shall incorporate themselves as a company called the Special Purpose Vehicle (SPV) under the Companies Act, 2013with 100% equity ownership to execute the Project. The SPV so incorporated

		shall sign the contract agreement along with the Selected Bidder. *Note: If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from compliance to Clause 29.4 of Section 3.*
	29.5	Failure of the Successful Bidder to submit the above-mentioned Performance Security or submit the above-mentioned agreement or delay in signing the AMISP Contract or if the successful bidder withdraws, shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security and the bidder may be debarred for future business with Discom. In that event, Utility may award the AMISP Contract to the next lowest Bidder (based on result of reverse auction) at new L-1 Rate. In case, next lowest bidders didn't accept the offer, the work will be awarded to further next lowest bidder in the ranking of lowest amount quoted in reverse auction.
	29.6	In case no bidder accept the L1 rate, the utility may re-issue the RFP.
30. **Additional Security**	30.1	In case % of equity participation of any of the consortium members in the SPV is less than 10% or if any of the consortium members is not willing to be a part of the SPV to be formed, except when the said consortium member is a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU, the bidder would have to furnish an additional security as per SCC.
	30.2	Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall furnish the additional Security, using for that purpose the format of Additional Security given in Form 3 in Section 8. Immediately upon furnishing of Additional Security, AMISP may request the Utility to execute the AMISP Contract.
	30.2.1	Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall submit a copy of the agreement between the said consortium member/s*(whose % of equity participation in the SPV is less than 10% or the said member who is not willing to be a part of the SPV to be formed)* and the lead Bidder, guaranteeing back-to-back service and support for the total duration of the project.
	30.3	Failure of the Successful Bidder to submit the above-mentioned additional Security or submit the above-mentioned agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event, Utility may award the AMISP Contract to the next lowest Bidder.

E. Bid Data Sheet

ITB Reference	A. General Provisions
1.1 (e)	Incorporation of a Special Purpose Vehicle (SPV) by the Selected Bidder for project implementation would be mandatory, in both cases, where the Bidder is either a Sole bidder or a Consortium. However, if a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, then creation of an SPV is not mandatory.
1.1 (cc)	Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited (MPPKVVCL, Indore) is a Company incorporated under the provisions of the Companies Act, 1956 and is a Government of Madhya Pradesh Undertaking. MPPMCL is the holding Company of three Power Distribution Companies in MP. Utility is a distribution licensee and is engaged in the function of distribution and retail supply of electricity. Utility intends to issue this Request for Proposal for the selection and appointment of Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis through E-reverse auction mode only.
1 (mm)	The scope of services of the AMISP is to implement end-to-end smart metering in the selected AMI Project area, operating the AMI System for 'Total Meter-months' and thereafter transfer the ownership of the entire AMI system along with its valid licenses, and any data collected during the Project to the DISCOM at the end of the Contract Period. The functions of AMISP shall include the following: i. Supply, installation, integration, testing and commissioning of Smart pre-paid metering, Communication Infrastructure, Head End System (HES), Consumer Portal, Mobile Application, Network Operation cum Monitoring Centre (NOMC) along with necessary hardware and software ii. AMI System integration iii Integration with Meter Data Management system (MDM) and deployment on cloud as per the specifications defined in this Contract; iv. Consumer indexing on de-novo basis v. Development of a comprehensive consumer engagement plan vi. Generation of automated energy audit reports vii. Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system viii. Training of DISCOM personnel ix. Other activities to be carried out to ensure successful installation and commissioning.
2.2	Bidding against RFP shall be conducted through/ with Electronic –Procurement (e-Procurement/ e- Tendering) System. Utility shall use the following Electronic-Procurement system to manage this Request for Proposal (RFP) process: **[MP TENDER Portal (https://mptenders.gov.in)]** The electronic-procurement system shall be used to manage the following part of the RFP process:

	[e.g., issuing RFP, corrigendum/ addendums, submissions of Proposals, opening of Proposals etc.] To aid and facilitate the Bidders on e-Procurement/ e-Tendering process a detailed manual on the same titled **Bidder Help Manual for e-Bidding** has been provided annexed to the Bid Data Sheet as **Annexure I (BDS)**. The same may be utilized by the Bidders.
2.2.2	**CE (Purchase): Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited** **Regd. Office :; GPH COMPOUND, POLOGROUND, INDORE** **Ph.no. (Direct) 0731-2426144, 166, 150**
2.3	The name of the Contract is: Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on DBFOOT basis.
2.4	Standard brief regarding detail of existing systems relevant to the AMI Project: 1. Bidders are advised to visit and examine the site and existing facilities, and obtain for itself, on its own responsibility and cost, all information that may necessary for preparing the Bid and entering into the AMISP Contract. The cost of visiting the site shall be at the Bidder's own expense 2. The Bidder and any of its personnel or agents shall be9 granted permission, through the assistance of the Utility, by the Utility to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Utility and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of/or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.
2.6	**A Pre-Bid Meeting will be held as per the details below.** **Date of Pre-Bid Meeting: 23.03.2026** **Time: 15:00** Hours (IST) **Address: MPPKVVCL, Indore, Corporate office, GPH COMPOUND, POLOGROUND, INDORE,** **Ph.no. 0731-2426144,166** **E-mail: sepurchase06@gmail.com** **Contact person/Meeting coordinator:** CE (Purchase) *Due to prevailing COVID-19 conditions and as per the applicable directives and SoP, if so necessitated the pre-bid meeting may be held over a Video Conferencing, Link for which will be made available seven days prior to holding this meeting at Utility website.*
2.8	Format for Sending Query to Utility *[Query shall be sent via email to E-mail ID to the Nodal Officer of Utility]* [Reference No.] From:

[Address of the Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility to insert details of Nodal Officer of Utility],
[*Utility to insert Address of Nodal Officer*]

Sub: Query.
Ref: [Utility to insert Tender Details].

Dear Sir/ Madam,
Please find below our query with respect to the RFP subject to the terms and conditions therein:

S. No.	Reference Clause No.	Page No.	Query
1.			
2.			
3.			

Thanking you,
Yours Sincerely,
[Insert Signature here]
[Insert Name here]
[Insert Designation here]

B. Preparation of Proposals

10.1 **Document Checklist and List of Forms**

S. No.	Document	RFP Section Reference
1.	Tender Fee	1,3
2.	List of Consortium Members and Subcontractor(s) (as applicable) as per the format prescribed in Form 1 given in Section 4	4
3.	Bidder Information as per the format prescribed in Form 2 given in Section 4	4
4.	Project Implementation Plan as per format provided in Form 3 given in Section 4	4

5.	Curriculum Vitae of key personnel as per format provided in Form 4 and Form 5 given in Section 4	4
6.	Bid Security in the form of Demand Draft or Bank Guarantee as per format prescribed in Form 6 given in Section 4	4
7.	Covering Letter for Submission of Bid by Sole Bidder / Lead Consortium Member as per format prescribed in Form 7 given in Section 4	4
8.	Consortium Agreement Format entered amongst all Members of the Bidding Consortium as per format prescribed in Form 8 given in Section 4	4
9.	Power of Attorney by each Consortium Member in favour of Lead Consortium Member as per format prescribed in Form 9 given in Section 4	4
10.	Power of Attorney by Lead Consortium Member/ Sole Bidder authorizing an Individual Designated Representative for the Consortium/ Bidder as per the format prescribed in Form 10 given in Section 4	4
11.	Letter of Consent by each Consortium Member reviewing each element of the Bid as per format prescribed in Form 11 given in Section 4	4
12.	**For Lead Member in case of Consortium Bidding / Sole Bidder Experience [Refer Clause 8.1 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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.* ii. Documentary evidence of Project completion such as client completion certificate, proof of payment received and client certificate of delivery of material, proof of asset capitalized in books of accounts (as applicable)/ and similar proofs along with contact	4

	13.1	**For System Integration Experience [Refer Clause 8.1 and 8.2 D1-D2 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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.* ii. Documentary evidence of completion of the Project or completion of Go-Live status (i.e., Go-live certificate, UAT testing certificate etc.) or other documentary evidence indicating completion (e.g., proof of payment received and client certificate for supply of material or similar proofs) along with contact details of the client; iii. Any other documentation for implementation performance/ operation. iv. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4)	4	

	13.2	**For Meter Manufacturer Eligibility [Refer Clause 8.2 A1-A6 in Section 2]:** a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 14); *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 other documentary evidence indicating completion of supply (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) Any other documentation for implementation performance/ operation d) A valid registration certificate of manufacturing unit along with Self-declaration by manufacturer and factory license certificate for requisite facilities. e) A valid ISO certificate on or before the date of submission of the bid f) A valid registration certificate mentioning issue/renewal/expiry date. g) A MAF signed on the letterhead of the Smart Meter manufacturer, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). h) Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4) i) Self-certification on Meter Manufacturer's Letter head duly signed by authorized signatory for compliance against Make in India provisions.		

	13.3	**For Head End System (HES) solution provider Eligibility [Refer Clause 8.2 B1-B4 in Section 2]:** a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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) Client certificate/ report issued by Client / MDMS OEM / solution provider and other documentation for implementation performance/ operation. c) A MAF signed on the letterhead of the HES Solution provider, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). d) Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4) e) Self-certification on HES solution provider's Letter head duly signed by authorized signatory for compliance against Make in India provisions.		
	13.4	**For Meter Data Management System (MDMS) solution provider Eligibility [Refer Clause 8.2 C1-C4 in Section 2]:** a) References along with requisite contract/ Purchase Order (PO)/ Work Order (WO)/ Client Certificate. The references should indicate client name, scope of work Project start date (as per the format prescribed in Form 13 given in Section 4); 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 on 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) Any other documentation for implementation performance/operation. d) A valid ISO certificate or CMMi certificate on or before the date of submission. e) A MAF signed on the letterhead of the MDMS Solution provider, addressed to the Sole/Lead Bidder (as per the format prescribed in Form 22). f) Agreement entered with the sole bidder/lead. g) Self-certification on MDM solution provider's Letter head duly signed by authorized signatory for compliance against Make in India provisions.		
	13.5	**For RF Technology/ Solution Provider Eligibility [Refer Clause 8.2 E1-E3 in Section 2]:** a. Certificate of Incorporation and Registration certificate along with Memorandum & Articles of Association. Copy of valid Licenses (In case of RF, Valid certificate issued by Wireless Planning & Coordination (WPC) Wing of the Ministry of Communications, GOI as on date of bid submission. b. References along with requisite contract/ PO/ WO. The references should indicate client name, scope of work, project start date and date of completion of installation. Certificate from the client on successful implementation of the project. *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.*		

	c. Signed agreements/ MoUs for integration of NIC module or Certificate of successful integration. d. A MAF signed on the letterhead of the RF Technology/ Solution provider, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). e. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4)		
14.	**For Financial Strength [Refer Clause 8.1 in Section 2]:** Audited Annual financial statements, Balance Sheet and P&L Account of all Consortium Members/ Sole Bidder for the respective Financial Years as per the format prescribed in Form 12 given in Section 4	4	
15.	List of Material and Services as per format provided in Form 14 given in Section 4	4	
16.	Table of Compliance as per format provided in Form 15 given in Section 4	4	
17.	Financial Bid as per format provided in Form 1 given in Section 5	5	
18.	Performance Security as per the format prescribed in Form 1 given in Section 8	8	
19.	Letter of Award as per the format prescribed in Form 2 given in Section 8	8	
20.	Copy of this RFP with sign and official seal on every page	1 to 8	
21.	Format for Sending Query to Utility for clarification	3	

12.1 Bid security

a) ~~The bids submitted in the Bid by the Bidder(s) shall be valid for a period of 180 days from the date of opening of the Bid. This shall also apply if the period of the Bid validity is extended. The bid security shall be valid for a period of minimum 300 days (i.e. 180 days bid validity + 120 days) from the initial date of opening of tender as mentioned in the published NIT. If the date of opening is extended, the bidders who already submitted bid are having Bid Security - BG Validity based on initial date of opening rather than extended date of opening .Hence the bid security validity shall be kept based on initial date of opening for avoiding complications at the time of bid opening~~.

b) All such offers, and terms and conditions set forth in this RFP shall be valid for the AMISP till the successful completion of the Project as certified by Utility. In exceptional circumstance, Utility may solicit the Bidder's consent to an extension of the Bid validity period. The request and responses thereto shall be made in writing or by email. If a Bidder accepts to extend the validity, the Bid Security shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request will not be required or permitted to modify its Bid.

	c) Offers should be kept open for acceptance for at least 180 days from the date of opening of Bid. Those who do not agree for a validity of 180 days will do so at their own risk and no request for extending the validity is likely to be made from this office. However, if due to any circumstances, beyond control, bidders are advised to extend the validity, they shall not be permitted to revise their rates, offer any rebate or concession while extending the validity which may materially result in any reduction or increase in the computed prices of their original offer. d) No offer will be accepted without Earnest Money Deposit, unless exempted by the Purchaser. If on opening of tender any discrepancy in EMD amount is noticed, the offer shall be rejected. e) The required amount of EMD shall be accepted through online payment. The Bidders are required to invariably upload the valid documentary evidence of submission of EMD without which online offer i.e. Technical offer & Price schedule shall not be opened. f) The EMD validity shall be up to 180 days from the next day of the final bid submission date i.e. bid deadline. For all tendering modes and methods, EMD shall be submitted by bidders along with the bid, which shall be examined prior to the opening of the Techno-commercial and Financial proposal. In absence of EMD, Techno-commercial and Financial proposal shall be treated as unresponsive and the same shall be retained with the Purchaser.
12.2	Currency and the amount of Bid Security to be furnished by the Bidder is: Currency: INR Amount: 1 Lakh (to be paid online)
12.3(a)	~~Banks by whom Bank Guarantee is required to be issued:~~ ~~[…*Utility to indicate the details*…]~~
12.3(a)	~~Bid Security may be furnished in other forms mentioned below:~~ ~~[…*Utility to indicate the details if Bid Security in forms other than Bank Guarantee is acceptable, otherwise indicate 'Not Applicable'*…]~~
13.1	Clarifications may be requested no later than 07 Days prior to the Pre-bid meeting. Request to be sent at: **CE (Purchase)** **M.P. PASHCHIM KSHETRA VIDYUT VITARAN CO. LTD.** **Regd. Office: GPH COMPOUND, POLOGROUND, INDORE** **Ph.no. (Direct) 0731-2426144, 166** **E-mail: sepurchase06@gmail.com**
15.13	Number of years: 10 years
16.4	Value of lump-sum payment for each meter type is as indicated below: INR 900 per Smart meter.

C. Submission, Opening and Evaluation	
17.3	Bidder shall submit all the requisite documents and forms via online mode through e-tendering portal. No hardcopy will be allowed to submit related to this RFP.
17.4	Bidder shall submit scanned version of all requisite documents and forms in original duly attested along with details of required attestation.
17.6	Details to be marked on the Technical envelope & to be submitted/uploaded online:: RFP no XX Name of RFP: Bid submission deadline: Time and date of Bid opening: Name of Lead Consortium Member/ Sole bidder: Sealed Envelope(s) to be addressed to & to be submitted/uploaded online: **CE (Purchase)** **M.P. PASHCHIM KSHETRA VIDYUT VITARAN CO. LTD.** **Regd. Office: GPH COMPOUND, POLOGROUND, INDORE** **Ph.no. (Direct) 0731-2426144, 166** **E-mail: sepurchase06@gmail.com**
17.10	The Bid Submission Deadline is: Date: 06/04/2026 Time: ***03:00 PM.***
19.1	The Technical Bids/ Proposals shall be opened online as indicated below: The opening shall take place at: **Madhya Pradesh Pashchim Kshetra Vidyut Vitaran Company Limited** **Regd. Office: GPH COMPOUND, POLOGROUND,Date: *XX/XX/XX*** **Time: *XX:XX PM*** ~~Due to prevailing COVID-19 conditions if necessitated and, the bid opening meeting may be held over a Video Conferencing, Link for which will be made available at least 7 Days prior to the Bid Opening event, at Utility website:~~ www.mpwz.co.in

Annexure I (BDS)

Bidder Help Manual for E-Bidding

GUIDELINES TO BIDDERS FOR IMPLEMENTATION OF E-PROCUREMENT SYSTEM

Note: These conditions will over-rule the conditions stated in the Tender documents, wherever relevant and applicable.

The bidders are required to submit soft copies of their bids electronically on the MP TENDER Portal **(**https://mptenders.gov.in**)**, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the MP TENDER Portal, prepare their bids in accordance with the requirements and submitting their bids online on the MP TENDER Portal (https://mptenders.gov.in).

More information useful for submitting online bids on the MP TENDER Portal may be obtained at: https://mptenders.gov.in/nicgep/app.

(A) REGISTRATION

1) Bidders are required to enroll on the E-procurement module of the MP TENDER Public Procurement Portal (URL: https://mptenders.gov.in/nicgep/app) by clicking on the link "**Online bidder Enrollment**" on the MP TENDER Portal which is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the MP TENDER Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g.Sify / nCode / eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

(B) SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the MP TENDER Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the MP TENDER Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the MP TENDER Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

(C) PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.

2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. *Bidders can use "My Space" or ''Other Important Documents'' area available to them to upload such documents.* These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

(D) SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3) Bidder has to select online Tender fee payment and pay Tender fee online. PAYMENT OF TENDER FEE IS **MANDATORY** IN ANY CASE.
4) Bidder should prepare the EMD as per the instructions specified in the tender document.
5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
8) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
9) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

(E) ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. This should be as per timelines (about 'seek clarification' start & end dates) given in Tender only.
2) Any queries relating to the process of online bid submission or queries relating to MP TENDER Portal in general may be directed to the 24x7 MP TENDER Portal Helpdesk.

CE (Purchase)
MPPKVVCL, Indore

Section 4. Bidding Forms- Technical Proposal

Checklist of Required Forms

This Checklist shall be filled in and submitted by the bidder along with the Technical Bid. Except Form 1 given in Section 5 (to be completed and submitted by the Bidder in the Financial Bid) all other documents/ forms duly filled and complete in all respect are to be submitted by the Bidder in the Technical Bid.

S. No.	Document	Attached (Yes/ No)	For Official Use
1.	Tender Fee to be paid online		
2.	List of Consortium Members and Subcontractor(s) (as applicable) as per the format prescribed in Form 1 given in Section 4		
3.	Bidder Information as per the format prescribed in Form 2 given in Section 4		
4.	Project Implementation Plan as per format provided in Form 3 given in Section 4		
5.	Curriculum Vitae of key personnel as per format provided in Form 4 and Form 5 given in Section 4		
6.	Bid Security electronically submitted		
7.	Covering Letter for Submission of Bid by Sole Bidder / Lead Consortium Member as per format prescribed in Form7 given in Section 4		
8.	Consortium Agreement Format entered amongst all Members of the Bidding Consortium as per format prescribed in Form8 given in Section 4		
9.	Power of Attorney by each Consortium Member in favour of Lead Consortium Member as per format prescribed in Form9 given in Section 4		
10.	Power of Attorney by Lead Consortium Member/ Sole Bidder authorizing an Individual Designated Representative for the Consortium/ Bidder as per the format prescribed in Form 10 given in Section 4		
11.	Letter of Consent by each Consortium Member reviewing each element of the Bid as per format prescribed in Form 11 given in Section 4		

S. No.	Document	Attached (Yes/ No)	For Official Use
12.	**For Lead Member in case of Consortium Bidding / Sole Bidder Experience [Refer Clause 8.1 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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.* ii. Documentary evidence of Project completion such as client completion certificate, proof of payment received and client certificate of delivery of material, proof of asset capitalized in books of accounts (as applicable)/ and similar proofs along with contact details of the client.		
13.1	**For System Integration Experience [Refer Clause 8.1 and 8.2 D1-D2 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); *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.* ii. Documentary evidence of completion of the Project or completion of Go-Live status (i.e., Go-live certificate, UAT testing certificate etc.) or other documentary evidence indicating completion (e.g., proof of payment received and client certificate for supply of material or similar proofs) along with contact details of the client; iii. Any other documentation for implementation performance/ operation. iv. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4)		

S. No.	Document	Attached (Yes/ No)	For Official Use
13.2	**For Meter Manufacturer Eligibility [Refer Clause 8.2 A1-A6 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 14); *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.* ii. Documentary evidence of completion of the Project or other documentary evidence indicating completion of supply (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; iii. Any other documentation for implementation performance/ operation iv. A valid registration certificate of manufacturing unit along with Self-declaration by manufacturer and factory license certificate for requisite facilities. v. A valid ISO certificate on or before the date of submission of the bid. vi. A valid registration certificate mentioning issue/renewal/expiry date. vii. A MAF signed on the letterhead of the Smart Meter manufacturer, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). viii. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4) ix. Self-certification on Meter Manufacturer's Letter head duly signed by authorized signatory for compliance against Make in India provisions.		
13.3	**For Head End System (HES) solution provider Eligibility [Refer Clause 8.2 B1-B4 in Section 2]:** i. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO). The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4);		

S. No.	Document	Attached (Yes/ No)	For Official Use
	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. ii. Client certificate/ report issued by Client / MDMS OEM / solution provider and other documentation for implementation performance/ operation. iii. A MAF signed on the letterhead of the HES solution provider, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). iv. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4) v. Self-certification on HES solution Provider's Letter head duly signed by authorized signatory for compliance against Make in India provisions.		
13.4	For Meter Data Management System (MDMS) solution For provider Eligibility [Refer Clause 8.2 C1-C4 in Section 2]: 1. References along with requisite contract/ Purchase Order (PO)/ Work Order (WO)/ Client Certificate. The references should indicate client name, scope of work, Project start date (as per the format prescribed in Form 13 given in Section 4); 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. ii. Documentary evidence of completion of the Project on 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 iii. Any other documentation performance/operation. for implementation iv. A valid ISO certificate or CMMi certificate on or before the date of submission. V. A MAF signed on the letterhead of the MDMS Solution provider, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). vi. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4)		

S. No.	Document	Attached (Yes/ No)	For Official Use
	vii) on Self-certification MDM Provider's Solution Letter head duly signed by authorized signatory for compliance against Make in India provisions.		
13.5	**For RF Technology/ Solution Provider Eligibility [Refer Clause 8.2 E1-E3 in Section 2]:** i. Certificate of Incorporation and Registration certificate along with Memorandum & Articles of Association. Copy of valid Licenses (In case of RF, Valid certificate issued by Wireless Planning & Coordination (WPC) Wing of the Ministry of Communications, GOI) as on date of bid submission. ii. References along with requisite contract/ PO/ WO. The references should indicate client name, scope of work, project start date and date of completion of installation. Certificate from the client on successful implementation of the project. *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.* iii. Signed agreements/ MoUs for integration of NIC module or Certificate of successful integration. iv. A MAF signed on the letterhead of the RF Technology/ solution provider, addressed to the Sole/ Lead Bidder (as per the format prescribed in Form 22). v. Agreement entered with the sole bidder / lead bidder (as per format prescribed in Form 23 of section 4)		
14.	**For Financial Strength [Refer Clause 8.1 in Section 2]:** Audited Annual financial statements, Balance Sheet and P&L Account of all Consortium Members/ Sole Bidder for the respective Financial Years as per the format prescribed in Form 12 given in Section 4		
15.	List of Material and Services as per format provided in Form 14 given in Section 4		
16.	Table of Compliance as per format provided in Form 15 given in Section 4		

S. No.	Document	Attached (Yes/ No)	For Official Use
17.	Format for Technical & Financial Requirement- Relationship & Details of Equity Shareholding (Form 16)		
18.	Authorization from Parent / Affiliate of Sole Bidder / Member of Bidding Consortium whose technical / financial capability has been used by the Sole Bidder / Member of Bidding Consortium (Form 17).		
19.	Format of Undertaking by Technically/ Financially Evaluated Entity(ies) OR Undertaking from the Ultimate Parent Company. for total equity investment commitment, in the prescribed format in Form 18, to meet any shortfall in the equity investment by the Selected Bidder in the SPV.		
20.	Formats for Board Resolutions (Form 19 of section 4)		
21.	Copy of this RFP with sign and official seal on every page		
22.	Pre-Contract Integrity Pact as per Form 20 given in Section 4		
23.	Data Requirement Sheet as per Form 21 given in Section 4		
24.	Valid Empanelment certificate of the sole/ lead bidder for the proposed solution, issued by REC / committee constituted thereby		

Form 1: 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		
Communication Provider		
System Integrator		
MDM Provider		
HES Provider		
Cloud Service Provider / Managed Service Provider		
RF Solution Provider (if any)		
[Other] (if any)		

Form 2: Bidder Information

[Sole Bidder/ all Consortium Members must provide all documents required to prove/ substantiate its Eligibility as required in Eligibility Criteria Clause 4 in section 2 for each Consortium Member]

S.No.	Information Requirement	Details
1	Company Name and Details	
2	Address of its place of business in India	
3	List of board of directors or regulating/controlling body	
4	Attested copy of Certificate of Registration/ Incorporation issued by the Registrar of Companies	
5	Memorandum and Articles of Association or document constituting the company and regulating its affairs	
6	Certificate of Commencement of Business issued by the Registrar of Companies	
7	Copy of the Goods and Services Tax (GST) Registration Certificate	
8	Provident Fund (PF) Certificate indicating PF Code	
9	Copy of Permanent Account Number (PAN)Card	
10	Copy of the Goods and Services Tax (GST) Registration Certificate	
11	Audited annual financial statements and financial Net worth for the last three years	
12	Any other papers or documents required by Utility at a later stage or in future	

Form 3: Project Implementation Plan

The Bidder shall submit a preliminary Project implementation plan along with the Bid which shall include at least the following activities:

a) *Understanding of Utility 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) *Data Privacy Approach;*
m) *Cyber Security Approach;*
n) *Site survey;*
o) *Installation & Field update schedule;*
p) *Repair and Maintenance Schedule including details on Spares Management;*
q) *Training schedule;*

Form 4: Bidder's Representative and Key Personnel

[Bidders should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the AMISP Contract. The data on their experience should be supplied using the Form 5given in Section 4 below for each candidate.]

1.	**Title of position:** Project Manager	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g., attach high level Gantt chart*]
2.	**Title of position:** *[System Integration Specialist]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g., attach high level Gantt chart*]
3.	**Title of position:** *[Cyber Security Specialist]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g., attach high level Gantt chart*]
4.	**Title of position:** *[Communication Technology Specialist]*	
	Name of candidate:	
	Duration of appointment:	[*insert the whole period (start and end dates) for which this position will be engaged*]
	Time commitment: for this position:	[*insert the number of days/week/months/ that has been scheduled for this position*]
	Expected time schedule for this position:	[*insert the expected time schedule for this position (e.g., attach high level Gantt chart*]

Form 5: Resume and Declaration

Name of Bidder:

Position [*#1*]: [*title of position*]		
Personnel information	**Name:**	**Date of birth:**
	Address:	**E-mail:**
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: *[language and levels of speaking, reading and writing skills]*	
Details		
	Address of employer:	
	Telephone:	**Contact (manager / personnel officer):**
	Fax:	
	Job title:	**Years with present employer:**

Summarize professional experience in reverse chronological order. Indicate technical and managerial experience relevant to the Project.

Project	**Role**	**Duration of involvement**	**Relevant experience**
[main project details]	*[role and responsibilities on the project]*	*[time in role]*	*[describe the experience relevant to this position]*

Declaration

I, the undersigned *[insert either "Contractor's Representative" or "Key Personnel" as applicable]*, certify that to the best of my knowledge and belief, the information contained in this Form 5 correctly describes myself, my qualifications, and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Bid:

Commitment	**Details**
Commitment to duration of contract:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*

Time commitment:	*[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]*

I understand that any misrepresentation or omission in this Form may:

(a) be taken into consideration during Bid evaluation;

(b) result in my disqualification from participating in the Bid;

(c) result in my dismissal from the contract.

Name of Contractor's Representative or **Key Personnel: [*insert name*]**

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day month year): _____

Form 6: Format of Bank Guarantee for Bid Security

[To be on non judicial stamp paper with stamp value of 0.25% of BG amount or maximum Rs. 25000, duly signed on each page. Foreign entities submitting Bid are required to follow the applicable law in their country]

Reference No. ……. Bank Guarantee No……. Dated: …….

To:
[Utility]
[Address]

Dear Sir/ Madam,

WHEREAS…… [Insert name of the Sole Bidder/Lead Consortium Member] with address ……. [Insert address of Sole Bidder /Lead Consortium Member] having its registered office at ……. [Insert address of the Sole Bidder /Lead Consortium Member] (Hereinafter, the "Bidder") wishes to participate in Tender No. [Tender Details] (the "RFP") issued by [Utility] (hereinafter, the "Utility") for Appointment of AMISP for Smart Metering on DBFOOT basis.

And WHEREAS a Bank Guarantee for [Amount] valid [Date] is required to be submitted by the Bidder along with the RFP.

We, …….[Insert name of the Bank and address of the Branch giving the Bank Guarantee] having our registered office at …….[Insert address of the registered office of the Bank] hereby give this Bank Guarantee No. …….[Insert Bank Guarantee number] dated …….[Insert the date of the Bank Guarantee], and hereby agree unequivocally and unconditionally to pay immediately on demand in writing from the Utility any officer authorized by it in this behalf any amount not exceeding [Amount] to the said Utility on behalf of the Bidder.

We ……. [Insert name of the Bank] also agree that withdrawal of the Bid or part thereof by the Bidder within its validity or non-submission of Performance Security by the Bidder within the stipulated time of the Letter of Award to the Bidder or any violation to the relevant terms stipulated in the RFP would constitute a default on the part of the Bidder and that this Bank Guarantee is liable to be invoked and encashed within its validity by the Utility in case of any occurrence of a default on the part of the Bidder and that the amount is liable to be forfeited by the Utility.

This Guarantee shall be valid and binding on this Bank up to and inclusive of ……. [Insert the date of validity of the Bank] and shall not be terminable by notice or by Guarantor change in the constitution of the Bank or the firm of the Bidder Or by any reason whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, conceded with or without our knowledge or consent by or between the Bidder and the Utility.
NOTWITHSTANDING anything contained hereinbefore, our liability under this guarantee is restricted to [Amount]. Our Guarantee shall remain in force till [Date]. Unless demands or claims under this Bank Guarantee are made to us in writing on or before [Date], all rights of the Beneficiary under this Bank Guarantee shall be forfeited, and we shall be released and discharged from all liabilities there under.

[Insert the address of the Bank with complete postal branch code, telephone and fax numbers, and official round seal of the Bank]	*[Insert signature of the Bank's Authorized Signatory]*
Attested	
……. [Signature] (Notary Public)	
Place: …….	Date: …….

INSTRUCTIONS FOR SUBMITTING BANK GUARANTEE

1. Bank Guarantee to be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution. Foreign entities submitting Bids are required to follow the applicable law in their country.
2. The Bank Guarantee by Bidder shall be given from any Scheduled Commercial Bank.
3. The full address along with the Telex/Fax No. and e-mail address of the issuing bank to be mentioned.

Form 7: Format of Covering Letter by Sole bidder/ Lead Consortium Member

[Covering Letter shall be on the official letterhead of the Sole bidder/ Lead Consortium Member of the Bidding Consortium]

[Reference No.]
From:
[Address of the Lead Consortium Member/ Sole Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis

Ref: [Tender Details]

Dear Sir/ Madam,

We, the undersigned ……. *[Insert name of the Lead* Consortium Member/ Sole Bidder*]* having read, examined and understood in detail the RFP for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis hereby submit our Bid comprising of Technical and Financial Bids.

1. We give our unconditional acceptance to the RFP including but not limited to all its instructions, terms and conditions, and formats attached thereto, issued by Utility, as amended. In token of our acceptance to the RFP, the same have been initialed by us and enclosed to the Bid. We shall ensure that our Consortium shall execute such requirements as per the provisions of the RFP and provisions of such RFP shall be binding on us.

2. **Fulfilment of Eligibility**

We undertake that we fulfil the Eligibility Criteria stipulated in the RFP and fulfil all the eligibility requirements as the Lead Consortium Member/ Sole Bidder as outlined in the RFP.

We hereby confirm that in accordance with Clause 7 of Section 2 of the RFP, we are herewith submitting legally binding undertaking supported by a board resolution from the ……....*[insert name of Technically Evaluated Entity and/or Financially Evaluated Entity or its Ultimate Parent Company, as the case may be]* that all the equity investment obligations of ……. *[insert name of the Sole Bidder/ Lead Consortium Member]* shall be deemed to be equity investment obligations of the …… *[insert name of Technically Evaluated Entity and/or Financially Evaluated Entity or its Ultimate Parent Company, as the ease may be]* and in the event of any default by…….…..... *[insert name of the Sole Bidder/ / Lead Consortium Member]*, the same shall be met by ……. *[insert name of Technically Evaluated Entity and/or Financially Evaluated Entity or its Ultimate Parent Company, as the case may be]*.

[To be inserted only in ease the Bidder has sought qualification on the basis of technical and financial capability of its Affiliate(s) and/or its Parent]

3. Bid Security

~~We have enclosed a Bid Security of [Amount] in the form of a Bank Guarantee No. ……. *[Insert Bank Guarantee Number]* (OR Demand Draft) dated …….*[Insert date of the Bank Guarantee]* as per Form 6 given in Section 4 from …….*[Insert name of Bank providing Bid Bond]* and valid up to [Date].~~

4. No Deviation

We have submitted our Financial Bid strictly as per terms and formats of the RFP, without any deviations, conditions and without mentioning any assumptions or notes for the Financial Bid in the said format.

5. Acceptance

We hereby unconditionally and irrevocably agree and accept that the decision made by Utility in respect of any matter regarding or arising out of the RFP shall be binding on us. We hereby expressly waive any and all claims in respect of Bid process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfil our obligations with regard to fulfilling our obligations as per the RFP.

6. Familiarity with Relevant Indian Laws and Regulations

We confirm that we have studied the provisions of the relevant Indian laws and regulations as required to enable us to submit this Bid and execute the RFP Documents, in the event of our selection as Selected Bidder. We further undertake and agree that all such factors as mentioned in the AMISP Contract have been fully examined and considered while submitting the Bid.

7. Compliance with applicable laws/ guidelines for public procurement in India

We confirm that we shall adhere to applicable laws for public procurement in India including the guidelines issued in Order No. F/No.6/18/2019-PPD by Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23 July 2020, Order No No.9/16/2016-Trans-Part (2) dated 18 November 2020, latest Government of India Guidelines for Make in India, Domestically manufactured products, Atmanirbhar Bharat and circulars DIPP Office Memorandum No. P-45021/2/2017-PP (BE-II) date:16th Sept. 2020, MeitY Circular No.1(10)/2017-CLES dated 06.12.2019 and Order No. 11/05/2018-Coord. by the Ministry of Power dated 17 September 2020 including any amendments or modifications to the same from time to time.

8. Contact Person

Details of the contact person representing our Bidding Consortium/ Sole Bidder (registered Company) supported by the Power of Attorney prescribed in Form 10 given in Section 4 of the RFP are furnished as under:

Name: …….
Designation: …….
Company: …….
Address: …….
Mobile: …….
Phone: …….
Fax: …….
Email: …….

1. We are submitting herewith the Technical Bid containing duly signed formats, both in electronic and physical forms, (duly attested) as desired by you in the RFP for your consideration.

2. We are also submitting herewith the Financial Bid in electronic form only, as per the terms and conditions in the RFP.

9. It is confirmed that our Bid is consistent with all the requirements of submission as stated in the RFP and subsequent communications from Utility.

10. The information submitted in our Bid is complete, strictly as per the requirements stipulated in the RFP and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our Bid.

11. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of 1 (one) year from the Bid Submission Deadline.

12. We confirm that we have not taken any material deviation so as to be deemed non-responsive with respect to the provisions stipulated in the RFP.

13. We confirm that no order/ ruling has been passed by any Competent Court or Appropriate Commission against us or any of our Consortium Members or in the preceding 1 (one) year from the Bid Submission Deadline for breach of any contract and that the Bid Security submitted by us or any of our Consortium Members has not been forfeited, either partly or wholly, in any bid process in the preceding 1 (one) year from the Bid Submission Deadline.

14. We confirm that we are not currently blacklisted/ debarred/ banned/ suspended as per Clause 5 under Section 2 of this RfP.

15. We are registered/ exempt from registering in accordance with applicable laws
[Evidence of valid registration by the Competent Authority shall be attached if applicable]

16. We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety (including Reverse Auction).

Dated the ……. *[Insert date of the month]* day of ……. *[Insert month, year]* at ……. *[Insert place]*.

Thanking you,
Yours Sincerely,
[Insert Signature here]
[Insert Name here]
[Insert Designation here]

Form 8: Format of Consortium Agreement to be entered amongst all Members of a Bidding Consortium

[To be on non-judicial stamp paper of Rs. 1000 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. [Tender Details] (the "RFP") dated [Date]

1. **THIS Consortium Agreement** (hereinafter referred to as "Agreement") executed on this ..... *[date]* day of ..... *[month]*, ... *[year]* between
2. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at ....., (hereinafter called "**Party 1**," or "**Lead Consortium Member**" which expression shall include i[ts successors, executors and permitted assigns);
3. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at ....., (hereinafter called "**Party 2**," which expression shall include its successors, executors and permitted assigns);
4. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at ....., (hereinafter called "**Party 3**," which expression shall include its successors, executors and permitted assigns);

5. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at ....., (hereinafter called "**Party n**," 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.]

WHEREAS the Parties above named are entering into this Consortium Agreement for the purpose of submitting the Bid in response to the RFP and in the event of selection as Selected Bidder to comply with the requirements as specified in the RFP and ensure execution of the AMISP Contract as may be required to be entered into with Utility.

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

WHEREAS the RFP stipulates that the Bidders applying as a Bidding Consortium shall submit a legally enforceable Consortium Agreement in a format specified in the RFP, 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 RFP, as specified herein.
WHEREAS any capitalized term in this Agreement shall have the meaning ascribed to such term in the RFP document.

NOW THEREFORE, THIS AGREEMENT 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 Utility, 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. In the event the Consortium is selected pursuant to the Bidding Process, the shareholding of all each of the Consortium Members in the AMISP shall be as under:

S. No.	Name of the Bidding Company/ Member in case of a Bidding Consortium	Name of the Company investing in the equity of the SPV	Relationship with Sole Bidder / Member of the Bidding Consortium	% of equity participation in the SPV
1.	Lead Consortium Members			(Not Less than 51%)
2.	Consortium Member 1			(Not Less than 10%)
3.	Consortium Member 2			(Not Less than 10%)
4.	Consortium Member 3			(Not Less than 10%)
5.	Consortium Member 4			(Not Less than 10%)

* In case the Bidder proposes to invest through its Affiliate(s) / Parent Company / Ultimate Parent Company, the Bidder shall declare shareholding pattern of such Affiliate(s) / Parent Company / Ultimate Parent Company and provide documentary evidence to demonstrate relationship between the Bidder and the Affiliate(s) / Parent Company / Ultimate Parent Company. These documentary evidence could be, but not limited to, demat account statement(s) / Registrar of Companies' (ROC) certification / share registry book, etc. duly certified by Company Secretary.

*If % of equity participation of any of the consortium members in the SPV is less than 10% or if any of the consortium members is not willing to be a part of the SPV to be formed, except when the said consortium member is a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU, the bidder would have to furnish an additional security as per **SCC**.

*If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium,

then creation of an SPV is not mandatory and in such a case, the bidder shall be exempted from providing an additional security as per **SCC**.

4. Each Consortium Member 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 RFP. 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.

5. In case of any breach of any of the commitment as specified under this Agreement by any of the Consortium Members, the Lead Consortium Member of the Consortium shall be liable to meet the obligations as defined under the RFP.

6. 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.

7. The Members expressly agree to adhere to all the terms and conditions of the RFP and confirm that we don't have any Conflict of Interest (as defined in the RFP).

8. This Consortium Agreement shall be construed and interpreted in accordance with the Laws of India and Courts at [Place] shall have the exclusive jurisdiction in all matters relating thereto and arising there under.

9. It is hereby agreed that the Lead Consortium Member shall furnish the Bid Security, as stipulated in the RFP, on behalf of the Bidding Consortium.

10. It is hereby agreed that in case of selection of Bidding Consortium as the AMISP, the Parties to this Consortium Agreement do hereby agree that they shall furnish the Performance Security and other commitments to Utility as stipulated in the RFP and AMISP Contract. The Lead Member shall be responsible for ensuring the submission of the Performance Security and other commitments on behalf of all the Consortium Members.

11. It is further expressly agreed that the Consortium Agreement shall be irrevocable and, for the AMISP, shall remain valid over the term of the Project, unless expressly agreed to the contrary by Utility.

12. 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. The representation by the Lead Member shall be deemed to be on behalf of and binding on all members of the Consortium.

13. 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-A 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 RFP Documents.

14. It is clearly agreed that the Lead Consortium Member shall ensure performance indicated in the RFP. In the event 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.

15. 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 Utility.

16. 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 Utility.

Common Seal of ..... has been affixed in my/ our presence pursuant to Board Resolution dated	For M/s. ..... (Party 1) *[Signature of Authorized Representative]* ..... *[Name of the Authorized Representative]* *[Designation of the Authorized Representative]*

Witness 1

[Signature of Witness 1]
.....
Name:

Designation Witness 2 [Signature of Witness 2] ..... Name: Designation:	
..	
N. Common Seal of ..... has been affixed in my/ our presence pursuant to Board Resolution dated	For M/s. ..... (Party N) *[Signature of Authorized Representative]* ..... *[Name of the Authorized Representative]* *[Designation of the Authorized Representative]*
N.1. Witness 1 [Signature of Witness 1]	N.2. Witness 2 [Signature of Witness 1] .....

Name: Designation:	Name: Designation:

Annexure-A

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

.

.

N. Roles and Responsibilities of the Party N

Form 9: Format of Power of Attorney by Consortium Member in favour of Lead Consortium Member

Format of Power of Attorney by Consortium Member in favour of Lead Consortium Member
[To be on non-judicial stamp paper of Rupees One Thousand Only (INR 1000/-)]

WHEREAS [Utility] has issued for Tender No. [Tender Details] (the "RFP") dated [Date] for inviting Bids in respect of Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis (the "Project") on the terms contained in the RFP;

WHEREAS M/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, the Members of the Consortium hereby designate M/s …….. [Insert name of the Lead Member] 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 Member 1], ……. [Insert name and address of the registered office of the Member 2],….., ……. [Insert name and address of the registered office of the Member n] do hereby 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 RFP issued by Utility including signing and submission of the Bid and all documents related to the Bid as specified in the RFP, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document, which Utility may require us to submit. The aforesaid attorney is further authorized for making representations to Utility named in the RFP, and providing information / responses to Utility, representing us and the Consortium in all matters before Utility named in the RFP, and generally dealing with Utility named in the RFP 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 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.

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 executants)
(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……

1. **WITNESS1. ……. (Signature)**
   Name …….
   Designation.....……..
2. **WITNESS2.....……..... (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 favor of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).*

Form 10: Format of Power of Attorney by Lead Consortium Member / Sole Bidder authorizing an Individual Designated Representative for the Consortium

[To be on non-judicial stamp paper of Rupees One Thousand Only (INR 1000/-) . 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/ Sole Bidder]* do hereby constitute, appoint, nominate and authorize Mr./Ms. …… *[Insert name and residential address]*, who is presently employed with us and holding the position of ……. as 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 AMISP for Smart Prepaid Metering on DBFOOT basis (the "Project") issued by [Utility], 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 Utility may require us to submit. The aforesaid attorney is further authorized for making representations to Utility, and providing information / responses to Utility, representing us in all matters before Utility, and generally dealing with Utility in all matters in connection with our Bid till the completion of the bidding process as per the terms of the RFP.

We 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 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……

1. **WITNESS 1. ……. (Signature)**

Name …….

Designation.....……

2. **WITNESS 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).*

Form 11: Format of Letter of Consent by Sole Bidder/ Consortium Member reviewing each element of the Bid

[On the letter head of Sole Bidder/ each Member of the Consortium including Lead Member]

[Reference No.]

From:
[Address of the Lead Consortium Member/ Sole Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis.
Ref: [Tender Details]

Dear Sir/ Madam,

We, ……..…… [Insert name of the undersigned Sole Bidder/ Consortium Member] Sole Bidder/ Member of Consortium and Lead by ……..…… [Insert name of the Lead Consortium Member] have read, examined and understood the RFP and RFP Documents for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis.

We hereby confirm our concurrence with the RFP including in particular the Bid / and Consortium Agreement submitted by ……..…… [Insert name of the Sole Bidder/ 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.

We hereby confirm that in accordance with Clause 7 of Section 2 of the RFP, we are enclosing legally binding undertaking supported by a board resolution from the ……. [insert name of Technically Evaluated Entity and / or Financially Evaluated Entity or its Ultimate Parent Company, as the case may be] that all the equity investment obligations of ……..[insert name of the Member] shall be deemed to be equity investment obligations of the …….[insert name of Technically Evaluated Entity and / or Financially Evaluated Entity or its Ultimate Parent Company, as the case may be] and in the event of any default…….. [insert name of the Member], the same shall be met by……... [insert name of Technically Evaluated Entity and / or Financially Evaluated Entity or its Ultimate Parent Company, as the case may be]. *[Insert if applicable]*

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]

Form 12: Format of Summary of Audited Financial Statements

<This form needs to be submitted by Sole Bidder/ Lead Consortium Member. In case of an AIF or Foreign Investment Fund using ACI, ACI would be considered as per the certificate issued by statutory auditor (or such other certificate as filed with the regulator in the relevant jurisdiction) not older than 1 (one) month prior to the date of Bid Submission>

[Reference No.]

From:
[Address of the Lead Consortium Member/ Sole Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Audited Financial Statement for ..... *[Insert name of Sole Bidder/Consortium Member]*.

Ref: [Tender Details]

Dear Sir/ Madam,

This is to certify that ..... *[Insert name of Sole Bidder/Consortium Member]* having its Registered Office at ..... *[Insert Registered Address of the Consortium Member]* are in the business of ..... *[Insert briefly the nature of the business]*, have recorded the following:

NETWORTH FOR LAST THREE FINANCIALYEARS				
S. No.	Name of Financially Evaluated Entity(ies)	Relationship with Bidder	Financial Year (FY)	Net worth Amount (In Indian Rupees)
1.				
2.				
3.				

Or

ACI FOR PRECEDING FINANCIALYEAR				
S. No.	Name of Financially Evaluated Entity(ies)	Relationship with Bidder	Financial Year (FY)	ACI Amount (In Indian Rupees)
1.				
2.				
3.				

TURNOVER OF LAST THREE FINANCIAL YEAR				
S. No.	Name of Financially Evaluated Entity(ies)	Relationship with Bidder	Financial Year (FY)	Turn over Amount (In Indian Rupees)
1.				
2.				
3.				

The above Net worth/ ACI/Turn over are arrived from our Audit Reports for the last three/ preceding[2] financial years duly submitted to the Income Tax Department along with our Audit Reports.

Hence, we certify from the records submitted to us. Thanking you,

Yours Sincerely,

I am aware that the Company (Name of Discom) is relaying this certificate as a valid proof of Financial Capability of the Company.
For, _____ Chartered Accountant Firm,
FRN No. _____
CA. _____ (Designation _____)
M. No. _____ UDIN No._____
Date : _____ Place: _____

Yours Sincerely,
[Insert Signature here]
[Insert Name here]
[Insert Designation here
Date: [Date]
Place: [Place]
Signature and Seal of Bidder

[2]In case ACI is used to meet the financial requirements

Form 13: Record of Similar Work Done (CA certified Form 13 shall be submitted by Lead/ Consortium Member only.)

S. No.	Name of Technically Evaluated Entity (ies)	Relationship with the Bidder	Date of PO/ WO	Contract Period	No. of Consumer, Nodes, etc.	Description of Work	PO/ WO Value (In INR)	Confirm attachment of PO/ WO	Confirm attachment of Installation Milestone/ execution certificate
1.									
2.									
3.									
4.									
5.									

I am aware that the Company (Name of Discom) is relaying this certificate as a valid proof of Financial Capability of the Company.
For, _____ Chartered Accountant Firm,
FRN No. _____
CA. _____ (Designation _____)
M. No. _____ UDIN No._____
Date : _____ Place: _____

Yours Sincerely,
[Insert Signature here]
[Insert Name here]
[Insert Designation here
Date: [Date]
Place: [Place]
Signature and Seal of Bidder

Form 14: List of Material and Services

Please Note: The list is indicative only. This needs to be detailed out and customized by [AMISP] basis Project requirement

Table 1: List of Materials and Services for Smart Meters [Indicative Only. To be defined by AMISP]

S. No.	Item Description	Country of Origin
1.	**Meters (including Communication module/NIC card)**	
1.1	Single phase whole current Smart Meter – Consumer Meter	
1.2	Three Phase whole current Smart Meter – Consumer Meter	
1.3	Three phase LT-CT operated Smart Meter – Consumer Meter	
1.4	Three phase CT/PT operated Smart Meter – HT Consumer	
2.	**Mandatory Spares**	
2.1	X% of Subtotal 1	
2.2	....	
..	..	
3.	**Installation & Commissioning**	
3.1	Supply, Installation, Commissioning & Testing & Integration with Existing System (if any)	
3.2	Meter Boxes	
..	..	
4.	**Other Requirement**	
4.1	Any other product/ services, if required, along with details.	
5.	**Communications Hardware**	
5.1	NIC/ Communication Module (price to be quoted only for sourcing additional quantity if required.	
5.2	Data Concentrator Units/Access points	

Table 2: List of Materials and Services for Software [Indicative Only. To be defined by AMISP] Suppliers should disclose the list of critical software components and their sources in line with Software bill of material guidelines issued by CERT-In for each software

S.No.	Item Description	Country of Origin
1.	**Application Software**	
1.1	Meter Data Acquisition Software (MDAS)/Head End System (HES)	
1.2		
1.3	....	
..	…	
2.	**Data Archiving Software**	
2.1	Data Archiving and SAN management software	
2.2	....	
..	..	
3.	**Network Management Software**	
3.1	Centralized network management software along with patch management & identity management	
3.2	Antivirus software for all machines in Network Operation cum Monitoring Center	
3.3	Access control software with single sign on feature	
…	….	
..	..	
4.	**Installation & Commissioning**	
4.1	Supply, Installation, Commissioning & Testing & Integration with Existing System (if any)	
4.2	....	
..	..	
5.	**Other Requirement**	
5.1	Any other product/ services, if required, along with details.	

Table 3: List of Materials and Services for Hardware [Indicative Only. To be defined by AMISP]

S. No.	Item Description	Country of Origin
1.	**Hardware for Network Operation cum Monitoring Centre**	
1.1	Work station consoles	
1.2	Firewall	
1.3	Router	
..	..	
2.	**Mandatory Spares**	

S. No.	Item Description	Country of Origin
2.1	X% of Subtotal 1	
2.2	....	
..	..	
3.	**Installation & Commissioning**	
3.1	Supply, Installation, Commissioning & Testing & Integration with Existing System (if any)	
3.2	....	
..	..	
4.	**Other Requirement**	
4.1	Any other product/ services, if required, along with details.	

Table 4: List of Materials and Services for Training [Indicative Only. To be defined by AMISP]

S. No.	Item Description	Country of Origin
1.	**Training at Site**	
1.1	Smart Meter & Communication network	
1.2	HES, Protocol, Database, User Interface, Display and Application software	
1.3	Computer System Hardware & Software	
1.4	....	
..	..	

Table 5: List of Materials and Services for Operation and Maintenance [Indicative Only. To be defined by AMISP]

S. No.	Item Description	Country of Origin
1.	**Operation and Maintenance**	
1.1	Operation of complete system (during warranty period) including providing communication link to Network Operation cum Monitoring Center as well as network connectivity for Cellular services for AMI System	

S. No.	Item Description	Country of Origin
1.2	Maintenance of complete System during AMI operations period	
1.3	....	

Table 6: List of Materials and Services for Infrastructure for Recharge through Feature Phones/ Offline Channels [Indicative Only. To be defined by AMISP] (Not Applicable)

S. No.	Item Description	Country of Origin
1.	**Infrastructure for Recharge**	
1.1	Retail distribution centres	
1.2	Workstation Consoles	
1.3	Computer System	
..	..	

Table 7: List of Materials and Services for Consumer Engagement Activities [Indicative Only. To be defined by AMISP]

S. No.	Item Description	Country of Origin
1.	**Consumer Engagement Activities**	
1.1	Consumer engagement plan	
1.2	Communication and media plan	
1.3	..	
2	**Implementation support for consumer engagement activities as per point 1**	
2.1	Knowledge Materials/ Tools/ Brochures	
2.2	Social media campaigns	
2.3	Press release/ ads/ newsletters	
2.4	Videos/ Film	
2.5	Consumer Surveys	
..	..	

Form 15: Table of Compliance

The Bidder shall submit 'Clause by Clause' compliance to the RFP document including the technical specifications and functional requirements (with amendments, if any) as per the format prescribed in Form 15

. The Bidder shall annotate the Table of Contents of each section to provide a high-level summary of compliance status. In all cases, the following symbols, and no others shall be used:

- **C - Bid complies with all requirements in the adjacent paragraph.**
- **A - Bid is not compliant with the requirements in the adjacent paragraph, but a functional alternative is proposed.**
- **X - Bid takes exception to the requirements of the adjacent paragraph and no functional alternative is proposed.**

Only one symbol shall be assigned to paragraph and shall indicate the worst-case level of compliance for that paragraph. This annotation may be handwritten.

The Bidder shall also underline, on the compliance copy, all requirements to which exceptions have been taken (X) or to which alternatives have been proposed (A).

Each alternative shall be clearly and explicitly described. Such descriptions shall use the same paragraph numbering as the bid document sections addressed by the alternatives. All alternative descriptions shall be in one contiguous section of the bidder's proposal, preferably in the same volume, and titled "Alternatives." A separate section titled "Exceptions" shall also be provided containing any discussion or explanation chooses to provide concerning exceptions taken. Alternatives which do not substantially comply with the intent of the Bid documents will be considered exceptions.

Any clause which is not included in this compliance table shall be treated as "fully complied" or C.

The Utility will assess the merits of each alternative and exception and will be the sole judge as to their acceptance.

Form 16: Format for Technical & Financial Requirement- Relationship & Details of Equity Shareholding

[Reference No.]
From:
[Address of the Lead Consortium Member/ Sole Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis

Ref: [Tender Details]

Dear Sir/ Madam,

We certify that M/s ……..[insert name of the Sole Bidder / Consortium Members] have considered the technical and financial capability of its Parent and / or Affiliates, for the purpose of meeting Qualification Requirements as per the instructions provided in the RFP. The name of Parent and / or Affiliate, nature of relationship(s) with such Parent and / or Affiliate and details of equity holding are as follows:

Name of Company whose credentials considered	Type of credentials considered (technical and / or financial)	Relationship with Sole Bidder / Consortium Member (Parent / Affiliate)	Details of equity shareholding (refer notes below)
Company 1			
……..			
……..			
……..			
……..			

NOTES:

i) In case of Parent, the equity holding of the Parent in the Sole Bidder / Member of the Bidding Consortium, including the Lead Member of the Consortium, need to be specified,

ii) In case of Affiliate under direct control of Bidder, the equity holding of the Sole Bidder / Member of the Bidding Consortium, including the Lead Member of the Consortium in the Affiliate, needs to be specified.

iii) In case of Affiliate under common control of Parent, the equity holding of the Parent in the Affiliate of the Sole Bidder / Member of the Bidding Consortium, including the Lead Member of the Consortium, needs to be specified.

iv) Relationship Of Parent / Affiliate with Sole Bidder / Member Of Consortium to be at the most seven (7) days prior to the Bid Deadline (as per Clause 7 of Section 2 of the RFP)

Yours faithfully

……
(Signature and name of the authorized signatory of the Company and stamp)

Name: ……..

Date: ……

Place: ……

……
(Signature and Stamp of statutory Auditors of Sole Bidder / each Member of Bidding Consortium)

Name: ……..

Date: ……

Place: ……

Date: ……

Form 17: Authorization from Parent / Affiliate of Sole Bidder / Member of Bidding Consortium Whose Technical / Financial Capabilities has been used by the Sole Bidder / Member of Bidding Consortium

[On the Letter Head of the Parent /Affiliate]

[Reference No.]
From:
[Address of the Parent / Affiliate of Bidder / Member of Bidding Consortium]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Dear Sir,

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis

We refer to the RFP dated……. ('RFP') issued by you for selection of Bidder as Advanced Metering Infrastructure Service Provider for establishing the AMI System for "……[Name of Project]".

We confirm that M/s. ..... [lnsert name of Sole Bidder/ Consortium Member] has been authorized by us to use our technical and/or financial capability [strikeout whichever is not applicable] for meeting the Qualification Requirements for "……...[Name of Project]".

We have carefully read and examined in detail the RFP including in particular, Clause 7 of Section 2 of the RFP, and we are also submitting legally binding undertaking supported by a board resolution that all the equity investment obligations of M/s..... [lnsert Name of Sole Bidder / Consortium Member], shall be deemed to be our equity investment obligations and in the event of any default the same shall be met by us.

For and on behalf of …… [insert Name of Parent / Affiliated]

……
[Signature and Name of the authorized signatory of the Company and stamp]

Name: …….

Date: ……

Place: ……

Notes:

1. The above undertaking can be furnished by Ultimate Parent of Technically Evaluated Entity or Financially Evaluated Entity, as the case maybe, if legally binding undertaking is also furnished by the Ultimate Parent on behalf of such Financially Evaluated Entity/Technically Evaluated Entity.

Form 18: Format of Undertaking by Technically / Financially Evaluated Entity / Ultimate Parent Company

[On the Letter Head of the Technically / Financially Evaluated Entity / Ultimate Parent Company]

[Reference No.]
From:
[Address of the Technically / Financially Evaluated Entity / Ultimate Parent Company]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis

Dear Sir,

We refer to the Request for Proposal dated …… ('RFP') issued by you regarding setting up of AMI system for ……. [Name of the Project] on design, build, finance, own, operate and transfer basis.

We have carefully read and examined in detail the RFP and the RFP Project Documents, including in particular, Clause 2 and 4 of Section 7 of the RFP and Clauses 15 of Section 3 of the RFP, regarding submission of an undertaking regarding the investment in the equity share capital of …….. [Name of the SPV] and provisions for minimum equity holding and equity lock-in. We have also noted the amount of the equity investment required to be made in……[Name of SPV] by the …… [insert the name of the Bidder or the Consortium Member] for the Project.

In view of the above, we hereby undertake to you and confirm that in the event of failure of …….....[insert the name of the Bidder or the Consortium Member] to invest in full or in part, in the equity share capital of …….[Name of SPV] as specified in the Bid, we shall invest the said amount not invested by …….. [insert the name of the Bidder or the Consortium Member] in …… [Name of SPV] by purchase of existing shares or subscribing to the new shares of …… [Name of the SPV], as stipulated by you.

We have attached hereto certified true copy of the Board resolution whereby the Board of Directors of our Company has approved issue of this Undertaking by the Company.

All the terms used herein but not defined, shall have the meaning as ascribed to the said terms under the RFP.

Certified as true.

……
(Signature and Name of the authorized signatory of the Company and stamp)

Note:

1. Wherever required, extract of the charter documents and documents such as a Board resolution should be submitted for verification.
2. If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from submitting this form (Form 18 of Section 4).

Form 19: Formats for Board Resolutions

Format 1

Format of the Board resolution for the Sole Bidder / each Member of the Consortium / investing Affiliate / Parent Company / Ultimate Parent Company, where applicable

[Reference Clause 15 of Section 3 of the RFP and the illustrations in Annexure of this form]

[**Note:** The following resolution no. 1 needs to be passed by the Boards of each of the entity (ies) making equity investment]

The Board, after discussion, at the duly convened Meeting on ……. [Insert date]. with the consent of all the Directors present and in compliance of the provisions of the Companies Act. 1956/2013, passed the following Resolution:

1. **RESOLVED THAT** pursuant to the provisions of the Companies Act, 1956 / Companies Act 2013 (as the case may be) and compliance thereof and as permitted under the Memorandum and Articles of Association of the company, approval of the Board be and is hereby accorded for investment of .....% (.....per cent) of the total equity share capital……..[Name of SPV] representing the entire amount proposed to be invested by the company for the AMI system for …… [Name of Project], as per the terms of the RFP.

   [Note: Equity investment obligations by the Sole Bidder/each Member of the Bidding Consortium/investing Affiliate or Parent or Ultimate Parent should add up to 100%]

   [Note: In the event the Bidder is a Bidding Consortium, the following Board resolution no. 2 also needs to be passed by the Lead Member of the Bidding Consortium]

2. **RESOLVED THAT** approval of the Board be and is hereby accorded to contribute such further amount over and above the …… percentage (……%) limit to the extent becoming necessary towards the total equity share in the …….. [Name of SPV]. obligatory on the part of the company pursuant to the terms and conditions contained in the Consortium Agreement dated .....executed by the company as per the provisions of the RFP.

   [Note: In the event, the investing entity is an Affiliate or Parent or Ultimate Parent of the Bidder, the following Board resolution no. 3 shall also be passed by the Bidder]

3. **FURTHER RESOLVED THAT** the Board hereby acknowledges the Board Resolution(s) passed by the..... [Name of the Affiliate(s)/ Parent / Ultimate Parent] regarding the investment of.....(....%) of the equity share capital requirements of …….[Name of SPV], which is to be invested by the .....[Name of the Affiliate(s)/ Parent / Ultimate Parent] for the SPV as per the terms of the RFP.

   [Note: The following resolution no. 4 is to be provided by the Sole Bidder / Lead Member of the Consortium only]

4. **FURTHER RESOLVED THAT** MR/MS .....be and is hereby authorized to take all the steps required to be taken by the Company for submission of the Bid, including in particular, signing of the Bid, making changes thereto and submitting amended Bid, all the documents related to the Bid, certified copy of this Board resolution or letter or undertakings etc, required to be submitted to Utility as part of the Bid or such other documents as may be necessary in this regard.

   Certified True Copy

   Company rubber stamp to be affixed

   [Notes:

1. This certified true copy should be submitted on the letterhead of the Company, signed by the Company Secretary or any Whole Time Director/ Manager (supported by a specific board resolution) of the SoleBidder or the Lead Member of Consortium.
2. The contents of the format may be suitably re-worded indicating the identity of the entity passing the resolution, i.e., the SoleBidder, each Member of the Bidding Consortium. Further, in case of an AIF, an undertaking by the competent authority, based on delegation of authority accorded by the Fund/ board resolution of its investment manager can be submitted.
3. This format may be modified only to the limited extent required to comply with the local regulations and laws applicable to a foreign entity submitting this resolution. For example, reference to Companies Act 1956 / Companies Act 2013 (as the case may be) may be suitably modified to refer to the law applicable to the entity submitting the resolution. However, in such case, the foreign entity shall submit an unqualified opinion issued by the legal counsel of such foreign entity, stating that the Board resolutions are incompliance with the applicable laws of the respective jurisdictions of the issuing company and the authorizations granted therein are true and valid.]
4. If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from submitting this form (Form 19 of Section 4).

Format 2

Format for the Board resolution of Technically / Financially Evaluated Entity / Ultimate Parent Company (in case credentials of such TEE/ FEE has been utilized by the Sole Bidder or Bidding Consortium)

The Bard, after discussion, at the duly convened Meeting on …….. [Insert date] with the consent of all the Directors present and in compliance of the provisions of the Companies Act, 1956 2013. passed the following Resolution:

RESOLVED THAT pursuant to the provisions of the Companies Act, 1956 / Companies Act, 2013 (as the case may be) and compliance thereof and as permitted under the Memorandum and Articles of Association of the company, approval of the Board be and is hereby accorded for issuing an Undertaking to the Utility, in the format specified in the RFP issued by the Utility, draft of which is attached hereto and initiated by the Chairman whereby the company undertakes to invest …….. percent (……%) of the total equity share capital of the SPV representing the entire amount proposed to be invested by …….. [insert name of the Bidder or Member] for the said Project, in case of failure of ……. [Insert the name of the Bidder or Member] to make such investment".

FURTHER RESOLVED THAT …….. be and is hereby authorized to take all the steps required to be taken by the Company, including in particular, signing the said Undertaking, submitting the same to the Utility through ……...[insert name of Sole Bidder / Lead Member of the Consortium] of all the related documents, certified copy of this

Board resolution or letter, undertakings etc. required to be submitted to Utility as part of the Bid or such other documents as may be necessary in this regard.

Certified True Copy

Company rubber stamp to be affixed

Note:

1. This certified true copy should be submitted on the letterhead of the Company, signed by the Company Secretary or any Whole-time Director/Manager (supported by a specific board resolution) of Sole Bidder or Lead Member of the Consortium.
2. The contents of the format may be suitably re-worded indicating the identity of the entity passing the resolution. Further, in case of an AIF, an undertaking by the competent authority, based on delegation of authority accorded by the Fund/ board resolution of its investment manager can be submitted.
3. This format may be modified only to the limited extent required to comply with the local regulations and laws applicable to a foreign entity submitting this resolution. For example, reference to Companies Act 1956 / Companies Act 2013 (as the case may be) may be suitably modified to refer to the law applicable to the entity submitting the resolution. However, in such case, the foreign entity shall submit an unqualified opinion issued by the legal counsel of such foreign entity, stating that the Board resolutions are in compliance with the applicable laws of the respective jurisdictions of the issuing company and the authorizations granted therein are true and valid.

Annexure: Illustration for Applicable Board Resolution Requirements Under Clause 15 of Section 3

<Please Note: The list is indicative only. This needs to be detailed out and customized by Utility basis project requirement. The quantity of smart meters to be installed should be based upon As-Is consumer database as well as projected load growth in the selected AMI Project Area during the Contract Period. Any variation in GST and or cess on the Items specifically mentioned above shall be on account of the Utility and not other items including hardware and software that may be necessary for putting the AMI system in place>

Table: Bill of Materials and Services for Smart Meters. To be filled by AMISP. The Total Quantity of Smart Meters and Lump sum payment amount to be defined by the Utility

Investor in the AMISP	Entities (other than Bidder) whose credentials (financial and/or technical) used by the Bidder for meeting RFP criteria	Applicable Board Resolutions	Requirement of Undertaking (Form 18)
Bidder himself for 100% equity Meter	None	a) Format I of Annexure 11- Resolution:1,2 and 4 from the Bidder	None
Bidder himself for 100% equity Meter	Affiliate and/or Parent Company and/or Ultimate Parent	a) Format I of Annexure 11 - Resolution: l, 2, and 4 from the Bidder b) Format 2 of Annexure ll by either Technically/ Financially Evaluated Entity (ies) whose credentials have been used, or Ultimate Parent. Provided. If the Bidder himself is the Ultimate Parent, then Format 2 need not be provided.	Yes, by either Technically / Financially Evaluated Entity (ies) Affiliate(s) whose credentials have been used, or Ultimate Parent. Provided, if the Bidder himself is the Ultimate Parent, then the undertaking need not be provided.

Investor in the AMISP	Entities (other than Bidder) whose credentials (financial and/or technical) used by the Bidder for meeting RFP criteria	Applicable Board Resolutions	Requirement of Undertaking (Form 18)
-Bidder himself + others (Affiliate and/or Parent Company and/or Ultimate Parent) in aggregate holding 100% equity	None	a) Format 1 of Annexure 11 - Resolution: 1, 2, 3 And 4 from the Bidder. b) Format I of Annexure 11 - Resolution: I from the Affiliate and /or Parent and /or Ultimate Parent investing in the equity	None
Bidder himself + Others (Affiliate and/or Parent Company and/or Ultimate Parent) in aggregate holding 100% equity	Affiliate and/or Parent Company and/or Ultimate Parent	a) Format 1 of Annexure 11 - Resolution: 1,2, 3 and 4 from the Bidder. b) Format I of Annexure 11 - Resolution: I from the Affiliate and/or Parent and/or Ultimate Parent investing in the equity c) Format 2 of Annexure 11 by either Parent / Affiliate(s) whose credentials have been used and /or Ultimate Parent investing in the equity	Yes, by either Parent/ Affiliate(s) whose credentials have been used, or Ultimate Parent

Form 20: Pre-Contract Integrity Pact

[To be on non-judicial stamp paper of Rupees Five Hundred Only (INR 500/-) . Foreign companies submitting Bids are required to follow the applicable law in their country.]

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on day of the month of 2021, between, on one hand, the ……. (Name of Owner) acting through Shri…… (Name and designation of Project Manager) (hereinafter called the "BUYER", which expression shall mean and include, unless *the* context otherwise requires, his successors in office and assigns) of the First Part and M/s…… (Name of Bidder) represented by Shri , Chief Executive Officer (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a PSU/Utility/Department of State Govt. performing its functions on behalf of the …… (Name of owner).

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The BUYER will, during the pre-contract stage, treat all BIDDERs alike and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach

2.0 In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERs

3.0 The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following: -

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or for bearing to show favour or disfavour to any person in relation to the contract or any other contract with Government.

3.3 BIDDERs shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4 BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5 The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially 'or unofficially to the award of the contract to the BIDDER, nor has any amount

been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. **Previous Transgression**

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER’s exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be

disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit)

5.1 While submitting commercial bid, the BIDDER shall deposit an amount……. (to be specified in RFP) as Earnest Money/Security Deposit, with the BUYER through any of the following instruments:

(i) To be paid online

(ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in the RFP).

5.2 The Earnest Money/Security Deposit shall be valid upto a period of ….. years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the' Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions wherever required:

(i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason, therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India,

while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the UBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss 'or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER

(vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this Pact also on the Commission by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Deleted

8. <u>Independent Monitors</u>

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors to be given).

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at ……on……

BUYER	BIDDER
Name of the Officer	XXXX
Designation	

Witness	Witness
1……..	2…….
2…….	3……..

* Provisions of these clauses would need to be amended/ deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers

Form 21: Data Requirement Sheet

Please Note: In case of any deviation of minimum requirement of features (listed below) from the existing BIS standards, the existing BIS standards shall prevail over the same; in addition to the below requirement, the AMISP has to adhere to the technical specifications mentioned in this RfP.

Routers for RF Mesh Network (If Applicable)

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering
1.	**General Requirements**	• The communication network shall have dynamic & self-healing capability. If one of the communication elements such as router or access point fails, then nodes connecting to that element shall switch to best available element for communication of data to HES. • It shall support IPv6 network addressing. • Each node shall keep a track of best available nearby nodes. • The communication network equipment shall use Unlicensed or Licensed frequency band as permitted by WPC/Statutory Bodies in India. • Suitable network management system (NMS) shall be available to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration, parameterization of the networking devices and the nodes. • It shall support remote firmware upgrading as per IS 16444 • It shall be secure enough to avoid all cyber threats such as DDoS, spoofing, malwares etc. • The communication network shall ensure secure communication of data to HES. • The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP-65). A suitable mounting provision shall be made for the equipment. • Enclosure: Provision for security sealing shall be provided and in case the gasket of the cover is used for protection against moisture, dust and insects, the gasket shall be made of weather and aging resistant material.	

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering
		• The list of standards followed in all the devices/equipment used in communication network shall be furnished. •	

Access Points for Communication Networks (Access point/Gateway/Routers) (if Applicable)

S.No.	DescriptionoftheFeatures	MinimumRequirementofFeatures	AsperBidderOffering
1.	**Configuration Requirement**	• It shall be able to configure the communication with underlying nodes/end points. • It shall support on demand read and ping of individual/group of meters. • It shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters. • It shall have Wide Area Network (WAN) connectivity to the HES through suitable means. • It shall communicate with routers/nodes/end points on RF / RF mesh (Unlicensed or Licensed frequency band as permitted by WPC/Statutory Bodies in country of deployment as applicable). • It shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads. • After power Interruption, on restoration of power supply, it shall establish communication with underlying devices as well as upstream application (HES) automatically. • Access point shall facilitate recording of: o No of packet failures o Retry attempts o Missed periodic reading o Failure to connect o Tamper events	

S.No.	DescriptionoftheFeatures	MinimumRequirementofFeatures	AsperBidderOffering
		• It shall be capable to handle interval data of suitable nos. of any type of Smart Meter (1ph/3ph/HT). Access point shall be able to acquire and send data to HES for full capacity (No. of meters/field devices it is designed for) within a suitable time period to achieve the performance level. Full capacity of access point is required to be indicated in the offer. • Access point shall support remote firmware upgrades as well as remote configuration from the Network Operation cum Monitoring Center.	

Data Concentrator Unit (DCU) (If Applicable)

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering
1.	**Configuration, Functionality & Interface**	• It shall be able to configure the communication with underlying nodes/meters. • It shall pull data from the field devices and push the data at configured intervals to the HES. It should also support the HES in pulling data from the field devises/meters. The data acquisition (Push/Pull) frequency shall be programmable. DCU shall be capable to prioritize control commands. • DCU shall ensure a secure communication to HES and shall have internal memory for storing interval data for at least 5 (five) days. • DCU shall support on demand read and ping of individual/group of meters. • It shall support IPv6 network addressing. • DCU shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters. • The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP-65). A suitable mounting provision shall be made for the equipment.	

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering
		• Enclosure: Provision for security sealing shall be provided and in case the gasket of the cover is used for protection against moisture, dust and insects, the gasket shall be made of weather and aging resistant material.	
2.	**Communication**	• The communication architecture shall be any, as defined under IS 16444. • The DCU shall ensure the appropriate backhaul for secure transfer of data to HES either via cellular or Fiber Optic communication. In case of cellular backhaul, it shall support dual SIM card with dynamic IP from any Implementing Agency. It shall have Wide Area Network (WAN) connectivity to the HES through suitable means. • DCU shall be able to communicate with meters either on RF / RF mesh (Unlicensed or Licensed frequency band as permitted by WPC/Statutory Bodies in country of deployment as applicable) . • DCU shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads. • It shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters. DCU shall be able to acquire and send data to HES for full capacity (as per designed for no. of meters/field devices) to ensure the performance level. Full capacity of DCU is required to be indicated in the offer. • After Power Interruption, on restoration of power supply, DCU shall establish communication with underlying devices as well as upstream application automatically. • DCU shall be able to communicate with the nearest meters depending on topographical features. For further communication among the meters, distance of the other meters with the DCU shall not be a constraint as communication of the nearest meters shall be established with other meters through	

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering
		appropriate mesh formation / other formation. • Remote Firmware Upgrade: The DCU shall support remote firmware upgrades as well as remote configuration from the network operation cum monitoring center. Configuration of programmable parameters of Smart Meters shall be done through HES. • All meters falling under one DCU shall be commissioned and checked for proper communication in presence of Utility in-charge. • DCU shall keep the records of minimum of the following events: o No of packet failures o Retry attempts o Missed periodic readings o Failure to connect o Tamper events	

Head-End System (HES) *<Utility to provide minimum requirements as applicable>*

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering

Firewall and Intrusion Protection System According to MEITY Guideline and NCIIPC (National Critical Information Infrastructure Protection)

.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering

Internet Router According to MEITY Guideline and NCIIPC (National Critical Information Infrastructure Protection)

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering

Local Area Network According to MEITY Guideline and NCIIPC (National Critical Information Infrastructure Protection)

S.No.	Description of the Features	Minimum Requirement of Features	As per Bidder Offering

Form 22: Manufacturer Authorisation Form (MAF)

(On Letterhead of each OEM)

To: [Insert: Name of Utility]

Dear Sir/Ma'am,

We [insert: name of Manufacturer] who are established and reputable manufacturers of [insert: name and/or description of the plant & equipment] having production facilities at [insert: address of factory] do hereby authorize [insert: name & address of Bidder] (hereinafter, the "Bidder") to submit a bid, and subsequently negotiate and sign the Contract with you against [insert: title and reference number of Invitation for Bids] including the above goods and services.

We hereby extend our full guarantee and warranty for the above specified plant & equipment materials or other goods offered supporting the supply, installation, commissioning and achieving of Operational Go-live of the plant by the Bidder against these Bidding Documents, and duly authorize said Bidder to act on our behalf in fulfilling these guarantee and warranty obligations. We also hereby declare that we and ……, [insert: name of the Bidder] have entered into a formal relationship in which, during the duration of the Contract (including warranty / defects liability) we, the Manufacturer or Producer, will make our technical and engineering staff fully available to the technical and engineering staff of the successful Bidder to assist that Bidder, on a reasonable and best effort basis, in the performance of all its obligations to the Purchaser under the Contract.

For and on behalf of [insert: name of Manufacturer]

Signed: _____

Date: _____

In the capacity of [insert: title of position or other appropriate designation] and this should be signed by a person having the power of attorney to legal bind the manufacturer.

Date:.....

Place:..... (Signature).....….....……..

(Printed Name).....…….

(Designation).....…….....

(Common Seal).…….....…..….....

Note:

1. The letter of Undertaking should be on the letterhead of the Manufacturer and should be signed by a person competent and having Power of Attorney to legally bind the Manufacturer. It shall be included by the Bidder in its bid.

2. Above undertaking shall be registered or notarized so as to be legally enforceable.

Form 23: Format of Agreement to be entered by sub-contractors with the sole bidder / lead member 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 AGREEMENT BETWEEN
M/s…....., AND M/s. ..... for bidding for Tender No. [Tender Details] (the "RFP") dated [Date]

1. **THIS Agreement** (hereinafter referred to as "Agreement") executed on this ..... *[date]* day of ..... *[month]*, ... *[year]* between
2. M/s. ....., a company incorporated under the laws of ..... and having its Registered Office at ....., (hereinafter called "**Party 1**," or "**Lead Consortium Member**" or "**Sole Bidder**" 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 "**Party 2**," or "**Sub-contractor**" which expression shall include its successors, executors and permitted assigns);

[The Sub-contractor should list the name, address of its registered office and other details above.]

WHEREAS the Parties abovenamed are entering into this Agreement for the purpose of submitting the Bid in response to the RFP and in the event of selection as Selected Bidder to comply with the requirements as specified in the RFP and ensure execution of the AMISP Contract as may be required to be entered into with Utility.

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

WHEREAS the RFP stipulates that the sub-contractors shall submit a legally enforceable Agreement in a format specified in the RFP, whereby each sub-contractor undertakes to be liable for its Roles and Responsibilities, provide necessary guarantees and pay required fees as required as per the provisions of the RFP, as specified herein.
WHEREAS any capitalized term in this Agreement shall have the meaning ascribed to such term in the RFP document.

NOW THEREFORE, THIS AGREEMENT WITNESSTH AS UNDER:
In consideration of the above premises and agreement all the Parties in this Consortium do hereby mutually agree as follows:

17. In consideration of the selection of the bidder by the Utility, we as the sub-contractor to the sole bidder/ lead member of the bidding Consortium and Party to this Agreement do hereby unequivocally agree that M/s..... *[Insert name of the Sole bidder/ Lead Member of the bidding consortium]*, shall act as the Lead Member as defined in the RFP for self and agent for and on behalf of M/s. ....., *[the name of the sub-contractor to be filled in here]*.

18. The Roles and Responsibilities of the sub-contractor shall be as per the **Annexure** to this Agreement.

19. The sub-contractor 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 RFP. The Sole bidder/ Lead Consortium Member shall be liable and responsible for ensuring the individual and collective commitment of the sub-contractor in discharging their respective Roles and Responsibilities.

20. In case of any breach of any of the commitment as specified under this Agreement by the sub-contractor, the Sole bidder/ Lead Consortium Member shall be liable to meet the obligations as defined under the RFP.

21. 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 Sole bidder/ Lead Consortium Member under these presents.

22. The Members expressly agree to adhere to all the terms and conditions of the RFP and confirm that we don't have any Conflict of Interest (as defined in the RFP).

23. This Agreement shall be construed and interpreted in accordance with the Laws of India and Courts at [Place] shall have the exclusive jurisdiction in all matters relating thereto and arising there under.

24. It is further expressly agreed that the Agreement shall be irrevocable and, for the AMISP, shall remain valid over the term of the Project, unless expressly agreed to the contrary by Utility.

25. The Sole bidder/ Lead Consortium Member is authorized and shall be fully responsible for the accuracy and veracity of the representations and information submitted by the Sub-contractor respectively from time to time in response to the RFP for the purposes of the Bid. The representation by the Sole bidder/ Lead Consortium Member shall be deemed to be on behalf of and binding on the sub-contractor.

26. It is expressly understood and agreed between the Sole bidder/ lead consortium member and the sub-contractor that the responsibilities and obligations of each of the Members shall be as delineated as annexed hereto as Annexure-A 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 RFP Documents.

27. It is clearly agreed that the Sole Bidder/ Lead Consortium Member shall ensure performance indicated in the RFP. In the event the sub-contractor fails to perform its/ their respective obligations, the same shall be deemed to be a default by the Sole Bidder/ Lead Consortium Member.

28. It is hereby expressly agreed between the Parties to this 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 Utility.

29. This 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 Utility.

Common Seal of ..... has been affixed in my/ our presence pursuant to Board Resolution dated	For M/s. ..... (Party 1) *[Signature of Authorized Representative]* ..... *[Name of the Authorized Representative]* *[Designation of the Authorized Representative]*

Witness 1

[Signature of Witness 1]
.....
Name:

Designation Witness 2 [Signature of Witness 2] ..... Name: Designation:	
..	
N. Common Seal of ..... has been affixed in my/ our presence pursuant to Board Resolution dated	For M/s. ..... (Party 2) *[Signature of Authorized Representative]* ..... *[Name of the Authorized Representative]* *[Designation of the Authorized Representative]*
N.1. Witness 1 [Signature of Witness 1] ..... Name: Designation:	N.2. Witness 2 [Signature of Witness 1] ..... Name: Designation:

Annexure-A

Role and Responsibility of each Member of the Consortium:

1. Roles and Responsibilities of the Party 1 (Sole Bidder/ Lead Consortium Member):
2. Roles and Responsibilities of the Party 2 (Sub-contractor)

Form 23: DECLARATION/UNDERTAKING

(Appendix to Technical Part of the Bid)

DECLARATION/UNDERTAKING

(To be on 100/- Rs. non judicial stamp duly Notarized)

I/We hereby undertakes that I/We have not altered/deleted/added any term & conditions, technical specification & Guaranteed Technical Particular of Materials/equipments, etc. Incorporated in the RDSS tender specifications (TS-……..) uploaded by [NAME OF DISCOM] on the MP tender portal https://mptenders.gov.in.

I/We further undertakes that during the process of evaluation (or later on during execution) if, any altered/deviation/addition is observed in our submitted offer (with respect to uploaded tender document), the [NAME OF DISCOM] will have full rights to reject our submitted offer and may take the action as deemed fit in accordance with the terms & conditions of the tender specification

Dated the ……. *[Insert date of the month]* day of ……. *[Insert month, year]* at ……. *[Insert place]*.

_____

Signature {(of Bidder's authorized Bid Signatory (ies)}[#] {In full and initials}:

Full name: {insert full name of authorized Bid Signatory}
Title: {insert title/position of authorized Bid Signatory}
Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):
Capacity: {insert the person's capacity to sign for the Bidder}
Address: {insert the authorized Bid Signatory's address}
Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}
Email: {insert the authorized Bid Signatory's email address}_____

[#]{*For a joint venture, or only the authorised signatory, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}*

Section 5. Financial Proposal - Forms

Sr.	Document	Attached (Yes/ No)	For Official Use
1	Financial Bid as per format provided in Form 1		

Form 1: Format of Submission of Financial Bid (For Reference Only)

[IMPORTANT NOTE: THE FINANCIAL BID SHALL ONLY BE SUBMITTED IN THE ELECTRONIC FORMAT. IT SHALL NOT BE SUBMITTED IN HARD COPY OR AS A PART OF THE TECHNICAL BID.]

[On the letter head of each Member of the Consortium including Lead Member/ Sole Bidder]

[Reference No.]

From:
[Address of the Lead Consortium Member/ Sole Bidder]
[Telephone No., Fax No., Email]
[Date]

To:
[Utility]
[Address]

Sub: Financial Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis.
Ref: [Tender Details]

Dear Sir/ Madam,

We, the undersigned ….....…. [Insert name of the Lead Consortium Member/ Sole Bidder 'Party 1'] representing ….....…. [Insert name of the Lead Consortium Member 'Party 2'], ….....…. [Insert name of the Lead Consortium Member 'Party 3'], ..., and ….....…. [Insert name of the Lead Consortium Member 'Party n'], having read, examined and understood in detail the RFP for Implementation of [Utility]'s AMI hereby submit our Financial Bid. We hereby undertake and confirm that:

A. We have submitted our Financial Bid strictly in accordance with the RFP without any deviations or condition.

B. Our Financial Bid is consistent with all the requirements of submission as stated in the RFP and subsequent communications.

C. Price quoted clearly mentions the total cost (basic cost, Goods and Services Tax, or any other taxes/duties/levies).

D. Under no circumstances shall escalation in prices of this Financial Bid be entertained by Utility except due to factors mentioned in Clause 5.3.3. of Section 7.

E. The details quoted herein shall stand valid at least for 6 months from the date of submission of this Financial Bid and for implementation of Project, if awarded, as per the timeframe indicated in the RFP.

F. Our Total Cost of the Project for the contract period is INR……; and the quoted AMISP Service Chargewill be a fixed for the entire contract duration

G. Our quoted prices are as per the Annexure attached herein.

Dated the ……. [Insert date of the month] day of ……. [Insert month, year] at ……. [Insert place].

Thanking you,

Sincerely yours,

[Insert Signature here]
[Insert Name here]
[Insert Designation here]

Annexure: Quoted prices for the Financial Bid.

<Please Note: The list is indicative only. This needs to be detailed out and customized by Utility basis project requirement. The quantity of smart meters to be installed should be based upon As-Is consumer database as well as projected load growth in the selected AMI Project Area during the Contract Period. Any variation in GST and or cess on the Items specifically mentioned above shall be on account of the Utility and not other items including hardware and software that may be necessary for putting the AMI system in place>

Section A: Bill of Materials and Services for Smart Meters. To be filled by AMISP. The Total Quantity of Smart Meters and Lumpsum payment amount to be defined by the Utility

S. No/.	Item Description (A)	Quantity in Nos. (B)	Rate per Unit including all taxes and duties other than GST (in INR/ month/ meter) (C)	GST applicable in % (D)	AMISP Service Charge (in INR/ month/ meter) (E = C x	Lumpsum payment per Unit (in INR/ meter) (F)	Total cost for each category of meter (G = BX ((E X 93 months) +F))
1.	**Meters (each with related meter box, hardware, software and equipment)**						
1.1	Single phase whole current Smart Meter) – Consumer Meter with Meter Box, Back-end IT Infra with associated works and requisite no. of polycarbonate seal.	1099875				900	
1.2	Three Phase whole current Smart Meter – Consumer Meter with Meter Box and Back-end IT Infra with associated works and requisite no. of polycarbonate seal	56735				900	
1.3	Three phase LT-CT operated Smart Meter – Consumer Meter with CTs, control cables, without DI provisions Meter Box and Back-end IT Infra with associated works and requisite no. of polycarbonate seal.	1158				900	
1.4	Three phase CT/PT operated Smart Meter – HT Consumer, control cables, and Backend IT Infra with associated works and requisite no. of polycarbonate seal	100				900	
	Total	**1157868**					

Total Cost of the Project (*Total of Column G in table above*) = **INR [X] crores**

Section 6. Project Requirements

AMI System Requirements and Service Level Agreement

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1. Overview of the AMISP Scope of Work

1.1 "Advance Metering Infrastructure Service Provider (AMISP)" or the "AMISP" shall Design, Build, Finance, Own, Operate, Transfer (DBFOOT) the Advance Metering Infrastructure (AMI) Project in the pre-paid (by default) mode in selected AMI Project Area. The AMISP shall finance and implement the project including **end-to-end Smart Prepaid Metering**, operate for 'Total Meter-months' as defined in this Contract and thereafter transfer the ownership of the entire system including all the hardware, software along with its valid licenses, and any data collected during the Project to the Utility at the end of the Contract Period to facilitate seamless operation of Utility businesses. Utility shall make payments to the AMISP in accordance with the terms and conditions of this Contract.

1.2 The AMI Project Area

The AMI Project shall be implemented in the Project Area comprising of:
(A) Contiguous electrical locations (which will be ring fenced with boundary meters) where all Consumers, shall be smart metered to enable complete energy accounting with zero Manual intervention
(B) Non-contiguous electrical locations where dispersed metering for certain Industrial, Commercial and Government consumers and

Profile of Project area. The tentative key details include following:

S. N.	Circle	Total (LT/HT)
1	Agar	74343
2	Dewas	191723
3	Mandsaur	210934
4	Neemuch	110829
5	Ratlam	202533
6	Shajapur	116349
7	Ujjain	251157
Ujjain Region Total		**1157868**

The Circle wise details of consumers where Smart Prepaid Metering to be implemented will only be finalized after survey from AMISP and approved by Discom

1.3 The AMI system should be designed such that all the required hardware, software, and firmware with upgrades satisfy the AMI system requirements and service level agreements as specified in this Contract while considering technical obsolescence over the operating life of the system and suitability for future scale up. AMISP is free to decide upon the best solution out of all the available options. However, the entire responsibility of fully functional AMI system shall rest with the AMISP in order to meet the performance levels as given in the Contract. The AMISP shall ensure that the Solution complies with the Applicable Law, technical specifications and other provisions of the Contract.

1.4 Brief Scope of Work:

The Scope of work of AMISP shall include site survey, planning, designing, financing, engineering, manufacturing, supply, transportation & insurance, delivery at site, unloading, handling, storage, installation, integration, testing, commissioning, demonstration for acceptance, training, maintenance, operation and documentation of various AMISP components given below:

A. Supply, installation, integration, testing and commissioning of:
   a. Smart pre-paid metering along with Smart meter box installation through 1-Ph, 3-Ph , HT Meter and LT CT along with accessories such as M-Seal, Tapes, Lugs and Glands as per Clause 2.1 of this Section.
   b. Communication Infrastructure to ensure the performance levels provided in this Contract as per Clause 2.2 of this Section;
   c. Head End System (HES) and deployment on cloud as per Clause 2.3 of this Section;
   d. Meter Data Management system (MDM) with prepaid functionality (as a part of MDM or through a separate pre-payment application) and deployment on cloud as per Clause 2.4 of this Section;
   e. Consumer portal and mobile application as per Clause 2.5 of this Section;
   f. Network Operation cum Monitoring Centre (NOMC) with suitable backend communication infrastructure, hardware and power supply as per Clause 2.6 of this Section;
   g. All other necessary software along with valid licenses relevant to the Project (as per Clause 2.7 of this Section);
   h. Installation of LTCT meters to LTDB/Fuse Box, wherever applicable. Material, tools and other accessories (not covered in BoQ) required for dismantling, civil work and installation of the new meter, shall also be in the scope of AMISP. Further the Existing service cable & meter board shall be utilized by the AMISP for installation of Meters and in case of damaged service cable/Board or new connections, the service cable/ meter board shall be provided and installed by the Utility/consumer if required as per assessment of the Discom. Other items such as Lugs & Fasteners etc. need to be arranged by the AMISP

   i. In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).

j. In future, Discom is also planning to develop their new Central Repository System which will be owned by Discom, it is also responsibility of AMISP to provide necessary integration and connectivity upto Central Repository System.

k. The AMISP shall use the alternate SIM cards from minimum 2 Service providers for data transfer from DCU / Router / Gateway to HES and shall bear the recurring charges for 4G/5G SIMs / MPLS connectivity / Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide 2 different telecom service provider SIMs

l. CMRI (Common Meter Reading Instrument)/ Mobile App will be used for meter reading and will be checked with the data generated at the HES side

m. For every 50,000 meters, one workstation console needs to be provided by AMISP. For every 50,000 meters, one workstation console (Including Desktop, Office Table, Chair and 2 visitor Chairs) needs to be provided by AMISP will be provided extra as the material related to NOMC. The clause related to deployment of PCs at Corporate and Circle level will also remain the same.

n. The AMISP has to provide Smart Meters with ToDs (Import & Export) in their Display Parameters, ToD (Import & Export) values in Daily profile & Billing data of Head-End-System (HES).
Further, AMISP has to make provisions in the Mobile Application for replacement of Old legacy meter to Smart Meters wherein ToD (Import & Export) wise Start Reading along with CKWH shall be available in their aforesaid App.

~~o. Installation of 12x1; single phase as well as three phase- 3x1, 5x1, 9x1 Cabinet boxes with requisite cabling wherever applicable.~~

B. AMI System integration as per Clause 3 of this Section;

C. Consumer indexing on de-novo basis for (wherever applicable)
i. Contiguous electrical locations as mentioned in Clause 1.2 (A) in the selected AMI Project
Area along with its regular updates during contract period as per Clause 4 of this Section.
ii. Non-contiguous electrical locations as mentioned in Clause 1.2 (C), i.e., Consumer indexing with DTs on de-novo basis along with its regular updates during contract period as per Clause 4 of this Section; and feeder to DT indexing on de-novo basis for all DTs in along with its regular updates during contract period as per Clause 4 of this Section."

D. Development of a comprehensive consumer engagement plan (as per Clause 5 of this Section) related to different stages of implementation (Pre, during and post installation phases of Smart Prepaid Metering) in consultation with utility and implement its part of its activities as per the developed plan. The plan at the minimum should include consumer engagement activities to be undertaken at Utility's headquarter, division and sub-division level as well as communication and media plan;

E. Generation of automated energy audit reports (DT level/ Feeder level / Sub-division level/ Division level/ Circle) in contiguous electrical locations and other reports as per Clause 6 of this Section; (If applicable)

F. Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system as per Clause 7 of this Section;

G. Training of Utility personnel, as required for efficient, viable and fully functional system as per Clause 8 of this Section.

H. Other activities to be carried out to ensure successful installation and commissioning:

   a. Dismantling of existing meter boxes and meter boxes along with necessary items like CT'S, lugs etc. as per the guidelines of the Utility. The installation work of meter boxes, etc. should be carried out as per the safety guidelines of the Utility, while meeting all requisite quality standards.
   b. All meter installations at user accessible height. The above may be reviewed on case-to-case basis with inputs from the Utility.
   c. All the associated necessary civil work for dismantling existing structures / equipment and to put in place the new structures / equipment, shall be carried by the AMISP.

I. The AMISP shall establish temporary Material Handling Points (MHPs) at suitable rural clusters, division offices, or nearby substations to ensure uninterrupted and efficient supply of smart meters, service cables, and associated installation accessories.
   The AMISP shall ensure adequate manpower, storage arrangements, transportation facilities, and record-keeping mechanisms at each Material Handling Point for safe handling, accounting, and distribution of materials. All materials stored shall be properly tagged, protected from environmental exposure, and maintained as per manufacturer's guidelines.
   The Discom reserves the right to inspect such facilities at any time to verify the availability, quality, and handling procedures of materials.

1.5 Guidelines for testing, inspection, approval of test records and in general, management of the Quality Assurance / Quality Control program of the AMI project as given in Clause 9 of this Section shall be generally adhered to.

1.6 Guidelines for project management as given in Clause 10 shall generally be adhered to.

1.7 The AMISP shall be required to submit project documentation describing the system operations for information/ approval as per Clause 11 to the Utility.

1.8 Unless otherwise stipulated in the RfP or Contract, the scope of work shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for comprehensive, successful and satisfactory implementation of the Solution as if such items were expressly mentioned in the Contract. The same may be mutually enlisted and agreed upon by Utility and AMISP during the design phase as defined in the Contract;

1.9 Wherever references are made in the RfP to codes and standards in accordance with which the Solution shall be executed, the edition or the revised version of such codes and standards shall be those specified in the scope of work;

1.10 The systems which are at a risk of technical obsolescence over the operating life of the system should be identified; this should include end-of-sale and end-of-support policies governing the proposed technologies. Forward and backward compatibility need to be considered and mitigation option shall be indicated in detail and shall not be limited to periodic update from OEM/System supplier.

1.11 Exclusion from Scope of Work: Following shall be excluded from AMISP's scope of work

a. Construction of building for AMI Network Operation cum Monitoring Centre;
b. Lighting system for AMI Network Operation cum Monitoring Centre;
c. Interior and Integrated Building Management System (IBMS) of building for AMI Network Operation cum Monitoring Centre;
d. Air conditioning and ventilation for AMI Network Operation cum Monitoring Centre;
e. Firefighting system for AMI Network Operation cum Monitoring Centre;
f. A.C. input power and back-up supply for AMI Network Operation cum Monitoring Centre;
g. Any modifications required in the existing system of the Utility (Billing, Website, etc.).

1.12 Responsibilities of the Utility

The Project Director (Smart Meter) shall act as the nodal point for the implementation of the Contract and for issuing necessary instructions, approvals, commissioning, acceptance certificates, payments etc. to the AMISP.

The Utility shall:

a) Whenever implementation of any component of the Solution requires that the AMISP obtain permits, approvals, and import and other licenses from local public authorities, if

so required by the AMISP, make its best effort to assist the AMISP in complying with such requirements in a timely and expeditious manner;

b) Erection of requisite structure for installation of boundary meters and corresponding ring-fencing of Project Area
c) approve all such documents required for completion of Pre-Operational Go-Live Phase, in accordance with Clause 11 of this Section, within 15 (fifteen) working days from the date of submission of such documents;
d) Provide on AMISP's request, particulars/ information / or documentation that may be required by the AMISP within 30 (thirty) days from date of execution of the Contract to enable preparation of the Project Implementation plan by the AMISP;
e) Provide existing database of consumer indexing and physical & IT infrastructure as available with the Utility. Utility shall provide all required data to the AMISP to identify all the consumers connected on the identified sub-stations, feeder lines and transformers of the AMISP Project area;
f) Review and approval of AMISP's Project Implementation Plan;
g) Provide drawings for NOMC building where AMI system installations are planned;
h) Provide necessary inputs for developing a comprehensive consumer engagement plan;
i) Provide necessary approvals for shutdowns as required for implementing the AMI System;
j) Dismantling of old meters and associated accessories and return of dismantled materials to Zone offices/ Area stores.

k) Implement consumer engagement plan with support of AMISP. This would include running media campaign to raise awareness and countering myths around Smart Prepaid Metering prior to installation, providing SOPs for smart meter installation to AMISP, etc.
l) Keep AMISP informed of any changes in the area network during the project installation and operation period. Furthermore, Utility will partner with AMISP for discovering/ updating consumer indexing (DT/ Feeder wise) after installation of smart meters through structured power events data analysis including scheduling such events for each node with minimum inconvenience to consumer
m) Provide A.C. power supply inputs
n) Provide all required documents for delivery of material at site
o) Provide at its expense, the electrical energy required for performance of the Project activities, installation, testing, and operation of the AMI Systems
p) Providing support and access to facilities at the sites, including consumer premises
q) Arrange for necessary shutdowns and work permits
r) Implement major civil works such as expansions or construction of rooms, trenches etc. as required for the AMI equipment
s) Ensure that sites for installation for Smart Meters are ready along with service cable including electrical neutral connectivity to the transformer, wherever applicable, for AMISP;
t) Provide the required integration interface details of the existing billing enterprise and related information required for Operational Go-Live of the AMI system, within 6 (six) months from date of execution of the Contract

u) Provide necessary clearance/ approval/ permits that are to be issued by it for initial 20% of contiguous electrical (If applicable) locations for Smart Meter deployment along with related documentation within 6 (six) months from date of execution of this Contract. Provide necessary clearance/ approval/ permits to be issued by it for remaining contiguous electrical locations as well as non-contiguous electrical locations for Smart Meter deployment along with related documentation on quarterly basis. Utility shall endeavor to provide 20% of contiguous electrical locations (If applicable) cleared each quarter and complete area within 18 (eighteen) months from date of execution of the Contract. Utility shall issue a Notice (provided if the Utility has not been able to provide clearance/ approval/ permits for installation of the meters) no later than 7 days of expiry of time period specified above confirming the actual number of meters for which clearance/ approval/ permits is available

v) Review the specifications of the Goods proposed to be used to ensure compliance with the provisions of this Contract.

w) Provide reasonable support to the AMISP for the Operational Go-Live in terms of the provisions of this Contract

x) Provide necessary support to AMISP in the Project area, in relation to (amongst others) access to Utility's/consumers premises, installation of AMI system, repair and maintenance services, etc. Utility shall also:

   i. Give access to AMISP supervisor or its operation & maintenance staff to work in the Project area during the Contract Period;
   ii. Provide an office space for AMISP personnel as mentioned in Clause 10 of this Section document within the Utility premises.
   iii. Give access to AMISP to use existing power and water supply, and other necessary equipment, as mutually agreed with the AMISP;
   iv. Not move, remove, modify, alter, or change the AMI system or any part thereof in the boundary of the AMI system installed by the AMISP without the prior written consent of AMISP. Utility shall take all reasonable steps to protect the AMI system from damage or injury and shall follow procedure for emergency action provided in advance by AMISP

y) Participate in periodic review meetings as per the project governance structure, and shall support with the required interventions requested;

z) Be responsible for operation and maintenance of power supply system, and promptly attend to any break down including repair or replacement of any equipment used/needed for maintaining continuity of electricity supply for AMI system operation;

aa) Permit AMISP to perform the project activities during working hours, and also after working hours as necessary, to meet the requirements of Project Implementation Plan;

bb) Provide necessary support in creation of pre-payment infrastructure;

cc) Attend to any irregularity with respect to AMI system operation, the cause of which has been brought to its attention by the AMISP;

dd) Promptly notify the AMISP of any events or circumstances that could affect the Project outcomes, or the AMISP's Services and obligations under this Contract;

ee) Allow AMISP (and/or its implementation partner, investor(s), authorized agency) unfettered access to network operation cum monitoring centre. Such covered and enclosed space as required by AMISP shall be provided to it by Utility free of cost during the Contract Period;

ff) Cooperate with AMISP in arranging financing for the Project, including by signing any relevant documents (such as substitution Contract) and providing such approvals, no-objections and waivers as may be required by investors/lenders;

gg) Appoint and notify to AMISP of the names and contact details of the Utility representative and its dedicated staff for the Project, which would include:

i. An engineer-in-charge for the Project who shall render full support to AMISP for Service delivery during the Term of this Contract and shall coordinate for payment to AMISP;

ii. A nodal officer, Utility Project Manager, to co-ordinate with AMISP in relation to the Project.

hh) Maintain consumer expectations basis the consumer engagement plan;

ii) Certify Installation Milestone in accordance with the provisions of this Contract.

jj) Facilitate AMISP for the timely implementation of the AMI Project and for its successful operation and maintenance during the Contract Period

kk) Release payments to AMISP as per agreed terms

ll) At its own cost, replace or repair existing equipment (other than AMI systems), such as poles, cables including consumer service lines, and transformers etc. where necessary to make the AMI system operational and/ or safe from hazards and maintain in proper working condition all portions of all facilities that are not included in the AMISP's scope of maintenance

mm) Provide all other necessary support as may be required time to time.

nn) Review and approve the AMI infrastructure architecture proposed by the AMISP, ensuring its compliance with the security requirements outlined in this document

oo) Ensure process inter-lock, i.e., Utility shall ensure that:

a. Any new consumer added to the Utility database shall be routed through the AMI system to ensure accurate tagging/ indexing of consumers.

b. Any modifications/ new additions in the network assets of the Utility, e.g., O&M works that lead to new asset addition (DT/ Feeders etc.), segregation of existing assets (Feeder segregation, creating of dedicated feeders etc.) shall be routed through the AMI system and the Utility shall ensure that the said asset is reflected in the AMI system/ any Utility software.

1.13 Dismantling of existing meter boxes and along with necessary items like CT's, lugs etc. as per guidelines of the Utility. Agency shall carry out installation work of meter box etc. with proper safety guidelines issued by the Utility for work at height, work on-live etc. while also meeting all quality standards

1.14 All meter installations at user accessible height. The above may be reviewed on case-to-case basis with inputs from the Utility.

1.15 AMISP will be responsible to provide sufficient number of teams for installation activities as per work schedule targets to complete the work. Each Team should comprise of at least one technician along with a supervisor.

1.16 All the necessary civil work, due to dismantling the existing structure and to place new, shall be carried by the AMISP in a professional way.

1.17 +In order to properly carry out analysis of delay in execution of contract/project, it is imperative that a date wise record of various activities right from award of contract to completion of works/supply is meticulously and systematically maintained by concerned

departments in respect of areas under their responsibility. In line with the above, it shall be ensured by the concerned officer of the Utility, that the following details are maintained:

a) Detailed Engineering Records: These shall include receipt of drawings/design calculations/other technical details from the contractor and its approval by the Utility, Type tests, Approval of Sub-contractor/vendor involving QR etc. and intermediate relevant activity.
b) Quality Assurance and Inspection records: These shall include approval of sub-contractor of Non-QR items, approval of Quality plan of Different manufacturers, Inspection of material including issuance of MICC based on Inspection call received from Contractor etc.(Responsibility: Quality Assurance Team of Utility and AMISP)
c) Site Execution Records: Execution site shall ensure that hindrance register is maintained, and entries are made therein on daily basis. The hindrance register should record all the hindrances in scheduled progress of work, such as delay in release in fronts due to non-completion of work by another agency doing associated work, delay in supply of infrastructure, facilities by 'Owner' as per contract, delay in receipt of material, delay in deployment of trained/adequate manpower, non-availability of site engineer/project in charge of contractor etc, apart from the day-to-day delay. These records also shall be reviewed during the fortnightly review of the progress of work by the concerned Officer, Utility and corrective measures shall be taken. Moreover, the entries/records in the register will be used/referred while analysing LD cases/arbitration cases/other claims of the contractor.

2. Supply, installation, integration, testing and commissioning of:

2.1 Smart Meters

The AMISP shall supply, install, integrate and commission smart meters of different types, the estimated number of which is given in the Bill of Material, in the Project Area throughout the Contract Period. The Utility shall provide details of new locations, consumer premises, Distribution transformers, feeders, boundary locations, etc.in the Project Area, where meters are to be installed from time to time.

Single phase whole current Smart Meters shall comply with technical specifications as provided in Annexure – A, three phase whole current Single Smart Meters shall comply with technical specifications as provided in Annexure – B, three phase LT-CT operated smart meters shall comply with technical specifications as provided in Annexure – C, HT Meter shall comply with technical specifications as provided in Annexure – D
In case additional meter specification/ requirements (over and above BIS standards), Utility shall provide the same in Annexure M of this section.
The AMISP has to furnish valid BIS certification before the supply of meters.
After meter installation, details of consumer connections, such as consumer identification no., meter ID, its hardware & software configuration, name plate details, make, type i.e., 1 Phase or 3 Phase Whole Current or 3 Phase LTCT or HT Meters shall be updated in the system. The information would also be updated on the consumer portal and app for providing information to consumers.

Reference, the Smart Meter communication, it is envisaged that plug and play type communication modules shall be deployed in the smart meter, for any given communication technology. These modules shall be field-deployable, with corresponding communication interface modules being used in the DCU/Gateway or BTS of wide area network in accordance with the details provided in Annexure F. The General requirements for common

pluggable module for smart meters as per Annexure F envisage a universal interface and a particular size irrespective of the choice of communication technology that defines the dimensions of the communication slot as well as physical placement and location of connectors. The same shall be adopted in all smart meters mandatorily for deployment w.e.f. 1 Jan 2023 or one year after BIS certification, whichever is later, and BIS certification taken accordingly as per IS 16444 for the same. The Network Interface Card (NIC) / Communication Module should be integrated with at least 3 (three) makes of meters in India to enable the respective meters to seamlessly integrate with proposed HES and/or MDM thus enabling interoperability of the system. In future, it would be AMISP's responsibility to integrate new meter in consultation with Utility or facilitate integration of other application as per the approach paper submitted under the Project Implementation Plan.

2.2 Communication Infrastructure

The communication infrastructure should either be based on RF / RF mesh network / PLCC /cellular network or a combination of these. Communication network shall provide reliable medium for two-way communication between various nodes (Smart Meter, Gateway/Router/Access Point/ DCU (wherever applicable)) & HES. RF based network should use licensed / unlicensed frequency band as permitted by WPC. The engagement of network service provider would be in the scope of AMISP to meet the performance level as given in the document.

Meter data shall be routed / collected by field devices like Gateway/Router/Access Point, Data Concentrator Units (DCUs) wherever applicable given the communication technology used and transported to HES through WAN backhaul connectivity.

2.2.1 General Requirements

The AMISP shall design / hire reliable, interference free & robust communication network. It shall be effective for providing communication in terrain, topology & the consumer density of the project site.

During designing, suitable consideration shall be kept for future expansion as mentioned in Annexure-E. Before designing the communication network, the AMISP shall do the site survey and would provide the most efficient communication infrastructure.

The entire infrastructure & associated civil works required for installation & commissioning of equipment/devices such as DCUs, repeaters, routers & access points etc. shall be in the scope of AMISP.

The network Solution deployed by the AMISP should have disaster recovery mechanism in place. The redundancy mechanism of HES and MDM and their disaster recovery plan shall also be highlighted by the AMISP. AMISP shall satisfy itself through the operational testing of network as a whole and its element for reliability before starting operations and billing.

The quality of installation of the various equipment & power supply wiring to all field equipment shall be as per standards/ regulations/prevailing practices of the utility. The reasonable supply of electricity needed for operation and maintenance of entire AMI system shall be provided by the utility free of cost.

A suitable NMS shall be built to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration & parameterization of the networking devices and the nodes. In case of public network such as cellular, the web-based portal (for example Open Network

platform) should be provided to have the network view at location of installed devices. The portal shall have connectivity & subscription management.

A suitable digital platform (cloud-based application) and mobile apps could be provided to support field installation and capture field related activities and to manage the field operation & maintenance activity during the contract period. This platform shall manage project life cycle.

AMISP should provide Bluetooth enabled device externally on optical port along with mobile app for seamless data transmission (without manual intervention) from Meter to HES.

2.2.2 Network Management System (NMS)

The proposed NMS shall facilitate following activities:

a) Security Management to protect systems and network from unauthorized access, manage user access, authorizing rights and privileges.

b) Viewing of all network elements deployed in the field and administer configuration changes of the network devices and nodes through toolkits to automate the following tasks:

   i. Capture running configuration, capture start-up configuration, upload configuration

   ii. Compare configuration

   iii. Real-time or scheduled capture of device configurations

   iv. Store historical device configurations captured and enable comparison of current device configuration against a previously captured configuration

c) Security patch management of all applications shall be encrypted and signed.

d) Performance Management to monitor network performance as specified.

e) Fault Management to recognize, isolate, log and identify fault on network and connected nodes, devices.

The network management software shall be based on the latest secured version of SNMP v3. The NMS shall have a simple browser-based user interface to provide all the pertinent information about the system. The NMS shall not impact the availability and performance of AMI applications and shall load not more than 1% of network bandwidth and shall have secure communication.

The Network Management Software shall have following functionality:

a) It shall maintain performance & error statistics, and present this information via displays, periodic reports and on-demand reports.

b) Apart from real-time monitoring of critical network devices, the above information shall be collected and stored at user configurable periodicities i.e., 5 minutes to 60 minutes. The NMS shall be capable of storing the above data for a period of one (1) year at an interval of 5 minutes.

c) It shall maintain a graphical display for connectivity and status of peripheral devices. The monitored devices shall be configured to send SNMP notifications, and the graphical element representing the device shall change to a different colour depending on the severity of the notification received.

d) It shall issue alarms when error conditions occur.

e) The period over which the statistics are gathered shall be adjustable by the user and the accumulated statistics shall be reset at the start of each period.

f) The statistics shall be available for printout and display after each period and on demand during the period.

g) In case more than one technology of AMI (example PLCC and RF between Smart Meter & DCU) deployed in the field. It shall maintain statistics on the performance and availability of node being delivered per AMI technology.

2.2.2.1 NMS Requirements Specific to HES

The Network Management System (NMS) function within the HES shall manage communication network and its associated devices and monitor the performance of network. This module shall provide real time information about the IP network and its associated NAN/WAN modules in the field device/s.

a) NMS shall be able to collect parameters viz. terminal status, device status, next hop information, RF / PLC signal strength, Hardware/software version numbers, communication logs/events etc. For cellular WAN network, it shall be able to constantly monitor the meter WAN module for its connectivity and signal strength and quality

b) NMS function shall be able to perform ping & trace-route to an individual and a group of Nodes (NAN / WAN), Routers /Gateways / Access Point, DCU.

c) NMS function shall routinely check the logged in status of the end node / field device and its availability in the network for data exchange. In case of failure to get the 'alive' message from the end node/field device, it shall mark and notify the node as logged out. It shall be also possible to restart of a node (NAN/WAN) as well as trigger a hardware reset of the node.

d) NMS function should be able to collect and store monitoring profiles from End Points (NAN/WAN modules) and network devices for performance evaluation and troubleshooting purposes. Historical logs of monitored profiles shall be available analysis through standard reporting tool.

e) If GIS is enabled, then topology, location (lat./long) and status of all network nodes shall be visible on GIS map.

2.2.3 Network Protection & Security

The AMI Network shall have adequate cyber security measures not limited to the measures as described below. The network security would be extended to all the interfaces also.

Secure Access Controls: The system shall include mechanisms for defining and controlling user access to the applications environment. Best practices from enterprise

security including password strength, password aging, password history, reuse prevention etc. must be followed for access control.

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.

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 with the least-privilege concept mentioned above, so that entries may not be deleted, accidentally or maliciously.

The overall cyber security policy and implementation shall account for:

a) Prevent unauthorized users from reading or writing data or files, executing programs or performing operations without appropriate privileges.

b) Document all user sign on procedure

c) Record all network traffic for detecting unauthorized activity, unusual activity and attempts to defeat system security (AMISP to propose and document what constitutes normal activity/traffic)

d) A user authentication scheme consisting of at least a user identification and password shall be required for the user to request a connection to any network node.

e) GUI to provide role-based access based on user identity and user role. Shall have following types of users:

   i. Administrator

   ii. Operator

   iii. Field staff

   iv. Viewer/Guest

2.2.4 Communication Network Elements

Following sections provide detail on both DCU based communication network and router-based RF mesh network. The AMISP shall select relevant parts as applicable for designing and establishing communication infrastructure. The network shall be horizontally and vertically scalable to accommodate future meter installations for additional 50 % Meters. . The network elements may be comprised of the following.

2.2.4.1 Data Concentrator Unit (DCU) based Communication Network

The Data Concentrator Unit is a gateway for communication of data between the Smart Meters and the HES. The Data Concentrator Unit receives information from the Smart Meter on a scheduled / need basis and passes it on to HES / MDM.

The DCU provides the central link between Smart Meters and HES, enabling continuous/periodic meter-read and control. DCU shall exchange data from Smart Meters on RF / PLCC communication and with HES on WAN.

2.2.4.1.1 Hardware & Power Supply of DCU

a) Enclosure/box of DCU shall be IP65 or better compliant. A suitable mounting arrangement required for DCU installation shall also be provided.

b) A suitable and optimum power supply shall be provided keeping in view that even in case of outage in one or two phases, DCU can be powered. DCU should be capable of withstanding surges & voltage spikes of 6 kV. Power supply shall be terminated on suitable sized Miniature Circuit Breaker (MCB) to facilitate isolation during on-site maintenance.

c) DCU shall have battery with backup for 1(one) hour for normal meter reading, to push tamper event, carry out on demand reading and the network health status/ connectivity continuity & check. DCU should have the suitable feature to send power outage and restoration message to the HES.

d) DCU shall have built-in Real Time Clock (RTC) with separate battery backup. It shall have self- diagnostic feature for RTC, memory, battery, communication module, etc.

2.2.4.1.2 Configuration, Functionality & Interface of DCU

DCU shall have following configuration functionalities / tools:

a) Configuring the communication with underlying nodes/meters.

b) Communication of data from the field devices and push the data at configured intervals to the HES. It should also support the HES in pulling data from the field devices/meters. The data acquisition (Push/Pull) frequency shall be configurable. DCU shall be capable to prioritize control commands.

c) DCU shall ensure a secure communication to HES and shall have internal memory for storing interval data for at least 5(five) days. This storage shall be in non-volatile memory as opposed to battery backed memory.

d) DCU shall support on demand read and ping of individual/group of meters.

e) It shall support IPv6 network addressing.

f) DCU shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters.

g) The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP65). A suitable mounting provision shall be made for the equipment.

h) Enclosure: Provision for security sealing shall be provided and in case the gasket of the cover is used for protection against moisture, dust and insects, the gasket shall be made of weather and aging resistant material.

i) The list of standards followed in all the devices/equipment used in communication network shall be furnished

j) The communication network shall have dynamic & self-healing capability. If one of the communication elements fails, then nodes connecting to that

element shall switch to best available element for communication of data to HES.

2.2.4.1.3 DCU Communication

a) The DCU shall ensure the appropriate backhaul for secure transfer of data to HES either via cellular or Fiber Optic communication. In case of cellular backhaul, it shall support SIM card / e-SIM with dynamic/static IP as the architecture demands from any service provider. It shall have Wide Area Network (WAN) connectivity to the HES through suitable means. Best available link shall be used to connect to HES.

b) DCU shall be able to communicate with meters through a secured, standard communication protocol between meter and DCU.

c) DCU shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads.

d) It shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters. DCU shall be able to acquire and send data to HES for full capacity (as per designed for no. of meters/field devices) to ensure the performance level. Full capacity of DCU is required to be indicated in the offer.

e) On restoration of power supply, DCU shall establish communication with underlying devices as well as upstream application automatically.

f) DCU shall be able to communicate with the nearest meters.

g) Remote firmware upgrade: The DCU shall support remote firmware upgrades as well as remote configuration from the Network Operation cum Monitoring Centre (NOMC)

h) DCU shall facilitate recording of minimum of the following events at HES (for 7 days):

   i. No of packet failures

   ii. Retry attempts

   iii. Missed periodic readings

   iv. Failure to connect

   v. Tamper events

2.2.4.2 Gateway/ Router/ Access Point based RF Mesh Network

In this type of communication network, different network nodes including end points (Smart Meters) shall interconnect with each other using RF mesh network and they shall communicate with nearby gateways/ routers to transfer the data to access points. If any gateways/ routers/ repeaters/ access points fail, then nodes connected on that device shall automatically reconfigure the mesh with available nearby nodes.

2.2.4.2.1 General Requirement of RF Mesh Network:

a) The communication network shall have dynamic & self-healing capability. If one of the communication elements such as gateways/ routers/ access points fails, then nodes connecting to that element shall switch to best available element for communication of data to HES.

b) It shall support IPv6 network addressing.

c) Each node shall keep a track of best available nearby nodes or access points.

d) The communication network equipment shall use Unlicensed or Licensed frequency band as permitted by WPC/Statutory Bodies as applicable.

e) All the communication network equipment shall be as per WPC guidelines, Government of India for operation in licensed / license free frequency band.

f) Suitable NMS shall be available to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration, parameterization of the networking devices and the nodes.

g) It shall support remote firmware upgrading

h) It shall be secure enough to avoid all cyber threats

i) The communication network shall ensure secure communication of data to HES.

j) The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP65). A suitable mounting provision shall be made for the equipment.

k) The list of standards followed in all the devices/equipment used in communication network shall be furnished.

l) Gateway/ Router/ Access Point shall have battery with backup for 1(one) hour for normal meter reading, to push tamper event, carry out on demand reading and the network health status/ connectivity continuity & check etc. during battery operations also. It should have the suitable feature to send power outage and restoration message to the HES even during battery back-up.

2.2.4.2.2 Configuration, Functionality & Interface

Access points shall have following configuration functionalities:

a) It shall be able to configure the communication with underlying nodes/end points.

b) It shall support on demand read and ping of individual/group of meters.

c) It shall push events such as tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters.

d) It shall have Wide Area Network (WAN) connectivity to the HES through suitable means.

e) It shall communicate with gateways/ routers/ nodes/ end points/ access points on RF mesh network (Unlicensed or Licensed frequency band as permitted by WPC/Statutory Bodies in country of deployment as applicable).

f) It shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads.

g) After power Interruption, on restoration of power supply, it shall establish communication with underlying devices as well as upstream application (HES) automatically.

h) Access point shall facilitate recording of minimum of the following events at HES (for seven (7) days):

   i. No of lost packets

   ii. Retry attempts

   iii. Missed periodic reading

   iv. Failure to connect

   v. Tamper events

i) It shall be capable to handle interval data of suitable nos. of any type of Smart Meter. Access point shall be able to acquire and send data to HES for full capacity (No. of meters/field devices it is designed for) within a suitable time period to achieve the performance level. Full capacity of access point is required to be indicated in the offer.

j) Gateway / Router / Access point shall support remote firmware upgrades as well as remote configuration from the Network Operation cum Monitoring Centre.

k) The Gateway / Router / Access Points shall have provision to maintain the time and date information and shall always be in Time synchronization to the HES server via NTP to sub second accuracy. The Gateway / Router / Access Points shall support time distribution to each Mesh Node.

2.3 Head End System (HES)

The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters.
The AMISP shall provide a HES which is suitable to support the collection and storage of data as per performance level for a defined no. of Smart Meters with facility of future expansion of additional 50 % of Meters as per the requirement specified in this document.
HES shall be responsible for discovery of all Smart Meters once deployed in the field, the periodic collection of all meter data as well as the processing of all alarms and commands such as connect/disconnect for those meters.
HES would perform all the requisite functions as per the defined functionalities of AMI and it is the responsibility of the AMISP to supply the requisite software and hardware to achieve the defined functionalities of AMI. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data.

HES shall be developed on open platform based on distributed architecture for scalability without degradation of the performance using additional hardware. The scalability shall ensure the ability to handle applicable workloads including the following:

a) Up to 150% numbers of meters installed
b) 15 mins interval meter reads
c) Around 200 users requesting data from meters
d) Other events and statuses coming from meters.

The HES shall be cloud enabled and support deployment with high availability clustering and automatic load balancing that ensure hardware as well as application failover. Adequate data base and security features for storage of data at HES need to be ensured.
The suggested functions of HES (not exhaustive) may be:

a) On power up after installation, Smart Meter shall register itself automatically into the HES along with its metering profile. The HES shall store meter profile status by meter type, hardware & software versions, device IDs, logged in / logged out details etc.
b) Upon deployment and establishment of communication, it shall be possible for field level end device nodes (NAN/WAN) like Router/Gateway, Access Point, DCU to have self-discovery and registration.
c) Acquisition of meter data on demand & at user selectable periodicity. On demand meter read may be for single meter (unicast) or for a group of meters (multicast).
d) Two-way communication with meter/ DCU
e) Signals for connect & disconnect of switches present in end points such as meters. This facility shall be provided for both single meter (unicast) as well as for a group of meters (multicast).
f) Audit trail and Event & Alarm Logging
g) Ability to redirect messages including configuration commands from the MDM in order to reach the desired meter
h) Maintain time sync with DCU / meter
i) Store raw data for defined duration (minimum 45 days). HES shall hold the data before it is transferred to the MDM. However Billing Data of smart Meter shall be permanently available upto contract period at HES Level.
j) Handling of Control signals / event messages on priority
k) Manage time distribution to ensure that nodes / meters always have an accurate RTC using NTP servers. The time distribution mechanism shall take into account the network latencies.
l) Setting of Smart Meter configurable parameters
m) Critical and non-critical event reporting functionality
n) Device management functionality to get periodic updates from devices on health check, hardware & firmware version, location mapping etc.
o) The data collection and computation for the purpose of SLA penalties (as mentioned in the following table) should be automated and visualized in Utility Interface as per Clause 2.5 of this Section.

2.3.1 Configuration

HES shall facilitate configuration of following minimum AMI parameters:

a) Load profile capture period

b) Demand integration period

c) Setting of parameters for TOU billing

d) Prepaid / post-paid configuration

e) Net metering

f) Billing date / month-to-date for prepaid meters

g) Clock setting/time synchronizations

h) Load curtailment limit

i) Event setting for connect/disconnect

j) Number of auto reconnection attempt

k) Time interval between auto reconnection attempts

l) Lock out period for endpoint (meter) relay

m) Remote firmware update: It shall be possible to update the firmware of the meters in both Unicast (one to one) and in Multicast fashion (Group of meters). It shall be also possible to have remote firmware upgrade for an individual and a group of nodes (NAN/WAN, Routers/Gateways/Access Point, DCU. Multi Factor Authentication (MFA) must be implemented for executing Firmware upgrade operation.

n) Password setting

o) Push schedule

p) Setting threshold limits for monitored parameters

q) Setting threshold limits for the number of and duration between simultaneous remote disconnections

The AMISP may suggest more parameters as per the requirement.

2.3.2 Communication

The following communication functions with network devices shall be supported:

a) HES shall communicate with DCUs/Access points/gateway/router using WAN technology

b) HES shall encrypt data for secure communication

c) HES shall be able to accept data according to IS 15959 part-2 /part 3 and latest amendments

d) HES shall automatically retry for missed data; the number of retry attempts shall be configurable

e) To receive confirmation on successful execution of a command

f) HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data

2.3.3 Monitoring and Reporting Capability

HES shall have critical and non-critical reporting functionality. The critical & non-critical information generated from this reporting functionality shall be made available to MDM at user configurable periodicity.

2.3.3.1 Critical Reporting

HES shall have alarms and keep record of following events:

a) Event log for node's (meter) events such as tamper/power failures etc.

b) Data not received from nodes/end points

c) Relay does not operate for connect / disconnect

d) Communication link failure with nodes/end points

e) Network Failure

f) Power Failure

2.3.3.2 Non-Critical Reporting

HES shall report and keep record of following communication failure events:

a) Retry attempts

b) Missed periodic reading

c) Failure to connect

HES shall support reporting of communication failure history of nodes/routers/access points etc. and give an exception report for nodes/routers/access points not communicating for last 0 – 24 hours (the reporting period shall be on user configurable period). HES shall have feature to send email/SMS notification of configured alarms & events to its users.

2.4 Meter Data Management system (MDM)

~~AMISP shall be responsible to ensure connectivity from their cloud infrastructure (i.e. where HES and other application hosted etc.) to other cloud infrastructure (where Purchaser's Common Meter Data management Solution (CMDM solution) hosted). This includes procurement of additional bandwidth / MPLS line or better secured connectivity etc. by the contractor for seamless integration of HES with Purchaser's CMDM solution. MDM is hosted in Microsoft Azure. AMISP to take MPLS connectivity or better security connectivity from SIM to Cloud and for connectivity to MDM.~~

The Meter Data Management system (MDM) shall support storage, archiving, retrieval & analysis of meter data and various other MIS along with validation & verification algorithms. The MDM shall be a scalable and COTS product. 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. It shall provide validated data for upstream systems such as billing, analytics, reporting, etc.

As mentioned in Clause 1.2 (g) of this Schedule, MDM should support the future requirement of utility by way integration with other smart grid functionalities as listed in Clause 1.2 (g) as and when implemented by Utility. In this effort, the methodology as outlined in the approach paper shall be followed.

The key use cases to be enabled by AMISP for contiguous electrical locations as mentioned in 1.2(A) and non-contiguous electrical locations as mentioned in 1.2 (B) are provided below. Please note that these are illustrative list of use cases only and is not an exhaustive list. Further please note that all IS Standards shall be applicable.

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
1.	**Collection of Daily Meter Profile**			
1.1	At scheduled frequency HES should pull the Daily Meter Data from Smart Meter over communication Channel	HES	Meter	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
1.2	Meter should send the data to HES. Provision for retrial should be there if Meter data is not collected within time. Consumption details including non-critical events will be in 15 min/30 min block data, and data could be incremental to what was sent by meter in preceding instance	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
1.3	HES should send the data to MDM	HES	MDM	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF
1.4	MDM should send the required parameter to Prepaid system for daily charge calculation at least once on daily basis	MDM	Prepaid Engine	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.	**Monthly Billing profile collection**			
2.1	Command from Billing system triggered and send to MDM / HES for collection of Monthly billing Data	Billing System	MDM / HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.2	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
2.3	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

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
2.4	HES should decrypt and validate the data collected and send to MDM	HES	MDM	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.5	MDM should send the required parameter to Billing system for Monthly Bill calculation	MDM	Billing Engine	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
3.	**Remote Meter disconnection**			
3.1	Meter disconnect operation command after wallet balance calculation	Prepaid Engine/ Billing system	MDM	Meter Number, group of meters, instruction to close switch
3.2	Disconnection alert sent to consumer	MDM	Billing System	Meter Number, group of meters, instruction to close switch
3.3	Meter disconnection operator command	MDM	HES	Meter number, action (disconnect)
3.4	Consumer meter disconnection	HES	Meter	Meter Number, switch status
3.5	Disconnection Status Update	Meter	HES	Meter Number, switch status
3.6	Disconnection Status Update	HES	MDM	Meter Number, switch status
4.	**Remote Meter Reconnection**			
4.1	Meter reconnect operation command after wallet recharge Billing	Billing system/ Prepaid Engine	MDM	Meter Number, group of meters, instruction to close switch
4.2	Meter reconnect operation command	MDM	HES	Meter Number, group of meters, instruction to close switch
4.3	Consumer meter reconnection	HES	Meter	Meter number, action (reconnect)
4.4	Reconnection Status Update	Meter	HES	Meter number, action (reconnect)
4.5	Reconnection Status Update	HES	MDM	Meter number, action (reconnect)
5.	**Utility detects tampering at consumer site**			
5.1	High priority events captured by Meter sent to HES as and when occurred	Meter	HES	Meter Number, event date& time, event Code /description

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
5.2	High priority events reach MDM for further action.	HES	MDM	Meter Number, event date& time, event Code /description
5.3	Share with WFM to Notify utility personnel for site inspection	MDM	WFM	Consumer number, Meter Number, Tamper code, address
5.4	On analysis and detection of valid tamper event or malfunction, the tamper event must be sent / pushed by the meter to the HES /MDM	Meter	HES/ MDM	Consumer number, meter number, action to be triggered (disconnect), action date & time
5.5	HES sends disconnect command to meter	HES	Meter	Meter Number, action (disconnect)
5.6	Tamper event shared with CIS/CRM. Billing determinants are updated for tamper invoicing	MDM	CIS / CRM	Meter Number, event date & time, event Code /description
5.7	Meter re-connection order once tamper issue is resolved	MDM	HES	Meter number, action (re-connect)
5.8	HES sends re-connect command to meter	HES	Meter	Meter Number, action (re-connect)
6.	**Missed interval readings**			
6.1	On identifying missed interval, HES will re-acquire data for the missing period from meter	HES	Meter	Meter Number, from date &time, to date & time (for which data is missing)
6.2	On receiving data request command, meter will send data to HES	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh
6.3	Missed Interval and Reads Data acquired by MDM	HES	MDM	Meter Number, readings with date & time
7.	**Consumer connection outage/restoration event**			
7.1	Outage/restore event recorded by meter is sent to HES as and when event occurs	Meter	HES	Meter Number, Outage / restoration Date / Time, Power On or Off count
7.2	Outage / Restoration Notification	HES	MDM	Meter Number, Outage / restoration Date / Time, Power On or Off count

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
7.3	Sharing Outage / Restoration Notification	MDM	OMS/CIS-CRM	Meter Number, Outage / restoration Date / Time, Power On or Off count
7.4	Meter read request from OMS to identify service outage / restoration	OMS	MDM → HES	Meter Number,
7.5	Meter responds to event poll from HES	Meter	HES	Meter number, Status (live/dead)
8.	**Remote firmware upgrades/ meter configuration changes**			
8.1	Remote firmware upgrade	HES	Meter	Firmware
8.2	Configuration Commands: Change tariff parameters, Synchronize clock, Registers reset (status, max, tampering)	HES	Meter	Meter number, tariff parameters, registers status, event type and priority
8.3	Status update of Firmware / Configuration	Meter	HES	
9.	**Load monitoring at demand side**			
9.1	When there is a load violation event recorded in the meter, the information is sent to the CC	Meter	HES → MDM	Meter Number, max demand, date & time of load violation
10.	**Time synchronization**			
10.1	Synchronizing RTCs of meters / DCUs/ACP	HES	DCU/Meter	Time Setting
11.	**Metering network changes**			
11.1	Change / new installation in Meter / DCU Network Hierarchy	Meter / DCU	HES	Network identification info including DCUs
11.2	Change / new installation in Meter / DCU Network Hierarchy	HES	MDM	Network identification info including DCU
12.	**New consumer connection**			
12.1	Receive verified pre & post-paid new consumer requests	CIS-CRM/ Billing	MDM	Consumer name, address. Connection request etc.
12.2	Generate meter installation order	MDM	/WFM	Consumer ID & details
12.3	Receive meter installation report	WFM	MDM	Meter number, DT no, Feeder & reading
12.4	Requesting instant,	MDM	HES → Meter	Meter Number, Reading date & time,

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
	interval & events data from meters			reading params (kWh, kVAh, kW etc.)
12.5	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
12.6	Once new meter remote read verification is over, confirm new connection with other applications	MDM	Billing / CIS-CRM	Consumer ID, Consumer address, Meter Number, initial reading etc.
13.	**Migrate post-paid consumer to prepaid mode**			
13.1	Receive migration request	CIS-CRM/ Billing	MDM	Migration request for post-paid consumer with profile
13.2	Setup prepaid consumer profile in prepaid engine. If no change in meter is required, skip next two steps	MDM	Prepaid Engine	Prepaid consumer profile
13.3	Generate prepaid meter installation order if required	MDM	WFM	Consumer ID & details
13.4	Receive meter installation report	WFM	MDM	Meter number, DT no, Feeder & reading
13.5	Enable prepaid mode in meter	Prepaid engine	HES → Meter	Engineering token
13.6	Receive activation confirmation	HES	MDM	Activation status
13.7	Request instant, interval & events data from meter	MDM	HES → Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
13.8	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
13.9	Once meter remote read verification is over, share migration request completion detail with other modules	MDM	Billing / CIS-CRM	Prepaid consumer profile
14.	**Migrate prepaid consumer to post-paid mode**			

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
14.1	Receive migration request	CIS-CRM	MDM	Migration request for prepaid consumer with profile
14.2	Request meter data	MDM	HES → Meter	Meter Number, Consumer ID
14.3	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.) with balance credit
14.4	Send meter disconnect command	MDM	HES → Meter	
14.5	Receive connection status	HES	MDM	Disconnect status
14.6	Enable post-paid mode in meter	MDM	HES → Meter	Engineering token
14.7	Receive activation of post-paid mode	HES	MDM	Activation Status
14.8	Request instant, interval & events data from meter	MDM	HES → Meter	Meter Number, Consumer ID
14.9	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
14.10	Once meter remote read verification is over, share migration request completion detail with other modules	MDM	Billing / CIS-CRM	Post-paid consumer profile and meter data along with credit balance
15.	**Consumer Registration in Consumer Portal/ App**			
15.1	Consumer clicks on new user on consumer portal/ App, provides RMN or email ID and submits data	Portal/ App	CIS/CRM	Request for registration with RMN/email ID
15.2	Utility receives request for registration and sends OTP after verification	CIS/CRM	Email/Message Gateway	OTP
15.3	Consumer submits OTP	Portal/ App	CIS/CRM	
15.4	Consumer receives registration detail	CIS/CRM	Email Gateway	Login ID and default password

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
15.5	Consumer submits first login request	Portal/ App	CIS/CRM	
15.6	System seeks password change	CIS/CRM	Portal/ App	
15.7	Consumer changes default password	Portal/ App	CIS/CRM	
16.	**Consumer Access to Consumption, Billing& Profile Data**			
16.1	Consumer logs in to Portal/ App	Portal/ App	MDM	
16.2	Consumer Profile for Portal/ App	CIS-CRM	MDM →Portal/ App	Name, Account, Address, Service Points, K Number
16.3	Consumption Data	MDM	Portal/ App →UI	Consumption profile
16.4	Billing (post-paid) / Credit Balance (prepaid)	Billing → MDM	Portal/ App	Post-paid Billing history/ Current Bill, Prepaid Recharge history
17.	**Prepaid Consumer Recharge**			
17.1	Consumer logs into Portal / Mobile App	Mob App / Portal	UI	Login
17.2	Consumer fills-in required detail in UI and requests recharge	UI→ Prepaid App	Payment Gateway	Consumer ID, Recharge amount
17.3	Consumer selects payment method	Payment Gateway	Net banking /Credit Card / Wallet etc.	
17.4	Consumer receives payment acknowledgement	Payment Gateway	Prepaid App→Portal →UI	
17.5	Calculate credit balance for prepaid consumer & update prepaid meter	Prepaid App	HES→Meter	Consumer credit balance (virtual token)
17.6	Notify credit balance to consumer	Prepaid App	Email/SMS Gateway	Credit Balance
18.	**Post-Paid Consumer Bill Payment**			
18.1	Consumer logs into Portal / Mobile App	Mob App / Portal	UI	Login
18.2	Consumer is presented with Billing history and current outstanding Bill	Billing → MDM	Portal/ App→UI	Outstanding Bill

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
18.3	Consumer requests bill payment. Option to download bill	UI→Billing	Payment Gateway	
18.4	Consumer selects payment method	Payment Gateway	Net banking /Credit Card / Wallet etc.	
18.5	Consumer receives payment acknowledgement	Payment Gateway	Billing→ Portal/ App→UI	
18.6	Payment acknowledgement through email/SMS	Billing	Email/SMS Gateway	Payment acknowledgement
19.	**Consumer Service Request**			
19.1	Consumer logs in to Portal/ App	Portal/ App	CIS/CRM	
19.2	Consumer requests for service	UI	CIS/CRM	Service request
19.3	System assigns SRN & sends acknowledgement	CIS/CRM	Portal/ App→UI, Email/SMS Gateway	
19.4	System resolves request & updates consumer records	CIS/CRM	Portal/ App→UI, CIS/CRM	
19.5	System closes SRN	CIS/CRM	Email/SMS Gateway	
20.	**Consumer Complaints**			
20.1	Consumer logs into Portal/ App	Portal/ App	CIS/CRM	
20.2	Consumer registers complaint	UI	CIS/CRM	Specific complaint
20.3	System assigns CRN & sends acknowledgement	CIS/CRM	Portal/ App→UI, Email/SMS Gateway	
20.4	System assigns resolution based on nature of complaint	CIS/CRM	CIS / OMS / WFM	
20.5	Target system reports completion of complaint	OMS / WFM	CIS/CRM	
20.6	System updates records and closes CRN	CIS/CRM	CIS, Email/SMS Gateway	
21.	**Demand read of meters from consumer premises**			

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
21.1	Requesting instantaneous, interval, load profile & events data from meters	MDM	HES→Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
21.2	Acquire instant, interval, load profile & events data from meters by HES which then reaches MDM system.	Meter→ HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
22.	**Staff User Access to Utility Portal**			
22.1	User logs in to Portal	Portal	MDM	Login with appropriate credentials
22.2	User selects available functions	MDM	Portal → UI	
22.3	User logs out	Portal → UI	MDM	

The key use cases to be enabled by AMISP for non-contiguous electrical locations as mentioned in Section 6 Clause 1.2 (C) are provided below. Please note that these are illustrative list of use cases only and is not an exhaustive list. Further please note that all IS Standards shall be applicable.

Sr.	*Use Case Activity Description*	*Source*	*Destination*	*Info Exchanged*
1.	***Collection of Daily Meter Profile***			
1.1	*At scheduled frequency HES should pull the Daily Meter Data from Smart Meter over communication Channel*	*HES*	*Meter*	*Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Noncritical Event Code / Date*
1.2	*Meter should send the data to HES. Provision for retrial should be there if Meter data is not collected within time. Consumption details including non-critical events will be in 15 min/30 min block data, and data could be incremental to what was sent by meter in preceding instance*	*Meter*	*HES*	*Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Noncritical Event Code / Date*
1.3	*HES should send the data to MDM*	*HES*	*MDM*	*Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF*
2.	***Utility detects tampering at meter site***			

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
2.1	High priority events captured by Meter sent to HES as and when occurred	Meter	HES	Meter Number, event date & time, event Code /description
2.2	High priority events reach MDM for further action.	HES	MDM	Meter Number, event date & time, event Code /description
2.3	Share with WFM to Notify utility personnel for site inspection	MDM	WFM	Meter Number, Tamper code, address
2.4	On analysis and detection of valid tamper event or malfunction, the tamper event must be sent / pushed by the meter to the HES /MDM	Meter	HES/ MDM	Meter number, action date & time
3.	**Missed interval readings**			
3.1	On identifying missed interval, HES will re-acquire data for the missing period from meter	HES	Meter	Meter Number, from date & time, to date & time (for which data is missing)
3.2	On receiving data request command, meter will send data to HES	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh
3.3	Missed Interval and Reads Data acquired by MDM	HES	MDM	Meter Number, readings with date & time
4.	**Meter connection outage/restoration event**			
4.1	Outage/restore event recorded by meter is sent to HES as and when event occurs	Meter	HES	Meter Number, Outage / restoration Date / Time, Power On or Off count
4.2	Outage / Restoration Notification	HES	MDM	Meter Number, Outage / restoration Date / Time, Power On or Off count
4.3	Sharing Outage / Restoration Notification	MDM	OMS/CIS-CRM	Meter Number, Outage / restoration Date / Time, Power On or Off count
4.4	Meter read request from OMS to identify service outage / restoration	OMS	MDM → HES	Meter Number,
4.5	Meter responds to event poll from HES	Meter	HES	Meter number, Status (live/dead)
5.	**Remote firmware upgrades/ meter configuration changes**			
5.1	Remote firmware upgrade	HES	Meter	Firmware

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
5.2	Configuration Commands: Change tariff parameters, Synchronize clock, Registers reset (status, max, tampering)	HES	Meter	Meter number, tariff parameters, registers status, event type and priority
5.3	Status update of Firmware / Configuration	Meter	HES	
6.	**Load monitoring at demand side**			
6.1	When there is a load violation event recorded in the meter, the information is sent to the CC	Meter	HES → MDM	Meter Number, max demand, date & time of load violation
7.	**Time synchronization**			
7.1	Synchronizing RTCs of meters / DCUs/ACP	HES	DCU/Meter	Time Setting
8.	**Metering network changes**			
8.1	Change / new installation in Meter / DCU Network Hierarchy	Meter / DCU	HES	Network identification info including DCUs
8.2	Change / new installation in Meter / DCU Network Hierarchy	HES	MDM	Network identification info including DCU
9.	**New meter connection**			
9.2	Generate meter installation order	MDM	WFM	Meter Number & details
9.3	Receive meter installation report	WFM	MDM	Meter number, DT no, Feeder & reading
9.4	Requesting instant, interval & events data from meters	MDM	HES → Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
9.5	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
9.6	Once new meter remote read verification is over, confirm new connection with other applications	MDM	Billing / CIS-CRM	Meter address, Meter Number, initial reading etc.
10.	**Demand read of meters from meter premises**			
10.1	Requesting instantaneous, interval, load profile & events data from meters	MDM	HES→Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
10.2	Acquire instant, interval, load profile & events data from meters by HES which then reaches MDM system.	Meter→ HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
11.	**Staff User Access to Utility Portal**			
11.1	User logs in to Portal	Portal	MDM	Login with appropriate credentials
11.2	User selects available functions	MDM	Portal → UI	
11.3	User logs out	Portal → UI	MDM	

The AMISP shall specify and deliver an initial system that supports the collection and storage of data for meeting the performance level for around 100% of ordered Smart Meters with future expansion of additional 50 % Meters with facility of future expansion.
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)].

The architecture of MDM and system integration will be approved by Discom. In case any changes/reporting structure suggested by the Discoms during project implementation period, the AMISP shall be liable to implement the same.

The AMISP shall be responsible for supply, installation, integration, testing, and commissioning of a new MDM . The bidder shall also ensure integration of the proposed MDM and HES with the existing Utility database , billing system and any other system to be developed by Discom in future.

2.4.1 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 software 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) Ability to report and log any damage / deterioration in the meter attributable to consumer /utility.

2.4.2 AMI Installation Support

a) The MDM shall also support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDM 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.

2.4.3 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 MDM 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 MDM 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 MDM shall provide storage and retrieval of all collected Meter Data, events and alarm. It shall have capacity of storing 10 years data (as required by the utility based on regulatory provisions) via archiving

d) The archiving of data should be done at a frequency of [x] and all data older than [x] days/hours should be archived. AMISP's solution should describe the process of archiving and restoration from the archive.

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 MDM shall have the ability to manage at a minimum 5-minute interval data.

j) The AMISP shall ensure data integrity checks on all metered data received from data collection systems.

2.4.4 Data Validation, Estimation, and Editing (VEE)

a) The validation and estimation of metered data shall be based on standard estimation methods (such as max/avg. of past three days, max/avg. of past X

number of similar weekdays, max/avg. of similar blocks of past X numbers of similar weekdays, etc.). The MDM should also support and maintain following data-

i. Registered Read Data including register reads, daily billing cycle, as well as derived billing determinants such as TOU

ii. Interval Data channels with variable intervals and variable units of measure

iii. Calculated Data that is derived or computed such as billing determinants and aggregated loads.

iv. Event data storage of all collected event and alarm data from meters, network equipment, and MDM itself

b) MDM shall flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in the cumulative ("CUM") register reads

i. CUM decrements within a billing cycle (except net-metering)

ii. CUM reads increments more than configurable threshold

iii. Future or old read dates

iv. Number of digits exceeds number of meter dials

c) MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Time of Use (TOU) register reads

i. Register decrements (except net-metering)

ii. Resets (to zero) (except net-metering)

iii. CUM reads increments more than configurable threshold

iv. Future or old read dates

v. Erratic compared to CUM read (sum of TOU reads minus CUM read)

d) MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Demand register reads

i. Do not reset on cycle

ii. Do not reset coincident with consumer move-out or move-in

iii. Reset off cycle inappropriately

iv. Too high

e) All data shall be transferred to billing system after meter data validation and estimation including transformer / feeder station wise energy audit.

f) MDM shall estimate usage for non-metered service points such as streetlights, farm lights, traffic signals, etc.

g) The MDM shall maintain both the original received raw data in a non- manipulated state, in addition to VEE data.

h) Notwithstanding the latency of data collection via the AMI system, once the MDM receives meter read data, the VEE process occurs in real-time and the post-VEE data is then immediately available to user or external systems.

i) The MDM shall be able to automatically flag data changes from manual edits, VEE (Validating, Editing and Estimating) rules and data source corrections and electronically generate audit trail with timestamps and user-ids.

2.4.5 Billing Determinants Calculations

The MDM-

a) Shall allow configuring multiple TOU options (e.g., the number and duration of TOU rate periods) by consumer type, tariffs and day type (weekend, weekdays, and holidays) and by season.

b) Shall support the processing of interval data into billing determinants to include the following at a minimum:

   i. Total Consumption

   ii. Consumption in different time blocks for ToU billing

   iii. Maximum Demand (in kW and kVA)

   iv. Number of tamper counts

   v. Average power factor

   vi. Net-Metering data

c) Shall process interval data and frame it into the appropriate TOU periods for consumption and demand; for example, roll up 15/30-minute data intervals into hourly data.

d) Shall have the ability to properly account for special metering situations such as check metering, sub metering, prepaid metering and net metering when calculating billing determinants and sending them to billing and other systems.

e) Shall have the ability to properly account for special situations including, but not limited to, curtailment requests, demand response scenarios (based on use cases provided in Annexure H) when calculating billing determinants and sending them to billing software.

f) Shall have the ability to facilitate implementation of automatic compensation payments by Utility to consumers for sustained outages when requested. Compensation calculations would require cross checking with billing and consumer balance information to ensure that disconnection is not construed as a no supply event.

2.4.6 Prepaid functionality

The MDM with the help of the corresponding HES, should be able to switch the Smart Meter between prepaid and post-paid modes by a simple change in configuration of the Smart Meter firmware remotely. The following prepaid functionality shall apply

a) MDM shall use consumer attributes from Consumer Care System (CCS) and/or Utility Billing system to,

   i. enrol and setup new prepaid/ post-paid consumers

   ii. migrate existing post-paid consumers to prepaid mode and vice versa

b) An appropriate pre-payment application engine shall support the pre-payment metering capability through the delivered system.

c) The prepayment system shall ensure that payment and connection parameters are stored centrally, and the details are updated to CIS-CRM/MDM through consumer portal/ app as per Clause 2.5 of this Section. Information required by consumer's Mobile App and web portal are shared in near real time.

d) Prepaid consumers shall be provided facility to recharge their account by logging on to the consumer portal/app as per Clause 2.5 of this Section.

   i. The user interface shall be integrated with the present online payment gateway of the utility. Additional payment gateways shall be implemented if required

   ii. The payment gateways shall facilitate payments through on-line banking, credit cards and payment wallets

e) A prepaid mobile application functionality shall be provided as a recharge option for android OS and iOS. The consumer portal/ app, shall enable consumers to recharge as well as view recharge history, existing balance, daily usage etc.

f) In addition to billing determinants, the MDM shall share, consumer recharge and credit updates with the utility Billing system. Any re-conciliation shall be carried out in the Billing System and the same shall be shared with the MDM for use by the prepayment application.

g) The system shall periodically monitor the energy consumption of prepaid consumer and decrease the available credit based on consumption. For this purpose, the MDM shall fetch billing data (kWh/kVAh consumption and MD) at configured intervals[1] from the prepaid meter. The raw billing data shall be subjected to standard VEE rules before being used to update recharge balance with the help of applicable tariff slabs. The credit balance is updated into meter at re-charge time.

h) The prepayment application shall use determinants such as minimum fixed charges, TOU tariffs, slab rates, duties & surcharge while calculating consumer credit/balance. Fixed charge shall be deducted on daily basis irrespective of the consumption, even after disconnection of supply and adjusted in the next transaction.

i) The prepayment application should be able to automatically apply different TOU tariffs for future date lines, while calculating consumer credits.

[1]The frequency of pre-configured intervals shall be at least every hour in addition to that at re-charge time

j) The system should send connect/disconnect command based on available credit as per notified rules & regulations.

k) The system should send low-credit notifications to the consumer when their balance approaches a pre-con/figured threshold. Alerts shall initiate on every recharge, low credit and load connection/disconnection. The alerts shall be posted on the consumer web Portal/ App in real time and sent through SMS and email. Consumer should also be alerted through other mechanisms such as one-time alarm / beep from the meter, LED blinking, message, etc.

l) It shall be possible to configure an "emergency" credit limit in INR as well as day terms. This emergency credit shall be used as reserved amount that is consumed when consumer credit is exhausted. The credit amount shall be adjusted in next recharge transaction.

m) It shall be possible to configure certain prepaid consumers where auto-disconnections shall not happen due to negative credit. The conditions/protocols for auto-disconnections are detailed in Annexure I.

n) The pre-payment function as part of MDM shall also have a facility to configure arrear recovery mechanism to recover arrears from a consumer. Some of the indicative mechanism to recover the same can be recovery of [X]% from every recharge amount while the rest goes as charging amount till all the arrears are recovered. Alternately the arrears may be settled in next [X] instalments as decided by utility such that not more than 50% of any instalment shall be adjusted towards arrear.

2.4.7 Net Metering

MDM shall flag, alarm and trigger an estimating process including but not limited to when the following events occur:

a) CUM decrements of forward energy within a billing cycle

b) Register decrements for Time of Use (ToU) of forward energy

c) Power generated(exported) by any net-metering consumer more than the installed capacity of solar PV rooftop system

d) Energy exported in any given day by any net-metering consumer more than the programmable threshold value

Like billing for post-paid meters, the billing for net-meters shall take place in the utility Billing server.

2.4.8 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.

c) Exception Generation - MDM 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 meter/DCU

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

2.4.9 Service Orders

a) The MDM shall generate service orders based on configurable rules for various events and alarms such as stop meter, tampers, problem in communication networks, etc.

b) MDM shall send service orders via SMS, email, etc. with the email addresses / phone numbers being configurable. MDM 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 MDM but processed and closed under jurisdiction of the HES-NMS combine. If the utility already has a separate Workforce Management System (WFM), then the service order tickets can be routed from the MDM and the NMS to the WFM for completion of the tasks and reporting.

2.4.10 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 MDM shall filter out revenue protection alerts that may be caused by field activities if the field activity information is provided to the MDM.

d) The MDM shall support the analytics/investigation (i.e., view current and historical usage patterns) to validate suspected revenue protection issues.

2.5 Utility Interface and Consumer Portal/ App

2.5.1 Utility User Interface

User interface for utility shall have ability for at least the following functionality:

a) Compare total energy costs on one rate schedule vs. one or many alternative rates.

b) Enable the user to see how different options within a rate affect costs.

c) Enable the user to see how adjusting load or consumption levels or shifting them to different time periods influences costs.

d) 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.

e) Allow authorized users to view metered data, initiate and view reports, modify configurations, and initiate and update service requests.

f) 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.

g) Display the energy usage profile for a single meter or group of meters according to Time of Use (ToU) tariff.

h) The UI shall support a configurable utility dashboard for Operations and Utility Management

i) Access to a minimum of three (3) years of historical energy usage and meter reads through the UI.

j) Clearly and visually distinguish between metered, estimated, allocated and substituted data.

k) User management with roles and access rights

l) GUI to provide role-based access based on user identity and user role. Shall have following types of users:

   i. Administrator

   ii. Operator

   iii. Field staff

   iv. Viewer/Guest

m) 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.).

n) Ability to set up alarm and event notifications that can be directed to a combination of configurable email addresses, cellular text messages.

o) UI shall enable viewing of the credit amount updated in MDM for prepaid consumers.

p) Option to send marketing messages and notification to select consumers or selected category of consumers

q) Facility to enable or disable existing functionalities/sections of App/Portal for consumers use.

r) Consumer views to be available to Utility consumer Service Executive also except payment card/bank information.

s) Authorised representative to be enabled for consumer engagement analytics. The analytics to be configurable/ generated with minimal database skill and nil programming requirements.

t) Representative to be able to generate various reports at different intervals the various reports as per Clause 6 of this Section. It shall be also possible to export the report data in multiple formats such as XLS, CSV format, etc.

u) Provide consumer interactions history to enable efficient consumer complaints and queries resolution with consumer information in single screen.

2.5.2 Consumer Portal/ App

Consumer portal and mobile application shall cover all consumer categories and category specific features as applicable prior to operational Go-Live. These apps shall have provision to enable features required to facilitate consumer participation in Demand Response programs which the utility may choose to roll out in future. 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. 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. It shall be noted that the Consumer Portal / App acts as the bridge between the consumers touch point and the existing utility Customer Care and Billing Systems. It does not replace these legacy systems in place. Following features shall be supported by Portal / Mobile app:

a) The mobile app and web portal shall support all device form factors such as mobile, tablet, desktop etc. by recognising 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) The application should be native for better user experience.

f) It shall support multiple languages viz Hindi, English and local language(s). Also, notifications should be sent to consumers in local languages.

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.

Software patches, updates, and version upgrades, when they become available for general release, should be part of ongoing support and maintenance services.

2.5.2.1 Functional Requirements of Consumer Portal/ App

Web portal and Mobile app for consumers should have minimum following functionalities:

a) The consumer portal/app shall have a landing Home page. This page shall provide a brief description about the Utility, any promotional features or advertisement for special programs can be placed in this page. Login Component is provided, and registered users may login using their username and password.

New Users can also register by clicking on the First Time Users Register link. The Forgot Password link helps the user to retrieve their password. New users can register by providing their personal information and setting up of security answers. Forgot passwords can be retrieved or reset using OTP through registered mobile number or through email address. The registered users can change their password and account information as well as registered mobile number through OTP feature.

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 helpdesk of the utility 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, streetlight outage 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. 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.

h) 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.

i) 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.

j) There should be different UI and landing pages for different type of consumers as per the need of utility.

k) 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:

i. View metered data, monthly average usage, current monthly consumption, maximum demand and other reports
ii. View data according to Time of Use (ToU), day, week, month, year and season etc.
iii. Update profile information such as mobile number/email etc.
iv. Guest user account/multi-user account access facility for consumer convenience
v. Initiate request for connection/disconnection
vi. Initiate request to switch between pre-paid and post-paid mode
vii. Initiate service requests for maximum demand updating, meter checking etc.
viii. Initiate complaints such as Meter not working, supply off etc.
ix. In case on net-metering consumers, user can view data for both import & export data
x. Can view recharge history, present balance, next possible recharge date and amount etc.
xi. Historical energy consumption and energy charges during the desired time period
xii. Facility to recharge their account through the payment gateway facilitated by the utility.

2.6 Network Operation & Monitoring Centre

The Network Operations and Monitoring Centre shall cater to the needs of the,

- Project Management Team and the
- AMI network operations team

The Network operation and monitoring centre shall be created in the utility premises by the AMISP, for which suitable built-up space shall be provided by the utility. The built-up space to be arranged by the utility, shall be properly air conditioned, illuminated, and adequate for at least five operator workstations and one cabin for a supervisor.

The AMISP is required to propose a suitable architecture for the Network Operation & Monitoring Centre, ensuring compliance with the security requirements described in this document, which shall be subject to approval by the utility. AMISP shall establish connectivity between the workstations located at the NOMC with that of the cloud-based MDM-HES system. In addition, the AMISP shall establish connectivity between the cloud-based MDM system with utility's existing Billing system. This will necessitate creation of a VPN tunnel between the two unless it is decided to migrate the Billing system to the same cloud data centre.

The AMISP must submit the details of the supplied hardware along with the Bid. The AMISP shall assess the adequacy of hardware specified in the List of Material and Services& if any additional hardware or higher end hardware configurations are required to meet all the requirements of the Technical Specifications, the same shall be included in the offer.

2.6.1 General Requirements for NOMC Hardware

All hardware shall be manufactured, fabricated, assembled and finished with workmanship of the highest production quality and shall conform to all applicable quality control standards of the original manufacturer and the AMISP. All hardware components shall be new and suitable for the purposes specified.

All workstations and network equipment (routers, firewall etc.) shall be compatible for remote monitoring using secure Simple Network Management Protocol (SNMP) Ver. 3.0. All hardware shall support IPv6 simultaneously.

The AMISP shall ensure that at the time of final approval of hardware configuration and List of Material and Services, all the hardware is as per the current industry standard models and that the equipment manufacturer has not established a date for termination of its production. Any hardware changes, except version upgrade in same series, proposed after contract agreement shall be subject to the following:

a) Such changes/updates shall be proposed, and approval obtained from the Utility along with the approval of Drawings/documents.
b) The proposed equipment shall be equivalent or with better features than the equipment included in the Contract.
c) Complete justification along with a comparative statement showing the original and the proposed hardware features/parameters including brochures shall be submitted to the Utility for review and approval.
d) Changes/updates proposed will be at no additional cost to the Utility.
e) The porting of software shall be at no additional cost in case of replacement of hardware during the contract period.

2.6.2 Minimum Technical Requirements for NOMC Hardware

The network operation and monitoring centre shall be equipped with the following minimum hardware components:

a) Six numbers Operator workstations including one for Supervisor

All In One DESKTOP 27-cr0407in (13th Generation intel Core i5-1335U/16 GB DDR4 RAM/1 TB SSD/Windows 11 Home + MS Office 2021/ 27inch FHD/display Keyboard Mouse wireless/1year warranty)

b) A dual redundant 1 Gbps local area network
c) Internet router with at least 48 no's 1 Gbps LAN ports and redundant at least 2 Gbps internet ports supporting IPsec, and SSLVPN capability

d) Firewall and intrusion protection system
e) One video display system of at least 70-inch diagonal with laser light source HD cube (DLP technology) supported by,
   i. Dual power supply
   ii. IP based control options and
   iii. Display Port, DVI, HDMI and Analog D-Sub signal interfaces

or

New configuration :
1m 89cm (75") flip pro WM75B
LH75WMBWLGCXXL
Fast & multi-touch
3-in-1 USB-C port
Video call applications

f) One A3/A4 size laser jet B/W printer with LAN interface
g) One A4 size ink jet colour printer with LAN interface
h) One dual redundant online UPS to support the load of the above-mentioned equipment with minimum 2 hours backup
i) 2 Gbps internet connectivity

The minimum technical specification and requirement to be followed for hardware equipment is as per the table below. < *Hardware Requirements and minimum specification to be defined as per utility requirement*>.

Hardware Item	Minimum Specification	Quantity
Firewall		[X]
WAN Router		[X]
Workstation Console		[X]
Printers		[X]

2.7 System Software Requirements

This section describes the standards and characteristics of system software such as operating system, database and support software (compilers, DBMS, display development, network utilities, report generation, diagnostics and backup utilities) provided by AMISP and the original software manufacturer as necessary to support the functioning of AMI Applications systems. All the system software to be used for the present scope of work shall have valid license(s).

2.7.1 Software Standards

All software provided by the AMISP under this RFP, 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 AMISP shall commit to meet the "open systems" objective promoted by industry standards groups.

2.7.1.1 Design and Coding Standards for AMI Applications and Utilities

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.

a) 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.

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

c) Applications shall not override user selected contrast and colour selections and other individual display attributes.

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

2.7.1.2 Applications

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:

a) **Expansion**: Software shall be dimensioned to accommodate the size of AMI application system as given in List of Material and Services (as mentioned in this RFP) and Annexure E.

b) **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.

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

d) **Portability & Interoperabilit**y: The system shall be designed for hardware independence and operation in a network environment that facilitates interoperability and integration of third-party applications. AMI applications should support multiple Relational Database Management Systems (RDBMS) including Oracle, Microsoft SQL Server and MySQL.

e) **Programming Language**s: 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.

2.7.1.3 Operating System

The operating system of all the equipment of AMI application system including network equipment shall be latest version released up to six months prior to FAT. The operating system shall be hardened to provide robust security. The operating system and data file shall be placed in different disk partitions.

In order to facilitate cyber security requirements including patch management, common operating system is preferable to be used by all server nodes within the AMI application including MDM/HES servers. This is also to minimize the maintenance. All licenses for Operating System and other application software shall be supplied by the AMISP and shall be valid throughout the contract period.

2.7.1.4 Time and Calendar Feature

The AMI application & other servers shall maintain time and calendar for use by various software applications. The internal clocks of all servers and workstation consoles shall be automatically synchronized on Network Time Protocol (NTP) protocol. The calendar shall be customizable for working hours, holidays, weekends etc. The holidays, including type of days, shall be entered for each year at the beginning of the year and shall be recognized by all applications.

2.7.1.5 Remote Diagnostic

Remote Diagnostic facility with necessary hardware as required shall be provided for communication between the AMI application system at the cloud data centre and the NOMC 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 AMISP/utility on such events of remote access and diagnosis.

2.7.1.6 Development System as a Test Bench

A Development system independent of the production environment shall be defined at the cloud data centre which shall provide testing facility for integration of changes/modifications of the AMI application and new field devices before putting it online with Real-time system. This Development system shall be on a VLAN separated from the production VLAN and shall be self-sufficient to carryout testing of changes/ modifications.

2.7.2 Network Communication

The network communications software shall use a standard network protocol such as TCP/IP, UDP etc. and shall support IPv6. The software shall link dissimilar hardware nodes such as local and remote workstations and peripheral devices into a common data communication network allowing communications among these devices. The network communication software shall include network security, security management, patch management and network services of the AMI system. Network communication software shall have scalability feature as envisaged.

2.7.3 Cloud Service Providers (CSP)

This section mentions key requirements from the Cloud Service Provider (CSP). AMISP shall be responsible to provide the services of CSP.

2.7.3.1 General Conditions

The cloud data centre shall have to comply with requirements of tier III category which applies to a concurrently maintainable site infrastructure with redundant capacity components and multiple independent distribution paths serving the critical environment. All IT equipment shall be dual powered. The following general conditions will apply:

a) GI (Megh Raj) or Meity empanelled cloud service provider, Government Community Cloud service providers, should be used.

b) One of the most critical issues in the Cloud Service implementation is the security of the data. It is the responsibility of the AMISP to define the security services that need to be implemented for their workloads depending on the nature of the applications / data hosted on the cloud.

c) AMISP need to ensure that the CSPs facilities/services are compliant to various security standards (as mentioned in Clause 2.7.3.4 of this Section) and should be verified by third party auditors.

d) CSP should suitably address all the potential risks and issues in cloud implementation including data security and privacy, increased complexity in integration with existing environments, vendor lock-in, application portability between different platforms, exit management / Transition-Out Services etc.

e) The AMISP shall be responsible for providing the cloud data centre services. It shall be up to the AMISP, to identify the critical service agreements with the concerned cloud data centre provider in order that the AMISP can meet and sustain the SLA for the AMI project as per Clause 7.7 of this Section.

f) All Services including data should be hosted in India

g) Exit Management / Transition-Out Services -The responsibilities of the CSP during the Exit Management Period need to be agreed upon with the Utility and they should assist the Utility in migrating the data etc.

h) The responsibilities of CSP include migration of the data, content and any other assets to the new environment or on alternate cloud service provider's offerings and ensuring successful deployment and running of the Utility's Solution on the new infrastructure

i) The ownership of the data generated upon usage of the system, at any point of time during the contract or expiry or termination of the contract, shall rest absolutely with the Utility.

The AMISP may also choose to procure the following Managed Services (O&M – Cloud Services) from a Managed Service Provider (MSP) in addition to the cloud services to handhold the department in managing the operations on the cloud. The scope of MSP may include:

a) Migration of Existing Applications to Cloud / Deploying of new applications;

b) Operations & Maintenance Services on Cloud (e.g., Resource Management, User Administration, Security Administration & Monitoring of Security Incidents, Monitoring Performance & Service Levels, Backup, Usage Reporting and Billing Management)

c) Exit Management & Transition-out Services, etc.

2.7.3.2 MeitY's Guidelines

While the security, storage, data and compliance tools are provided by the CSP, it is the AMISP's responsibility to ensure that the CSPs facilities/services are certified to be compliant to standards.

In the MeitY's guidelines to Government Departments on Adoption / Procurement of Cloud Services, the following are included as essential certification by CSP. AMISP also needs to ensure that the CSPs facilities/services are certified to be compliant to the following standards (indicative list provided below):

a) ISO 27001 - Data Center and the cloud services should be certified for the latest version of the standards towards information security management system

b) ISO/IEC 27017:2015-Code of practice for information security controls based on ISO/IEC 27002 for cloud services and Information technology

c) ISO 27018 - Code of practice for protection of personally identifiable information (PII) in public clouds.

d) ISO 20000-1 – Information Technology service management system requirements

e) The CSP's Data Center should conform to at least Tier III standard (preferably certified under TIA 942 or Uptime Institute certifications by a 3rd party) and implement tool-based processes based on ITIL standards.

f) Payment Card Industry (PCI) DSS - compliant technology infrastructure for storing, processing, and transmitting credit card information in the cloud

2.7.3.3 Functional Requirements of the CSP

2.7.3.3.1 Operational Management

a) CSP should provide access of cloud virtual machines either by SSH in case of Linux and RDP in case of Windows servers.

b) CSP should enable Utility to get console access of cloud virtual machine from portal and perform operations. There should be facility to view resource type-wise (VM, database, storage etc.) quota usage. It should be possible to configure automated alerts when the threshold of estimated quota is reached.

c) CSP should upgrade its hardware time to time to recent configuration to delivery expected performance for this Project.

d) Investigate outages, perform appropriate corrective action to restore the hardware, operating system, and related tools.

e) CSP should manage their cloud infrastructure as per standard ITIL framework in order to delivery right services to Project.

f) The CSP should allow different users with different level of access on CSP portal. For example, billing user should not be able to provision resources or delete any resources

g) The CSP should allow quota management for each department/ISV/Group. The resources to specific department/group/ISV should be as per allocated quota only. If there is any request for more than quota request, then it should be sent as request to admin.

2.7.3.3.2 Compatibility Requirements

a) CSP should provide capability to import a Virtual Machine (VM) as an image and support standard formats such as OVA, VMDK, VHD, and raw.

b) CSP should give provision to import cloud VM template from other cloud providers.

c) CSP should ensure connectivity to and from cloud resources used for this project is allowed to/ from other cloud service providers if required.

2.7.3.3.3 Cloud Network Requirement

a) CSP must ensure that the non-production and the production environments are in separate VLANs in the cloud so that users of the two environments are separated.

b) CSP must ensure that cloud VM are having private IP network assigned.

c) CSP must ensure that all the cloud VMs are in same network segment (VLAN) even if they are spread across multi data centres of CSP.

d) CSP should ensure that cloud VMs are having Internet and Service Network (internal) vNIC cards.

e) CSP should ensure that Internet vNIC card is having minimum 1 Gbps network connectivity and service NIC card is on 10 Gbps for better internal communication.

f) In case of scalability like horizontal scalability, the CSP should ensure that additional require network is provisioned automatically of same network segment.

g) CSP must ensure that public IP address of cloud VMs remains same even if cloud VM gets migrated to another data centre due to any incident.

h) CSP must ensure that public IP address of cloud VMs remains same even if cloud VM network is being served from multiple CSP data centres.

i) CSP must ensure that the public network provisioned for cloud VMs is redundant at every point.

j) CSP must ensure that cloud VMs are accessible from Utility private network if private links P2P/MPLS or better secured connectivity is used by Utility

k) CSP must ensure that there is access to cloud VMs if Utility requires to access it using IPSEC/SSL or any other type of VPN.

l) CSP should ensure that cloud VM network is IPV6 compatible.

m) CSP should ensure use of appropriate load balancers for network request distribution across multiple cloud VMs.

2.7.3.3.4 Cloud data centre specifications

a) All the physical servers, storage and other IT hardware from where cloud resources are provisioned including metering data for this project must be within Indian data centres only.

b) Selection of DC-DR site architecture shall be in accordance with applicable laws including but not limited to the "Disaster Recovery Best Practices" guidelines issued by the Ministry of Electronics & Information Technology (MEITy) and as amended from time to time".

c) The CSP data centres should have adequate physical security in place.

d) The Data Centre should conform to at least Tier III standard (preferably certified under TIA 942 or Uptime Institute certifications by a 3rd party) and implement tool-based processes based on ITIL standards.

2.7.3.3.5 Cloud Storage Service Requirements

a) CSP should provide scalable, dynamic and redundant storage.

b) CSP should offer provision from self-provisioning portal to add more storage as and when require by respective Utilities.

c) CSP should clearly differentiate its storage offering based on IOPS. There should be standards IOPS offering per GB and high-performance disk offering for OLTP kind of workload.

d) CSP should have block disk offering as well as file/object disk offering to address different kind of Project needs.

e) The CSP should retain AMI data for [x] years <*where x shall be defined based on regulatory provisions*>

2.7.3.3.6 Cloud Security Requirements

a) CSP should ensure there is multi-tenant environment and cloud virtual resources of this project are logically separated from others.

b) CSP should ensure that any OS provisioned as part of cloud virtual machine should be patched with latest security patch.

c) In case, the CSP provides some of the System Software as a Service for the project, CSP is responsible for securing, monitoring, and maintaining the System and any supporting software.

d) CSP should implement industry standard storage strategies and controls for securing data in the Storage Area Network so that clients are restricted to their allocated storage

e) CSP should deploy public facing services in a zone (DMZ) different from the application services. The Database nodes (RDBMS) should be in a separate zone with higher security layer.

f) CSP should give ability to create non-production environments and segregate (in a different VLAN) non-production environments from the production environment such that the users of the environments are in separate networks.

g) CSP should have built-in user-level controls and administrator logs for transparency and audit control.

h) CSP cloud platform should be protected by fully managed Intrusion detection system using signature, protocol, and anomaly-based inspection thus providing network intrusion detection monitoring.

2.7.3.3.7 Data Management

a) CSP should clearly define policies to handle data in transit and at rest.

b) CSP should not delete any data at the end of agreement without consent from Utility.

c) In case of scalability like horizontal scalability, the CSP should ensure that additional generated data is modify/deleted with proper consent from Utility.

2.7.3.3.8 Managed Services

a) Network and Security Management:

i. Monitoring & management of network link proposed as part of this Solution. Bandwidth utilization, latency, packet loss etc.

ii. Call logging and co-ordination with vendors for restoration of links, if need arises.

iii. Addressing the ongoing needs of security management including, but not limited to, monitoring of various devices / tools such as firewall, intrusion protection, content filtering and blocking, virus protection, and vulnerability protection through implementation of proper patches and rules.

iv. Ensuring that patches / workarounds for identified vulnerabilities are patched / blocked immediately

v. Ensure a well-designed access management process, ensuring security of physical and digital assets, data and network security, backup and recovery etc.

vi. Adding/ Changing network address translation rules of existing security policies on the firewall

vii. Diagnosis and resolving problems related to firewall, IDS/IPS.

viii. Managing configuration and security of Demilitarized Zone (DMZ) Alert / advise Utility(s) about any possible attack / hacking of services, unauthorized access / attempt by internal or external persons etc.

b) Server Administration and Management:

i. Administrative support for user registration, User ID creation, maintaining user profiles, granting user access, authorization, user password support, and administrative support for print, file, and directory services.

ii. Installation/ re-installation of the server operating systems and operating system utilities

iii. OS Administration including troubleshooting, hardening, patch/ upgrades deployment, BIOS & firmware upgrade as and when required/ necessary for Windows, Linux or any other O.S proposed as part of this solution whether mentioned in the RFP or any new deployment in future.

iv. Ensure proper configuration of server parameters, operating systems administration, hardening and tuning

v. Regular backup of servers as per the backup & restoration

vi. Managing uptime of servers as per SLAs.

vii. Preparation/ update of the new and existing Standard Operating Procedure (SOP) documents on servers & applications deployment and hardening.

2.7.3.3.9 Business Continuity Plan & Backup Services

As part of a business continuity plan, the Utility has made a business impact analysis in the event of loss of AMI applications running in the cloud and consequent loss of data to come up with a management plan for the associated risk to business operations. Central to this risk management strategy, the Utility has defined the following target objectives:

a) Recovery Time Objective (RTO): Duration of time and a service level within which a business process must be restored after a disruption in order to avoid unacceptable consequences associated with a break in continuity of service. The RTO of [4 hours] shall be met by infrastructure redundancy and failover.

b) Recovery Point Objective (RPO): Interval of time that may pass during a disruption before the quantity of lost data during that period exceeds the business continuity plan's maximum allowable threshold. The RPO of [2 hours] shall be met by a suitable backup and replication strategy of operational data / application. The RPO shall define how fast the replicated data / application can be made available to the target system after a disruption strikes.

With these two objectives, the CSP shall provide the following:

a) CSP must provide backup of cloud resources. The backup tool should be accessible

b) To perform backup and restore management as per policy & procedures for backup and restore, including performance of daily, weekly, monthly, quarterly and annual backup functions (full volume and incremental) for data and software maintained on the servers and storage systems using Enterprise Backup Solution.

c) Backup and restoration of Operating System, application, databases and file system etc. in accordance with defined process / procedure / policy. Monitoring and enhancement of the performance of scheduled backups, schedule regular testing of backups and ensure adherence to related retention policies

d) Ensuring prompt execution of on-demand backups & restoration of volumes, files and database applications whenever required.

e) Real-time monitoring, log maintenance and reporting of backup status on a regular basis. Prompt problem resolution in case of failures in the backup processes.

f) Media management including, but not limited to, tagging, cross-referencing, storing (both on-site and off-site), logging, testing, and vaulting in fireproof cabinets if applicable.

g) Generating and sharing backup reports periodically

h) Coordinating to retrieve off-site media in the event of any disaster recovery

i) Periodic Restoration Testing of the Backup

j) Maintenance log of backup/ restoration

k) CSP should provide network information of cloud virtual resources.

l) CSP must offer provision to monitor network uptime of each cloud VM.

2.7.3.3.10 Web Application Firewall (WAF) as Service

a) Cloud platform should provide Web Application Filter for OWASP Top 10 protection

b) CSP WAF should be able to support multiple website security.

c) CSP WAF should be able to perform packet inspection on every request covering the 7th layers.

d) CSP WAF should be able to block invalidated requests.

e) CSP WAF should be able to block attacks before it is posted to website.

f) CSP WAF should have manual control over IP/Subnet. i.e., Allow or Deny IP/Subnet from accessing website.

g) The attackers should receive custom response once they are blocked.

h) CSP must offer provision to customize response of vulnerable requests.

i) CSP WAF should be able to monitor attack incidents and simultaneously control the attacker IP.

j) CSP WAF should be able to Grey list or Backlist IP/Subnet.

k) CSP WAF should be able to set a limit to maximum number of simultaneous requests to the web server & should drop requests if the number of requests exceed the threshold limit.

l) The WAF should be able to set a limit to maximum number of simultaneous connections per IP. And should BAN the IP if the threshold is violated.

m) CSP WAF should be able to set a limit to maximum length of path to URL.

n) CSP WAF should be able to limit maximum size of request to Kilobytes.

o) CSP WAF should be able to limit maximum time in seconds for a client to send its HTTP request.

p) CSP WAF should be able to BAN an IP for a customizable specified amount of time if the HTTP request is too large.

q) CSP WAF should be able to limit maximum size of PUT request entity in MB

r) The WAF should be able to close all the sessions of an IP if it is ban.

s) CSP WAF should be able to ban IP on every sort of attack detected and the time span for ban should be customizable. There should be a custom response for Ban IP.

t) The Dashboard should show a graphical representation of

   i. Top 5 Attacked Websites.

   ii. Top 5 Attacking IP.

   iii. Top 5 Attack types.

   iv. Top 5 Attacked URLs.

u) For analysis purpose the Dashboard should contain following information:

   i. Number of requests to web server.

   ii. Number of attacks.

   iii. Number of Attackers.

iv. Types of error messages and on. Of error messages sent to the users.

v. Total Bytes sent during transaction

2.7.3.3.11 Database support service

a) Installation, configuration, maintenance of the database (Cluster & Standalone).

b) Regular health check-up of databases.

c) Regular monitoring of CPU & Memory utilization of database server, Alert log monitoring & configuration of the alerts for errors.

d) Space monitoring for database table space, Index fragmentation monitoring and rebuilding.

e) Performance tuning of Databases.

f) Partition creation & management of database objects, Archiving of database objects on need basis.

g) Patching, upgrade & backup activity and restoring the database backup as per defined interval.

h) Schedule/review the various backup and alert jobs.

i) Configuration, installation and maintenance of Automatic Storage Management (ASM), capacity planning/sizing estimation of the Database setup have to be provided and taken care by the AMISP.

j) Setup, maintain and monitor the 'Database replication' / Physical standby and Assess IT infrastructure up-gradation on need basis pertaining to databases

2.7.3.3.12 Factory acceptance testing:

a) The functional performance test shall verify all features specified in respective technical specifications of equipment/ systems along with cloud services & software using selected communication paths.

b) The data exchange between central systems shall also be simulated in the factory test environment. Contractor shall submit the documents for tests and test procedures for approval of Utility.

2.7.3.4 Security

Further, commercial CSPs offer cloud services to multiple consumers. In such an environment, the security controls and compliance to various standards (Including ISO 27001, ISO 27017, and ISO 27018) should be verified by third party auditors. Third-party certifications and evaluations provide assurance that effective physical and logical security controls are in place.

Although, the Cloud Service Providers (CSPs) offer assurances of effective physical and logical security controls through the third-party certifications such as ISO 27001, ISO 27017, ISO 27018, etc. and also may provide a host of security services such

as encryption, web application firewall, etc., it is the responsibility of the AMISP to define the security services that need to be implemented for their workloads depending on the nature of the applications / data hosted on the cloud.

Now a days, CSPs offer tools and features to help consumers to meet their security objectives concerning visibility, auditability, controllability, and agility. These tools and features provide basic but important security measures such as Distributed Denial of Service (DDoS) protection and password brute-force detection on CSP's accounts.

However, the following basic security features should be ensured by any CSP-

a) Strong encryption capabilities for data in transit or at rest

b) Firewalls – instance and subnet levels

c) Identity and Access Management (IAM): Control users' access to cloud services. Create and manage users and groups, and grant or deny access

d) Managed Threat Detection: Managed threat detection service that provides you with a more accurate and easy way to continuously monitor and protect your cloud accounts and workloads

e) Managed DDoS Protection: Managed Distributed Denial of Service (DDoS) protection service that safeguards web applications running on cloud.

f) Web Application Firewall: Helps protect your web applications from common web exploits that could affect application availability, compromise security, or consume excessive resources.

g) Key Management Service (KMS): Managed service that makes it easy for you to create and control the encryption keys used to encrypt your data

h) Certificate Manager: Easily provision, manage, and deploy Secure Sockets Layer/Transport Layer Security (SSL/TLS) certificates.

i) Cloud HSM: Meet regulatory compliance requirements for data security by using dedicated Hardware Security Module (HSM) appliances within the Cloud.

j) Inspector: Automated security assessment service that helps improve the security and compliance of applications deployed on cloud

k) Organizations: Policy-based management for multiple consumer accounts. With Organizations, you can create groups of accounts and then apply policies to those groups.

CSPs also offers access to additional third-party security tools (e.g., IDS / IPS, SIEM) to complement and enhance the consumers' operations in the Cloud. The third-party security tools complement existing Cloud services to enable consumers to deploy a comprehensive security architecture. These security tools on cloud are equivalent and identical to the existing controls in an on-premises environment.

The AMISP needs to review and validate the security configurations, review the notifications and patches released by the CSP and validate that the same is being taken into consideration during operations, confirm that the audit trails (e.g., who is

accessing the services, changes to the configurations, etc.) are captured for supporting any downstream audits of the projects by the finance or audit organization such as STQC.

2.7.3.5 Reporting

Further, the AMISP should insist on the following regular reporting by CSP during the contract:

a) Availability of the cloud services being used

b) Summary of alerts that are automatically triggered by changes in the health of those services.

c) Summary of event-based alerts, providing proactive notifications of scheduled activities, such as any changes to the infrastructure powering the cloud resources

d) Reports providing system-wide visibility into resource utilization, application performance, and operational health through proactive monitoring (collect and track metrics, collect and monitor log files, and set alarms) of the cloud resources

e) Auto-scaling rules and limits

f) In case of any un-authorized access, the Agency should provide logs of all user activity within an account, with details including the identity of the API caller, the time of the API call, the source IP address of the API caller, the request parameters, and the response elements returned by the cloud service. This is required to enable security analysis, resource change tracking, and compliance auditing

g) Report of all the provisioned resources and view the configuration of each.

h) Summary of notifications, triggered each time a configuration changes

i) Incident Analysis in case of any un-authorized configuration changes.

j) Summary of alerts with respect to security configuration gaps such as overly permissive access to certain compute instance ports and storage buckets, minimal use of role segregation using Identity and Access Management (IAM), and weak password policies

k) Summary of security assessment report that identifies the possible improvements (prioritized by the severity) to the security and compliance of applications deployed on cloud

l) Report on upcoming planned changes to provisioning, either possible optimizations, if any, indicating how the underutilized services can be reduced to optimize the overall spend, or required enhancements (e.g., upgrade to additional storage) to meet the service levels defined in the RFP.

2.7.4 Database

2.7.4.1 Initial Database Generation

Development Tools

The AMISP shall provide all necessary software tools for the development and maintenance of the databases required for AMI application.

This tool shall be capable of managing the entire system database. The database development software tool delivered with the system shall be used to generate, integrate and test the database. The system must support export of data into XML format.

The database development tool shall facilitate exchange of both incremental and full data in standard exchange format. The product should have facility to export and import databases from different vendors applications.

2.7.4.2 Management

The database manager shall locate order, retrieve, update, insert, and delete data; ensure database integrity; and provide backup and recovery of database files. The database manager shall generate and modify all AMI application data by interfacing with all database structures. In systems with a distributed database, the database manager shall have access to all portions of the database wherever stored.

Execution of the database manager in any server of the system shall not interfere with the on-line functions of AMI applications including the normal updating of each server's real-time database. In a primary server, database editing shall be limited to viewing functions, database documentation functions and functions that change the contents but not the structure of the database. Editing the on-line database shall not affect the operation of the primary/backup configuration.

The database manager shall include the mechanisms, in both interactive and batch processing modes, to perform the following functions:

a) Add, modify and delete database items and data sources such as data links, and local I/O.

b) Add, modify and delete application program data

c) Create a new database attribute or new database object

d) Resize the entire database or a subset of the database

e) Redefine the structure of any portion of the database.

The AMISP shall be required to provide whether they require or impose any particular hardware and database management techniques to achieve above functionality.

2.7.4.3 Tracking Changes

The database manager utility shall maintain Audit trail files for all changes made by all users (both online/off-line). The audit trails shall identify each change including date and time stamp for each change and identify the user making the change. Audit trail of past [1] year edit operations shall be maintained.

2.7.4.4 Integration

The System should support exchange of data from utility's computerized billing & collection, consumer indexing and asset mapping systems residing at different servers.

2.7.5 Display Generation, Management and Integration (Display Management and Reporting)

The AMISP shall provide necessary software tools preferably browser based for the generation, management and Integration of AMI application displays.
The displays shall be generated and edited interactively using this display generation software delivered with the system. All displays, symbols, segments, and user interaction fields shall be maintained in libraries. The size of any library and the number of libraries shall not be constrained by software. The display generator shall support the creation, editing, and deletion of libraries, including copying of elements within a library and copying of similar elements across libraries. Execution of the display generator functions shall not interfere with the on-line AMI application functions.
Displays shall be generated in an interactive mode. The user shall be able to interactively:

a) Develop display elements
b) Link display elements to the database via symbolic point names
c) Establish display element dynamics via database linkages
d) Define linkages to other displays and programs
e) Combine elements and linkages into display layers
f) Combine display layers into single displays.

All workstation features and all user interface features defined in this specification shall be supported by the display generator software.

The display generator shall support the addition, deletion and modification of segments, including the merging of one segment with another to create a new segment.

Displays shall not be limited by the size of the viewable area of the screen.

The displays shall be constructed from the display elements library. The display definition shall allow displays to be sized to meet the requirements of the AMI application for which they are used. The display generation software shall allow unbroken viewing of the display image being built as the user extends the size of the display beyond the screen size limits.

The display generator shall support the integration of new and edited displays into the active display library. During an edit session, the display generation software shall allow the user to store and recall a partial display. To protect against loss of display work when a server fails, the current work shall be automatically saved every five minutes (user adjustable) to an auxiliary memory file.

The display generator shall verify that the display is complete and error-free before integrating the display into the active display library. It shall not be necessary to regenerate any display following a complete or partial system or database generation unless the database points linked to the display have been modified or deleted.

The system shall generate reports for all the modules in user-defined formats. The system will have a graphical user interface with a capability for generating customized reports, apart from the regular ones mentioned above, as per the requirement of management and operations staff. Display of statistical data shall be presented additionally in graphical formats such as bar- graph/pie diagram etc. for convenience of analysis.

2.7.6 Software Utilities

AMISP shall supply all software utilities used to develop and maintain these software, whether or not specifically described by this Specification. The software utilities shall operate on-line (in background mode) without jeopardizing other application functions running concurrently. Utility software shall be accessible from workstations, processor terminals and servers.

2.7.6.1 Auxiliary Memory Backup Utility

Software utility, to take back-up of auxiliary memory files of server and workstation onto a user- selected archival device such as SAN, shall be installed. Backup shall be maintained for the entire duration of contract period. The backup utility shall allow for user selection of the files to be saved based on:

a) Server and workstation

b) File names (including directory and wildcard designations)

c) File creation or modification date and time

d) Whether or not the file was modified since the last backup.

Further a utility for taking image backup of auxiliary memory files of the Servers and workstations shall be provided. The utility shall allow restoration of the servers/workstation from this image backup without requiring any other software. An image backup of the as built system of each of the Servers and workstations shall be provided on a user-selected archival device such as SAN, which shall be used to restore the system. Automatic full or incremental back up capability of selected systems at user defined intervals shall be provided. It should be possible to restore or recover any software/system at a selected time from backup.

2.7.6.2 On-Line Monitoring Diagnostics Utility

On-Line monitoring diagnostic programs shall be provided for verifying the availability of the backup equipment and for limited testing of devices without interfering with on-line operations of AMI application system or the failover capability of the devices.

Redundant communication line interface equipment shall be tested by periodically retrieving data over these lines and checking for the ability to communicate with the redundant channel for any errors.

Designated backup server(s) and associated auxiliary memories shall be automatically tested for proper operation to ensure they are ready if needed for a failure over contingency. Any failure to perform diagnostic functions correctly shall cause an alarm to be issued.

2.7.6.3 Data Exchange Utilities

Facility of data export and import between this system and external systems shall be provided through web services.

2.7.6.4 Other Utility Services

AMI Application management shall include the following utility services:

a) Loading and storage of information from labelled portable media storage units as dictated by the requirements of this specification.

b) Preparation of .pdf output for the displays/reports available in the AMI Application system. It should also be possible to export all the reports to any MS-Office format.

c) Displays and Reports for Web server -The AMISP shall provide utilities for preparing displays and reports suitable for Web publishing. These utilities shall be used to generate, all required displays and reports from the system displays and reports, automatically (without requiring rebuilding).

d) Online access to user and system manuals for all software products (e.g., Operating System and Relational Database Software) and AMI applications shall be provided with computer system

e) Antivirus Software - All computers and firewalls shall be provided with the latest antivirus software as on date of supply. The antivirus software shall have the capability of having its virus definitions updated from time to time. The AMISP shall be responsible for the maintenance & update of the antivirus software during the contract period.

f) Software Upgrade-The AMISP shall be responsible for the maintenance & update of the patches and signatures of operating system, applications (AMI Applications) system and Web based System up to the contract period.

g) Automated patch management and anti-virus tools shall be provided to expedite the distributions of patches and virus definitions to the system using an orchestration facility.

These tools should consider the possibility to use standardized configurations for IT resources.

2.7.7 Cyber Security – General Guidance

Cyber security governance problems are unique as well as evolving therefore, they cannot be dealt with a traditional approach. For establishing secure and resilient Smart Meter systems, a standardized cybersecurity framework should be adopted by the AMISP in consultation with the Utility and relevant stakeholders. The key elements of the cyber security framework must include:

a) Differentiation of stakeholders into broad categories to aid in proper distribution of responsibilities among stakeholders and avoid overlapping

b) Defined set of responsibilities for each stakeholder group. As a result, the decision-making process is streamlined, and proper management hierarchy is established

for handling the reported cyber-attacks. The roles and responsibilities are divided into two groups:

i. **Cyber – strategy and governance:** The responsibilities under this group relates to the policy and decision-making aspects of cyber security framework

ii. **Cyber security – risk, operations and compliance:** This group comprises of responsibilities relating to the operational parts of implementing cyber security policies

c) Standardization of security practices and abundant guidance from knowledge bodies while implementing security controls and processes. There are multiple global security standards and Indian standards that are relevant in context of underlying technologies used in smart meters:

i. National Institute of Standards and Technology (NIST) has developed a framework for Cyber Physical Systems (CPS). The Framework provides a taxonomy and organization of analysis that allow the complex process of studying, designing, and evolving CPS to be orderly and sufficiently encompassing.

ii. Department of Electronics and Information Technology (DeitY), Government of India has developed a National Cyber Security Policy. It aims at protecting the public and private infrastructure from cyber- attacks. The policy also intends to safeguard "information, such as personal information (of web users), financial and banking information and sovereign data".

d) Cyber security incident management: The ISO/IEC Standard 27035 outlines a five-step process for security incident management, including:

i. Prepare for handling incidents.

ii. Identify potential security incidents through monitoring and report all incidents.

iii. Assess identified incidents to determine the appropriate next steps for mitigating the risk.

iv. Respond to the incident by containing, investigating, and resolving it

v. Learn and document key takeaways from every incident

Notwithstanding the measures suggested above, the following guidelines/strategies shall be taken care of by the AMISP for making the entire AMI system including the NOMC immune to Cyber Attacks.

a) All the Hardware, OS and application software shall be hardened.

b) Application, scanning and hardware scanning tools shall be provided to identify vulnerability & security threats.

c) Data shall be encrypted at system/device/technology level.

d) Network Zoning shall be implemented as per the proposed architecture. However, the AMISP may suggest other methods of network architecture without compromising the security of the System.

e) Internal user shall be allowed to access all adjacent zones. However, they will not have access to remote network zone.

f) While procuring cyber security items testing must be done and the system must be secure by design.

g) Residual information risk shall be calculated by AMISP and same shall be submitted to the Utility for approval.
h) All default user id & passwords shall be changed.
i) All log in/out and cable plugs in/ out shall also be logged in Central Syslog server.
j) Penetration & Vulnerability assessment test from CERT-IN certified auditors during SAT & Operations and Maintenance period.
k) Auditing by third party during SAT and annually during operations and maintenance period shall be in the scope of AMISP.
l) As the computer system in NOMC has access to external environment the AMISP shall document and implement Cyber Security Policy/Plan in association with the Utility to secure the system.
m) Latest Cyber Security Guidelines issued by CERT-In specified at http://www.cert-in.org.in/, Ministry of Power (including "Testing of all equipment, components, and parts imported for use in the power Supply System and Network in the country to check for any kind of embedded malware /trojans/ cyber threat and for adherence to Indian Standards – Regarding" vide Order No. No.9/16/2016-Trans-Part(2) published by Ministry of Power, Government of India dated 18 November 2020 and amended from time to time) or any other competent authority shall be followed.
n) AMISP shall adhere with the appropriate security algorithm for encryption and decryption as per established cyber security guidelines. For smooth functioning of the entire system, it is essential that the AMISP shall provide in the form of a document enough details of such algorithm including the mechanism of security key generation to the Utility. In case of proprietary or secret mechanism, the same shall be kept in a secured escrow account.
o) All operations and maintenance, including upgrades, patching, and configuration, must be conducted from facilities located within India apart from ensuring data residency within India.
p) Remote access to HES/ MDMS must be strictly controlled, secured, and provisioned with Multi-Factor Authentication (MFA).

REC vide letter no. REC/PMD (RDSS)/2025-26/21 dt. 05.05.2025 , please refer to the Cyber Security testing provision for Smart Metering Projects under RDSS:

Rahul Dwivedi, IAS
Executive Director

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REC

No. REC/PMD/2025-26/ 21 Dated: 05/05/2025

To,

The Additional Chief Secretary/Principal Secretary/Secretary (Energy/Power) of all States and UTs,

MDs of all Distribution Companies (DISCOMs),

Subject: Cybersecurity Testing Provisions for Smart Metering Projects under RDSS.

Respected Madam/Sir,

As part of our ongoing efforts to enhance the reliability, efficiency, and security of our nation's power infrastructure, it is imperative that we address the growing concerns related to cyber security in our smart metering projects under the Revamped Distribution Sector Scheme (RDSS). With the current smart meter installations across India crossing 27 million mark and installations picking up pace, it is crucial that we implement robust cyber security measures to safeguard our systems against any malicious activities.

As per the deliberations held with multiple stakeholders to finalise the various tests w.r.t cyber security features to be tested under various phases,CSIRT–POWER has recommended that the cyber security provisions attached as **Annexure-I** herewith shall be tested during FAT/FIT/SAT of the Smart Metering Projects apart from other Cyber security features mentioned in the SBD.

In view of above, all power utilities are requested to prioritize the inclusion of comprehensive cyber security testing provisions including the provisions recommended by CSIRT-POWER in their smart metering projects under RDSS as per the stage of the project.

I trust your esteemed organization will give this matter the attention it deserves and take the necessary steps to implement these measures in your smart metering projects.

Thank you for your cooperation and commitment to enhancing the security of our nation's power infrastructure.

Yours sincerely,

Rahul Dwivedi
Executive Director (PMD)

REC Limited
(Formerly Rural Electrification Corporation Limited)
A Government of India Enterprise

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f RECLimitedIndia RECLimited REC Limited

Smart Meters and the AMI system shall be tested for cyber security features as specified in AMISP SBD document across various phases of testing, the scope of which shall include but not limited to the following

Cyber security Testing Requirements during FAT/FIIT/SAT

S. N.	Device/ System	Test	Validation/Testing Approach
Factory Acceptance Test (FAT)			
1	Smart Meters	Data Encryption: Verify encryption mechanisms for data transmission from meters to the HES. Requirement mentioned in AMISBD-Data shall be encrypted at system/device/technology level. (2.7.7 Cyber Security – General Guidance last paragraph (c))	Test Certificate/Report of IS16444/ IS15959 standards compliance to be verified for **Data Encryption** compliance at Smart Meter level **during FAT.**
2	Smart Meters	Access Control: Check for secure access controls, role-based access features, requirement mentioned in the document (2.7.8 Data Privacy d(i)).	Test Certificate/Report of IS16444/ IS15959 standards compliance to be verified for both local and remote interface, Access Control compliance at Smart Meter level **during FAT.**
3	Head End System(HES)	Authentication and Authorization: requirement mention under-2.2.3 Network Protection & Security -Secure Access Controls and Authorization Controls.	To be verified **during FAT.**
4	Meter Data Management System (MDMS)	Data Privacy Controls as mentioned in 2.7.8 Data Privacy	Validate "Privacy by Design"approved by utility as per SBD requirements **during FAT**.
5	Meter Data Management System (MDMS)	Role-Based Access Control (RBAC): Verify RBAC configuration to control user access as per requirement mentioned in 2.2.3 Network Protection & Security (e) GUI to provide role-based access based on user identity and user role.	To be verified **during FAT**.
Field Installation and Intergration Test (FIIT)			
1	Smart Meters	Audit Logs: 'All log in/out and cable plugs in/ out shall also be logged in Central Syslog server. (2.7.7 Cyber Security – General Guidance last paragraph (i))	The logs/events including write access from local interface are tested as part of IS 15959 testing standards, and such transaction logs are automatically pushed to the HES server as well, thus the said testing requirement to be verified for Head End Systems instead of Smart Meters at **FIIT stage** .
2	Head End System(HES)	Data Encryption: 'Data shall be encrypted at system/device/technology level'- (2.7.7 Cyber Security – General Guidance last paragraph (c))	Data Encryption in Transit (during communication to/from HES) to be verified during FIIT Encryption of data having PII association while being at rest shall be ensured against said testing requirement **in the FIIT stage .**
3	Head End System(HES)	Audit and Compliance Logging: Ensure logging capabilities are operational to track access and modifications. All log in/out and cable plugs in/ out shall also be logged in Central Syslog server. (2.7.7 Cyber Security – General Guidance last paragraph (i))	To be verified **during FIIT**
4	Meter Data Management System (MDMS)	Audit and Compliance Logging: Confirm that MDMS logs all access and data modifications. Ensure logging capabilities are operational to track access and modifications. All log in/out and cable plugs in/ out shall also be logged in Central Syslog server. (2.7.7 Cyber Security – General Guidance last paragraph (i))	To be verified **during FIIT**
5	Meter Data Management System (MDMS)	Data Encryption: Verify encryption for data handled by the MDM. Requirement mentioned in AMISBD-Data shall be encrypted at system/device/technology level. (2.7.7 Cyber Security – General Guidance last paragraph (c))	To be verified **during FIIT**
6	Integrated AMI	End-to-End Encryption: Verify encryption from meters to MDMS to secure data transmission. (2.7.7 Cyber Security – General Guidance last paragraph (c))	To be verified **during FIIT**
7	Smart Meters	Audit Logs-All log in/out and cable plugs in/ out shall also be logged in Central Syslog server. (2.7.7 Cyber Security – General Guidance last paragraph (i)).	The logs/events are tested as part of IS 15959 testing standards, and such transaction logs are automatically pushed to the HES server as well, thus the said testing requirement to be verified for Head End Systems instead of Smart Meters **at FIIT stage** .

Site Acceptance Test (SAT)			
1	Smart Meters	Firmware Security: Test secure firmware update capabilities to prevent unauthorized modifications. Requirement mentioned in the document (Remote Firmware upgrade cybersecurity as per IS 15959)	**To be tested at SAT stage.**
2	Smart Meters	While procuring cyber security items testing must be done and the system must be secure by design'. (2.7.7 Cyber Security – General Guidance last paragraph (f))	**1. For Smart Meters:** The Test Reports for IS16444/ IS15959 standards may be verified. **2. For HES and MDMS:** The cybersecurity related testing to be carried out during the cybersecurity audit by CERT-IN empanelled auditor and the certificate to be provided accordingly before Go-live.
3	Meter Data Management System (MDMS)	Preexisting vulnerabilities: as per requirement mentioned - 2.7.7 Cyber Security – General Guidance last paragraph (b) Application, scanning and hardware scanning tools shall be provided to identify vulnerability & security threats.	To be demonstrated as part of Cyber Security Audit **before Operational Go Live during First SAT**
4	Integrated AMI	Pre-existing Vulnerability Management: Conduct vulnerability assessments on each component of the integrated AMI system. As per 2.7.7 Cyber Security – General Guidance last paragraph (b) Application, scanning and hardware scanning tools shall be provided to identify vulnerability & security threats	Detection of pre-existing vulnerabilities to be carried out in the deployed applications as part of Cyber Security Audit **before Operational Go Live during First SAT .**
5	Integrated AMI	Secure Integration: Test secure integration channels between MDMS, HES, and any third-party systems.	Secure integration of complete AMI system to be tested as part of Cyber Security Audit **before Operational Go Live during SAT.**
6	Smart Meters	Encryption in Real-Time Transmission: Confirm encryption effectiveness in real operational settings for data sent to the HES.	Test Certificate/Report of IS16444/ IS15959 standards compliance to be verified for Data Encryption compliance at Smart Meter level **during SAT**
7	Smart Meters	Firmware Update Verification: verification of secure firmware updates in a live environment to confirm protections against unauthorized updates. Requirement mentioned in the document (Remote Firmware upgrade cybersecurity as per IS 15959).	To be tested **at SAT stage**.

8	Smart Meters	2.7.7 Cyber Security – General Guidance last paragraph (h) All default user id & passwords shall be changed.	To be tested **at SAT stage.**
9	Head End System(HES)	Real-Time Data Transfer Security: Confirm secure data transmission between HES and other components in the live environment.	To be validated during CERT-In cybersecurity **before Operation Go live .**
10	Head End System(HES)	System Hardening: Ensure unnecessary services, ports, and default passwords are disabled as part of system hardening. (2.7.7 Cyber Security – General Guidance last paragraph (a)). All the Hardware, OS and application software shall be hardened.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**
11	Head End System(HES)	2.7.7 Cyber Security – General Guidance last paragraph (h) All default user id & passwords shall be changed.	To be validated **at SAT stage.**
12	Meter Data Management System (MDMS)	Data Privacy in Operation: Validate that data privacy controls remain effective in field conditions, with real-time masking and anonymization.	To be validated **at SAT stage.**
13	Meter Data Management System (MDMS)	RBAC Effectiveness: Test RBAC to confirm that only authorized personnel have access to MDMS data in operational settings.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**
14	Meter Data Management System (MDMS)	Data Privacy Controls as mentioned in 2.7.8 Data Privacy	To be validated **at SAT stage.**
15	Meter Data Management System (MDMS)	System Hardening: Ensure unnecessary services, ports, and default passwords are disabled as part of system hardening. (2.7.7 Cyber Security – General Guidance last paragraph (a)). All the Hardware, OS and application software shall be hardened.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**
16	Integrated AMI	Secure Integration: Test secure integration channels between MDMS, HES, and any third-party systems.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**
17	Integrated AMI	API cybersecurity – against requirement of 3.4 Integration with national level reporting platform where MDM shall have an out-bound interface to facilitate data transfer through API-based model/ service bus.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**
18	Integrated AMI	Verification of cloud cybersecurity provision: The cybersecurity requirements mentioned under 2.7.3.1 General Conditions should be tested during SAT.	To be validated during CERT-In cybersecurity Audit **before Operation Go live.**

Further, any directive or amendment issued by the MoP/REC/PFC and other Government bodies till date shall also been applicable to this AMISP tender.

2.7.8 Data Privacy

AMISP should describe ensure that the system is compliant with the applicable provisions of the "Reasonable security practices and procedures and sensitive personal data or information Rules, 2011 (IT Act)" and "Data Protection and Digital Privacy (DPDP) Act, 2023 as well as shall be committed to work with Utility for compliance to Personal Data Protection requirements. In this regard, the general elements of the data privacy framework may include:

a) The Utility shall be the sole custodian of the Smart Meter data. The AMISP and its contracted vendors will have limited need basis access to the data. In case of pre-mature termination or at the end of contract, the AMISP and the contracted vendors should relinquish all access to the data and transfer the same to the Utility.
b) AMISP is required to prepare and submit a "Privacy by Design" document to the Utility which details out all the policies, practices, processes and technologies employed to manage, and process the Smart Meter data in a secure manner. This

should also include the details on methods of anonymization applied to the personal Smart Meter data based on data types defined below:

i. Aggregated Data: No identification individually and at neighborhood level unless explicitly required to report
ii. Anonymized Data: A data set which has individual Smart Meter data but without any personally identifiable information like consumer name, account number, address etc.
iii. Personal Data: A data set with Smart Meter data tagged with personally identifiable information.

c) AMI system should enable the Utility to get the consumer consent on sharing and processing of Smart Meter data based on following criteria
   i. Consumer consent not required
      1) If any type of Smart Meter data is processed by the Utility or a third party on behalf of Utility for the purpose of generating bills, identifying theft, network planning, load forecasting or any related activities that can enable the Utility to fulfill its duty as a licensee.
      2) If any type of Smart Meter data is requested by the law enforcement agencies.
      3) If aggregated or anonymized data is shared with not-for-profit academics, policy research, civil society entities for research that can benefit the sector in general.
   ii. Opt-out consumer consent
      1) If any type of smart meter data is shared with or processed by any third-party commercial entity to provide services other than as enabled by regulation. In this case, the AMI system should enable the Utility to conduct the following consumer consent process
         - Consumer should be notified and given a time to opt-out
         - Consumer should have the right to change his/her option through the app/web account/direct communication to Utility.
d) AMI system should enable following Data sharing protocol
   i. Data should be shared by providing finite and secure access to the system. The access can be modified or terminated as need be.
   ii. Sharing of part/full database shall be subject to review and consent of Utility.
e) All data sharing shall be recorded and periodically submitted to utility for review / regulatory requirement
f) AMISP should have a data breach response plan and should communicate to the utility and consumers in case of any data breach from AMI system
g) AMISP is responsible to conduct 3rd party data privacy audit at least once every year based on evaluation criteria pre-identified by the Utility in consultation with data experts. The audit report should be made available to Utility. AMISP to take necessary actions on audit observations in consultation with the utility.

3. AMI System Integrations

The AMISP's core deliverables are the MDM integration, the HES, the NMS and the smart field devices (DCUs/Routers and Smart Meters). Hence the system integrations shall comprise of the following,

i. HES with field devices (DCUs/Routers and smart Meters)

ii. MDM with

   a. HES

   b. Billing and CIS

   c. Other legacy IT/OT systems as required by the utility

   d. National level Reporting Platform to come up in future

3.1 MDM Integrations with Utility IT/OT Systems

The MDM 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:

a) Billing, CIS, IVRS, CRM systems
b) Legacy Data Collection Systems
c) HHU/CMRI/Bluetooth enabled reading or manual reading system etc.
d) Consumer Portal/ App
e) GIS
f) SCADA, OMS
g) PLM, DRMS
h) Asset Management System
i) Work Force Management System
j) DT Monitoring System
k) EVSE

The details of the existing integration infrastructure, including specificity in implementation, interface and services available for each of the existing enterprise applications which the AMISP has to integrate with the AMI system, has been provided in Annexure L of this Section.

For those IT/OT systems which the Utility have planned in future, the AMISP shall publish document on available standard interfaces to enable their integration.

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

MDM shall interface with these IT/OT systems on standard interfaces. The data exchange models and interfaces shall comply with CIM-XML-IEC 61968-9 / IEC 61968-100 / Web Services / MultiSpeak v3.0. MDM solution shall be ESB-SOA enabled.

The aim of the above interface standards is to ensure generic two-way interfacing of the MDM with other applications. This effort shall be guided by the methodology whose details are outlined in the approach paper set out in Project Implementation Plan.

3.2 HES Integrations with Field Devices

HES shall export all meter data to MDM and pass control commands from MDM. HES should conform to IEC 61968-9 as well as support CIM 2.0 / MultiSpeak v3.0 standards. It may use any other standard interfaces as outlined in the approach paper, submitted as part of project implementation plan, for integrating with the MDM. In case, utility has implemented any Service Oriented Architecture (SOA)/ Enterprise Service Bus (ESB) architecture, the data exchange to and from HES shall be through this ESB. The details of its ESB in the templated provided in Annexure G.

The HES shall follow the integration protocol established by IS 15959 (DLMS-COSEM) and make use of ACSE and xDLMS services to communicate with southbound field devices (DCUs and Smart Meters) irrespective of the physical communication layer.

3.3 Integrated Network Management System

The Network Management function specific to the HES shall be integrated with overall Data Centre level NMS module for easy monitoring, analysis and reporting

3.4 Integration with national level reporting platform

The AMI system put in place should provide a seamless exchange of data with a national level data portal without any manual interface including NFMS. In this regard, the MDM shall have an out-bound interface to facilitate data transfer through API-based model/ service bus to a central platform as and when made available. An indicative data list will be provided by the Utility for sharing with the national level reporting platform during contract period. The technical interface (such as web services, published APIs, DB table schemas etc.) for enabling this integration, will be defined accordingly. However, the AMISP needs to ensure the following:

a) Any reports / analytics / graphics from system would provide opportunity to anonymize/ remove traceability to individual consumers to maintain privacy

b) Reports/data made available in the public domain for public consumption should be always sufficiently aggregated/ anonymized so as to protect consumer privacy.

4. Consumer Indexing

Consumer indexing will be carried out/verified for the incoming population of smart meters for end-to-end metering at contiguous electrical locations in the selected AMI Project Area and for dispersed metering of DTs/ Feeders at non-contiguous electrical locations in the selected AMI Project Area. The responsibility for consumer indexing for dispersed metering at non-contiguous electrical locations in the selected AMI Project Area shall lie with the Utility. For this a door-to-door survey shall be required for each meter installed and tallying it with the consumer related records (physical, electrical and commercial) available with the Utility. In establishing the linkage of the consumer meter to the electric network, the asset (including the meter) codification as used by the utility GIS (or as per standards set by the utility) shall be strictly followed. If the GIS asset database is available, the verified consumer data shall be uploaded into the GIS database by the Utility for a single point of truth, presentation and secondary evaluation. If GIS is not available, then the AMISP is required to create a standalone consumer indexing database. This database of electrical indexing shall have the following broad parameters:

- Energy Meter name plate details
- Meter clustering if any
- Sealing Status
- Installation Date
- Start Reading (New Meter) and Last Reading (Old Meter)
- Geo Location
- Customer Name
- Username
- Postal Address / Telephone / Email
- Sanctioned Load
- Pole/DT/Feeder Code

Either of the following checks may be done to establish the correctness of the indexing database. The selection of these methods or any other equivalent method shall be at the sole discretion of the AMISP vendor.

1. Correlation of DT wise energy loss with load flow studies; or
2. Selective demand trip of DT to identify meters under outage

4.1 Scope of Work for CI

a. Obtaining details of existing consumer indexing available with the utility as a starting reference point.
b. Capturing of all the mandatory attributes mentioned in the CI format.
c. Updation of consumer details within the geographical boundary covered by the utility as part of the scope. The details of new/shifted consumers shall be provided by the Utility.
d. Consumer indexing for added/shifted consumers based on the ledger/field survey with physical verification of the existing consumer database. Modification/correction of consumers based on electrical system with the help of Utility.
e. Capturing of complete attributes of the consumers; viz, consumer code present in utility legacy system, consumer name, address, mobile number, asset id of source of

power supply, service type(poles, feeder/pillar box, OH/UG), meter make, meter location, meter serial number etc.

f. Capturing of GPS co-ordinates (Latitude/Longitude) of consumer premises through the Mobile Application (developed by Implementing Agency) which must have facility of capturing Latitude/Longitude. During the CI, Field Team must click on the location and Mobile App must automatically take the Latitude/Longitude of the consumer premises.
g. Carrying out QA/QC on the collected consumer data.
h. Submission of data of the consumers in computerized file to the Utility. The file shall have the facility to edit, update and create data. Further, (2) hard copies of the deliverables, for approvals/comments by the concerned officer(s), shall also be submitted by the implementation agency.
i. Getting the CI data verified/validated by the concerned Officers/Authorities. The implementation agency is expected to obtain approval from Competent Authority. The implementation agency shall obtain the acceptance/take over certificate by the concerned Officers/Authorities.
j. Surveyor/Field Team shall walk along with the line and identify the consumers to whom supply is released from each pole / service pillar and identify the Distribution Transformer from where each Consumer is fed.
k. For the purpose of data validation and quality check, the sample size would be 10% of the total consumers under the assignment. The error toleration level shall be 5% of the sample size.
l. In case of comments by the concerned Officers/Authorities, the same would be incorporated and resubmitted by the SI. It will be the responsibility of the SI to ensure that Consumer data collected does not become stale during the course of the execution of the project.

After meter installation, details of consumer connections, such as consumer identification no., meter ID, its hardware & software configuration, name plate details, make, type i.e. 1 Phase or 3 Phase shall be automatically updated in the AMI system. The information would also be updated on the consumer portal and app for providing information to consumers.

4.2 Consumer Indexing & Meter Installation APP: Consumer Indexing & Meter Installation should be carried out through a robust CI/MI Application for better tracking and record of field activities.

Consumer Indexing (CI): Site Survey of electrical device and conduct door to door survey to obtain consumer details by consumer indexing (CI), we can find Division/sub division wise location of the consumer through which feeder, or transformer, or circuit number and or pole consumer is being supplied. Mobile App should have functionality of capturing the asset condition, Meter Condition, Meter Height, Meter Location (Inside/outside), Cable

Type (un-armoured /armoured), Consumer Connection Status (Active /IDF /TD /PD), Others (Consumer Denial /Door Locked) and other required information through automated tool or manual screens, most important Longitude & Latitude (auto-populated) of location using Google map.

Meter Installation (MI): Smart meter installation on the premises as per order received from organization. Meter installation is the process where Implementing Agency needs to install smart meter physically on the consumer premises based on the order finalized. There may be different scenarios i.e. New Service connection, old meter change, smart meter to smart meter change, Net meter, IDF, Load Enhancement etc. The provision to capture the details against each case as mentioned above to be provided in the application for paperless activity and the consumer/ old meter information/new information data should be seamlessly updated to the AMI/Utility System.

Inventory Management: Inventory Management is to have readily availability of stock. All inventory of Meters devices and its accessories are maintained in warehouse and system will provide the actual inventory status of all devices. This system would be real-time or offline integrated with meter installation system or other system. Selection of Meter or Asset from Inventory for installation, meter or device will be automatically deduct the balance of asset from the inventory. In case of Smart Meter to Smart Meter replacement, inventory will be added as defective and as well as deducted from the inventory management with meter status (in case of faulty) with a maker and checker concept.
AMI Implementing Agency shall maintain the inventory of all the meters in designated warehouse, maintenance and security including full responsibility for protection from theft and fire. Meter Inventory Management and Warehousing to be maintained by AMI Implementing Partner on real-time basis.

Mobile application for Consumer Information, Meter Installation & Meter Advising (MC)

During consumer indexing and meter installation implementation agency will use android/iOS based mobile application. Consequently, following are the major scope of work for installation in the field.

- Consumer Indexing team (for capturing consumer's information)
- Documentation and Approval of prescribed format for Consumer indexing & Smart Meter installation and sealing information.
- Resource deployment and Responsibility allocation
- Quality and Safety Assurance during field work

5. Consumer Engagement

5.1 AMISP shall develop a consumer engagement plan for smooth implementation of AMI system. The plan at the minimum should include consumer engagement activities to be undertaken at Utility's headquarter, division and sub-division level as well as communication and media plan for the same. The plan should include educating consumers about the pre-paid recharge mechanism, benefits of pre-paid meters, potential usage of Smart Meters data for consumers, etc;

5.2 Utility shall provide necessary inputs for developing a comprehensive consumer engagement plan;

5.3 The Utility shall implement consumer engagement plan with support of AMISP. This would include running media campaign to raise awareness and counter myths around smart metering prior to installation, etc.

6. Analytics and Reports

6.1 Analytics including Energy Audit

The MDM shall have analysis capability based on configurable business rules including but not limited to the following:

a) **Energy Audit:** Perform DT/Feeder/ Sub-Division/ Division/ Circle wise energy audit for configurable period. These energy audit reports shall clearly bring out the technical and commercial losses through detailed analysis of supply side energy data and corresponding aggregated consumption data of connected consumers. In this analysis it must factor in data of energy export from net-metered consumers. The automated audit should include but not limited to:

   I. A daily automatic feeder loss (Feeder Head reading minus summation of all DT meters readings)
   II. Automatic LT Energy loss (DT meter reading minus summation of readings of all those consumer meters served by the selected DT) would be reported
   III. Billing and collection efficiency
   IV. Identify the top [X] best as well as worst performing feeders and DTs

b) Display consumption/load profiles by configurable period (15/30 min, hour, day, month, year etc.) day type (weekday, weekend, holiday, festival wise etc.) and by tariff, consumer type (hospitals, schools, govt. offices, multiplexes, commercial, residential, industrial etc.), or any user specified collection of meters.

c) Generate peak & off-peak load patterns by aggregating all loads of consumer group/consumer type/DT/Feeder over configurable period/day type.

d) Perform load analysis for different groups and categories of consumers in different weather conditions.

e) Ability to provide the data to load forecasting, load research or demand response applications (based on use cases provided in Annexure H) and perform error management such as missed reads and intermittent meter reads before sharing data with load forecasting, load research or demand response

f) Ability to configure the system to effectively visualize consumption trends, identify unusual patterns, and visualize load analysis to understand which assets are being over utilized.

g) Analysing data to identify new patterns of usage, Setting fraud alert / transformer overload alerts / demand – supply gap alert etc.

h) Ability to receive and store outage and restoration event data from Smart Meters and outage systems and to log all such events for analysis and also support calculation of compensation payments for sustained outages. Five reliability indices shall be calculated,

   i. System Average Interruption Duration Index (SAIDI), which is sum of all consumer interruption durations in a given period over total number of consumers served.

ii. System Average Interruption Frequency Index (SAIFI), which is the total number of sustained interruptions in a given period over total number of consumers served.

iii. Consumer Average Interruption Duration Index (CAIDI), which is sum of all consumer interruption durations in a given period over the total number of sustained interruptions in that given period

iv. Consumer Average Interruption Frequency Index (CAIFI), which is the total number of sustained interruptions in a given period over the total number of distinct consumers interrupted in that given period

v. Momentary Average Interruption Frequency Index (MAIFI), which is the total number of consumer interruptions less than the defined time (1 or 5 minutes) over the total number of consumers served

These reliability indices shall be calculated for each month, for individual feeders and aggregated annually for the whole utility. The source data for outage shall be last gasp / first breath messages from DT/Feeder level meters or the power outage/restoration events logged by these meters. These computations shall be independent of similar computations made by any OMS application.

i) Ability to alerts on DT/ Feeder level overvoltage & back-to normal event and under-voltage and back-to-normal events. Based on these alerts the system should calculate the duration in which the DT/Feeder remained outside the nominal zone of defined voltage. Similar calculations should be allowed for power factor and current unbalance.

j) Identify & visualize poor performing assets such as feeder/DT on multiple criteria such as energy losses, outage duration etc. through appropriate colour coding depending on severity thresholds.

k) Analyse data of net-metering consumers to identify patterns of energy export to grid on hourly/weekly/monthly/yearly basis.

6.2 Reporting Function

The Report function shall enable the Utility to deliver reports in standard digital format such as PDF, Excel, etc. All queries for report generation shall be made through user driven drop down menu through GUI of Utility user interface (refer to Clause 2.5.1 of this Section for more details). The AMISP shall provide example queries to support internal report generation needs. The GUI shall have provisions to set up or change report delivery to configurable email addresses, network file directories, ftp sites or printer systems without modifying source program code and without any proprietary language skills.

6.2.1 The MDM shall generate following reports (an indicative list only). Utility may request for additional reports as well during the contract period.

i. Daily data collection report

ii. Usage exceptions

iii. VEE validation failures

iv. Missing interval Read date and times (on hourly, daily, weekly & monthly basis) and their trends

v. Physical meter events (install, remove, connect, disconnect) & meter reset report

vi. Meter flags

vii. Meter inventory

viii. Defective meters

ix. AMI performance measurements

x. Threshold exception

xi. DT condition monitoring

xii. MIS reports and analytical reports including but not limited to following:

1) Payment collection summary and details in a day/week/month/year or as per user selectable period and trends

2) Number / list of disconnected consumers due to inadequate prepaid account balance

3) Prepaid consumers running low on account balance

4) Connected consumers

5) Critical notifications sent to consumers

6) Revenue analytics as per consumption pattern of consumers (in terms of money and energy units). This shall also include automatic compensation payments by Utility to consumers for sustained outages, if implemented

7) Data-driven Analytics reports by leveraging AI/ML based technologies

6.2.2 Following high level reports for Utility Management shall be generated automatically at specified frequencies to help management with business decisions. <*Below is an example of reports2 that may be generated. These reports should be defined and agreed by the utility*>

Category	Report	Frequency
Energy Audit	Energy Audit Report (DT/ Feeder / Sub-Division/ Division/ Circle wise) in contiguous electrical locations: • A daily automatic feeder loss report (Feeder Head reading minus summation of all DT meters readings) • Automatic LT Energy loss report (DT meter reading minus summation of readings of all those consumer meters served by the selected DT) would be reported • Billing and collection efficiency • Identify the top [X] best as well as	Daily, Monthly and User Selectable Time Period with configurable near real time alerts for exceeding defined loss threshold

[2] These reports shall be generated provided the corresponding DT/ Feeder data is available as part of the AMI system being installed.

Category	Report	Frequency
	worst performing feeders and DTs	
Reliability Indices	SAIFI and SAIDI; CAIFI and CAIDI; MAIFI of the feeder(s) and connected consumers would be tracked to measure the improvement in the same overtime and establishing reference levels	Daily, Monthly and User Selectable Time Period
Load Management	DT Loading (Categorize DT as overloaded, optimally loaded, near optimal, under loaded)	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
	Load recording (Consumers): Actual consumption recorded higher than the sanctioned load identifying the top [X] consumers	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
	Load Management Report (Identify top overloaded DTs) and load rise trend	Monthly and User Selectable Time Period
POWER QUALITY	Voltage Deviation Index and Frequency Deviation Index (DT/ Feeder)	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
	Low Power Factor (DT/ Feeder)	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
	Meter Current Unbalance (DT/ Feeder)	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
Loss Analytics	Tamper Alert: as per IS 15959 Part 2	Daily, Monthly and User Selectable Time Period with configurable near real time alerts
	Comparison Consumption (system used to detect & track theft suspects)	
	Consumption lower than the expected pattern (pattern of previous year applied to the monthly average) or monthly average	
Management Summary Report (Dashboards)	Summary report on top [X] high loss DTs/ Feeders, top overloaded DTs/ Feeders, Top feeders/ DTs with most outages (number and duration), Top feeders with most power quality issues (over voltage, under voltage, current unbalance, out of band frequency), DTs with high failure rate	<Monthly and User Selectable Time Period>

These reports shall be generated for both contiguous as well as non-contiguous electrical locations. However, for non-contiguous electrical locations as mentioned in Clause 1.2 (C), all relevant reports shall be generated as per scope except for those that are not technically feasible for example, consumer related reports like revenue analytics, load recording of consumers etc.

6.2.3 The utility interface should have ability to generate reports on critical and non-critical information received from the HES to the MDM as per Clause 2.3.3 of this Section.

6.2.4 The utility interface shall have feature to generate report related to SLAs being mentioned in Clause 7.7 of this Section.

6.2.5 Ability to generate various analytics reports as per Clause 6.1 of this Section.

6.2.6 AMISP shall submit a detailed report on data being shared as per Clause 2.7.8 on a yearly basis. AMISP shall submit detailed report on any exception in general data sharing on monthly basis. Further, AMISP shall also submit a detailed report for any other time period as requested by utility

7. Operation and Maintenance

7.1 Scope and period

The operation, maintenance, and support services start after the successful completion of the operational go-live of the system as per Clause 9.6 of this Section. Operation, maintenance and support services shall extend up to end of Total Meter-months from Operational Go-Live. The scope of work under operation and maintenance services shall include,

a) Comprehensive maintenance of all the software (including licensing, version upgrades if any and annual technical support cost)
b) Comprehensive maintenance of all hardware at the Operation and Monitoring Centre, along with field devices (like Smart Meters, DCUs etc.) provided by AMISP under the project
c) Comprehensive maintenance of all equipment under leased service like cloud data centre, MPLS band width or better secured connectivity etc.
d) Comprehensive maintenance of NAN / WAN communication infra between field devices and the cloud data centre
e) Day to day operations of the AMI system under supervision and authority of the Utility. These shall include among others,
    i. New meter installation
    ii. Changeover of consumer meters from post-paid to prepaid mode and vice versa
    iii. Firmware update of remote devices (Meters and DCUs) as required
    iv. Update of tariff slabs
    v. Ensuring completion of recharge cycle of prepaid consumer meters
    vi. Connecting, disconnecting or reducing consumer's licensed load under approval from the Utility
    vii. Initiating resolution of consumer trouble tickets raised by utility CCS
    viii. Ensuring availability of BP, LP, interval data and event notifications from meters in time schedules as agreed with the utility
    ix. Ensuring scheduled completion of billing determinant calculations
    x. Ensuring daily reports from the AMI system as per agreed list, are made available to utility
    xi. Ensuring Consumer Portal is kept updated
    xii. Ensuring smooth data traffic between the MDM and utility systems
    xiii. Patch management of AMI applications at cloud data centre
    xiv. Provide backup data to support SLA and AMISP invoicing
    xv. Carry out performance checks of various functions as per agreed schedule or on demand

As part of their Operation and Maintenance responsibilities, the AMISP shall develop a compendium of Operation and Maintenance Manuals covering the areas mentioned in serial number e), Clause 7.1 of this Section. These manuals shall be kept updated as often as necessary to reflect best practices being employed in the project.

The AMISP is to hand hold the Utility 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.

7.2 AMISP's Responsibilities under Operation & Maintenance Services

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

a) One resident Project Manager cum Supervisor,
b) [Three] numbers operations staff
c) [One] support engineer for each category of hardware supplied and
d) [One] software specialists for each domain.

The above-mentioned operation and support staff shall be made available as required to meet the SLA and system availability requirements. Re-distribution of any support engineer/specialist at the cloud Data Centre shall be at the discretion of the AMISP.

It shall be the responsibility of the AMISP to collect meter data through handheld meter reading instruments for the balance meter data reads not fulfilled by the automated remote reading process. Similarly, if the remote connect / disconnect facility fails, it shall be the AMISP's responsibility to manage the function locally.

7.3 Maintenance Practices

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

a) Scheduled preventive maintenance, performance monitoring, system backup, hardware & software maintenance and update, field & network devices firmware update, emergency response and troubleshooting etc.
b) Maintaining adequate spares for maintenance.

7.3.1 Preventative Maintenance Activity

The preventive maintenance activities shall be performed by the AMISP 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 the Utility for addition and modification of utility user interface, consumer Portal/ App displays, and Database

e) Ensure Backup of the system at regular interval which is mutually decided during system design

f) Restoration of the systems upon its failure and to restore the functioning of the various application / systems at the cloud data centre. Towards this, the RPO and RTO shall have to be measured no less than once a month.

7.3.2 Integration of Equipment

All future services, protocol emulations and configuration support for integration of Smart Meters/ nodes, routers, access points, network devices, web services, integration with other offline applications etc. shall be the responsibility of AMISP and shall be part of the maintenance activities.

7.3.3 Spares inventory

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

7.4 Monitoring

The operation and performance of the various systems shall be monitored on a continuous basis. The AMISP shall conduct at least the following monitoring:

a) MDM / HES system error history logs or selected day
b) Field & Network device failure – rate and trends
c) Availability of various communication links
d) Missing meter data – rate and trend
e) Reviewing resource information
f) Cyber Security

During monitoring if any defect/ abnormality is found, the AMISP shall undertake corrective maintenance for the same. The Utility's UI shall be kept updated with a summary of such monitored data

7.4.1 System Cyber Security Monitoring

The AMISP shall also be responsible for monitoring of the system from cyber security perspective. The logs of the system shall be analysed for exceptions and the possible incident of intrusion/trespass shall be informed to the Utility and analysed to discover root cause. The monitoring shall encompass all cyber security devices installed at the cloud data centre as well as at the NOMC such as firewalls, all types of Intrusion prevention system, routers etc.

The Cyber security system shall also be subjected to Annual Security Audit from CERT-In listed auditors at the cost of the AMISP during the contract period. AMISP shall share with Utility such audit reports and implement the recommendations/remedial actions suggested by the Auditor.

7.5 Meter Accuracy Tests

In case a Consumer complains about meter accuracy post operational go-live and same isn't reasonably resolved through past consumption trend, Transformer Energy Audit, Check

Meter (by Utility), etc. AMISP will be obliged to facilitate the meter testing. In this regard, AMISP shall handover the meter for testing to CPRI Lab/ Utility Lab/ NABL accredited Lab and install a temporary meter till the period of removal and replacing meter, if found inaccurate or reinstall if found accurate.

Check meter will be provided by Discoms AMISP will be responsible for installation of check meters, there will be no separate payment for installation of check meters. The overall quantity of check meters may go upto 5% of total quantity in scope. The location/consumer for installation of check meter will be finalized by Discom. During entire contract period, AMISP is abided to follow all meter/system testing related obligations of regulator/Government as applicable on Discom during contract period.

7.6 Physical Maintenance

The AMISP shall undertake physical maintenance of all equipment/modules under the scope of this contract, in accordance with the schedule as indicated by AMISP 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.

7.7 Service Level Agreement (SLA)

Service Level Agreement (SLA) shall be monitored as mentioned in the following table. It is expected that the AMI system shall meet the minimum threshold of service defined against each lever. Any degradation below this minimum threshold will attract penalties as per bands of service level met. The idea is that it triggers a proper review of any defect / failure / performance that had been agreed upon for the project, and to find resolutions in keeping with the highest standards of service excellence. The total penalties under SLA categories are capped at [20%] of AMISP Service Charge. AMISP shall ensure that the data collection and computation for the purpose of SLA penalties (as mentioned in the following table) should be automated and visualized in Utility Interface as per Clause 2.5 of this Section.

For this purpose, each of the designated scheduled tasks in the following table, shall signal[3] the SLA computation application to record the start time. The same designated tasks shall generate mile-stone signals[4] in order that the SLA application is able to record times when various thresholds (as indicated in the table) of meter population have responded. For system level availability, the SLA computation application shall offer a ticketing system which shall be used by the Utility &/or AMISP to raise an incident against any line item at corresponding severity level. The incident originator shall select the severity level followed by selecting the incident description (as per Annexure J) available as a drop-down list within the SLA application. The ticketing system shall follow a process flow such that,

a) The AMISP's response along with time of response are recorded. This 'response' may be a simple acknowledgement of the incident or a rejection of the incident as not being part of its 'scope of work' with adequate explanation.
b) Utility's acknowledgement or rejection of AMISP 'response' along with time are recorded. If utility acknowledges the incident to be irrelevant to AMISP's scope of

[3] This signal shall be always automated, and the SLA Application would know precise number of meters involved.

[4]Alternate provision may be kept for manual entry of time for such mile-stone signals but with proper backup monitoring report made available.

work, then the incident is immediately closed, and no further records are maintained for this incident[5].

c) Resolution &/or workarounds are recorded and submitted by AMISP along with time
d) In case of enhancements and change requests, AMISP's Plan of Action (POA) and schedule are recorded
e) AMISP's POA and schedule (for enhancements and change requests) are approved by utility
f) Resolution as submitted by AMSIP is approved by utility and the incident closed. In case of rejection of resolution, the incident shall remain live and shall have to be re-worked by the AMISP.
g) All submittals, acknowledgements, approvals/agreements shall have system generated time stamps by default. There shall be also provision for a separate manual entry of time stamps.
h) It shall be the responsibility of AMISP to provide SLA report at HES too.
i) It is further submitted that Feeder meters are covered under other AMISP contract. However, consumer indexing and energy audit shall be carried out considering integration with available MDM systems and metering data of DTs/Feeders, wherever available. The bidder shall comply accordingly.

[5]The first two process steps in the ticketing system of the SLA App shall ensure complete agreement between Utility and AMSIP, before an incident is accepted for resolution.

Data Type	Performance Requirement (Averaged over a month)[6]	Penalty	SLA Penalty Calculation (For understanding purpose only)
A. Scheduled Tasks			
1. Scheduled Interval data readings			
Periodic collection of the interval load profile data for the day[7]	From 95%of meterswithin8 hours	Deduction of 0.2% of AMISP Service Charge for every 1% or part there of capped at 1% penalty	Maximum Penalty of 1% if action takes place for <91% of meters
2. Scheduled Interval data readings			
Periodic collection of the interval load profile data for the day[8]	From 98% of meters within 12 hours	Deduction of 0.2% of AMISP Service Charge for every 1% or part there of capped at 1% penalty	Maximum Penalty of 1% if action takes place for <94% of meters
3. Scheduled daily meter readings			
Previous days'[9] interval energy and total accumulated energy	From 99.5% of meters within 24 hours after midnight	Deduction of 0.2% of AMISP Service Charge for every 1% or part there of capped at 2% penalty	Maximum Penalty of 2% if action takes place for <90.5% of meters
4. Scheduled billing profile data for the bill period			
Collection of billing data for the bill period	From 99.5% of meters within 72 hours of the scheduled periodic collection/ end of the billing period and from remaining 0.5% of meters within 168 hours of the scheduled periodic collection/ end of the billing period. Please refer to Annexure K for the billing schedule	Deduction of 0.5% of AMISP Service Charge for every 0.5% or part there of capped at 3% penalty	Maximum Penalty of 3% if action takes place for <97.5% of meters

[6] Local intervention allowed to achieve SLAs
[7] Assuming interval of 30 minutes. <In case, Utility aims to change the interval, accordingly the performance requirement may need to be changed>
[8] Assuming interval of 30 minutes. <In case, Utility aims to change the interval, accordingly the performance requirement may need to be changed>
[9] All previous days from the last billing cycle

Data Type	Performance Requirement (Averaged over a month)[6]	Penalty	SLA Penalty Calculation (For understanding purpose only)
5. Scheduled energy audit and reliability indices report[10] (DT wise) (As applicable)			
Generation of monthly energy audit and reliability indices report	From 100% of DT installed meters within 384 hours (16 days)	Deduction of 0.1875% of AMISP Service Charge for every 1% or part there of capped at 1.5% penalty	Maximum Penalty of 1.5% if action takes place for <93% of meters
6. Scheduled energy audit and reliability indices report[11] (Feeder wise) (As applicable)			
Generation of monthly energy audit and reliability indices report	From 100% of installed Feeder meters within 384 hours (16 days)	Deduction of 0.25% of AMISP Service Charge for every 0.5% or part there of capped at 1.5% penalty	Maximum Penalty of 1.5% if action takes place for <97.5% of meters
B. Remote Actions / tasks performed by AMI System			
7. For remote connect/disconnect with acknowledgement/ response for selected meters			
Remote connect / disconnect of the AMI meters	Action performed at 90% of meters within 15 minutes	Deduction of 0.5% of AMISP Service Charge for every 0.5% or part there of capped at 2.0% penalty	Maximum Penalty of 2.0% if within 15 minutes, delivery takes place for <88.5% of meters
8. For remote connect/disconnect with acknowledgement/ response for selected meters			
Remote connect / disconnect of the AMI meters	Action performed 99.5% of meters within 6 hours	Deduction of 0.25% of AMISP Service Charge for every 0.5% or part there of capped at 1.0% penalty	Maximum Penalty of 1.0% if within 6 hours, delivery takes place for <98% of meters
9. Remotely top-up amount (for pre-paid application only)			
Delivery of top up amount/ credit recharge in case of prepayment post successful transaction from payment	99.9% meters within 30 minutes (delivered and intimated to consumer)	Deduction of 0.5% of AMISP Service Charge for delay of every 0.5% or part there of capped at 3.0% penalty	Maximum Penalty of 3.0% if within 30 minutes, delivery takes place for <97.4% of meters

[10]As defined in Clause 6 of this Section. Unless both energy audit and reliability indices report (DT wise) are generated at scheduled periodic interval, AMISP shall be considered non-compliant to the defined SLA and shall be liable to penalties.

[11]As defined in Clause 6 of this Section. Unless both energy audit and reliability indices report (DT wise) are generated at scheduled periodic interval, AMISP shall be considered non-compliant to the defined SLA and shall be liable to penalties.

Data Type	Performance Requirement (Averaged over a month)[6]	Penalty	SLA Penalty Calculation (For understanding purpose only)
gateway up to consumer interface[12]			
C. System Availability			
10. Availability of AMI System per month			
Availability of AMI System per month	≥99.5%	Deduction of 0.4% of AMISP Service Charge for every 0.5% or part there of reduction in availability capped at 4.0% penalty	Maximum penalty of 4% shall be deducted when system availability is <95.0%

Notes:

1. Maximum Penalty out of the above shall be restricted at 20% of AMISP Service Charge. The deduction shall be computed as AMISP Service Charge X penalty % as computed in above table
2. The penalty, as mentioned above, shall be computed as per the performance deviated from the performance requirement. For instance, for SLA "Periodic collection of the interval load profile data for the day", if within 8 hours, data is received from only 94.6% meters which means deviation of 0.4%, then the penalty shall be computed as $\left(\frac{\max(0.4\%,1\%)}{1\%} \text{ X } 0.2\%\right)$ = 0.2%.
3. Averaged over a month means weighted average performance from meter population over a predefined time interval. For instance,
   a. Assuming on i^{th} day or event, action was done on y_i% of total meters and within stipulated time, data was received from z_i% of y_i% meters. So, the average SLA over the month shall be computed as $\frac{\sum z_i \times y_i}{\sum y_i}$
   b. For system availability, the availability is computed as $\frac{\text{THM}-(\text{S1 X 1}+\text{S2 X 0.8}+\text{S3 X 0.5})}{\text{THM}}$; Where THM is total hours in the month when power supply to AMI system is available, S1/S2/S3 is the total non-available hours in Severity Level-1/Level-2/ Level-3. Please refer to Annexure-I for more details on the same.
4. AMISP shall submit AMI generated reports for cases mentioned above based on data available in HES/MDM
5. Exclusions: Power Outages, Meter bypass by consumers, Local Temporary/ Permanent disconnection by Utilities, Meter burnt shall be excluded from above SLA calculations. For these cases, joint visit of AMISP and Utility officials shall be carried out and field inspection report shall be submitted by AMISP to Utility for suitable action.
6. Installation/Replacement of Smart meters in terms of replacement Burnt meter case/ Provide new service connection: AMISP will ensure to replace/install the new smart meter against the defective Smart meter / new service connection within the awarded area.

   The timeframe for installation/ replacement of Smart meters shall be as follows:

Particular	Number of Days
Meter installation related to New Service Connection	4
Meter installation related to replacement of Burnt meter (Post intimation by Utility representative)	3
Meter installation related to replacement of Defective meter (Post intimation by Utility representative)	3

[12]Delay in delivery of credit recharge information to payment gateway or Utility Billing System excluded from the SLA measurement

7. For the purpose of joint visit, AMISP shall put a request to Utility who should allocate manpower for joint visit within 1 working day. In case of non-allocation/ non-availability of manpower from Utility, the report submitted by AMISP shall be final and actionable by Utility.
8. The penalties would be computed on the basis of performance of AMISP for a calendar month.
9. AMISP shall be responsible for collection of billing data for all Smart Meters within a week of the scheduled periodic collection/ end of the billing period. In case of failure in data downloading through Smart-meter, AMISP will be responsible to arrange meter data for billing purpose as per billing schedule.
10. AMISP shall be responsible for providing billing data for all the installed Smart meters even in case of non-communication of the meter.

7.8 Duties of Utility and AMISP during Operations and Maintenance Phase

The table in this section provides a summary definition of the roles and responsibilities of the AMISP and the Utility during operation and maintenance phase of the AMI Project.
Legend:

- This indicates who has primary responsibility to perform this function

A: This indicates who will provide assistance

F: Feedback

Item	Task	Utility	AMISP
1.0	**Problem Identification**		
1.1	Root cause analysis to determine whether the fault is attributable to Hardware or Software.	F	•
1.2	Resolution of problems involving third party maintainer where there is uncertainty whether the root cause is hardware or software.	A	•
2.0	**Software Problem Resolution**		
2.1	Report problem and assist with problem identification	F	•
2.2	Provide or recommend corrections, temporary patches, workarounds or other fixes to system problems	F	•
2.3	Install and test corrections, temporary patches, workarounds or other fixes to system problems	F	•
3.0	**Routine Software (including MDM, HES, Utility Interface, Consumer app/portal) Support**		
3.1	Build and maintain database, displays and reports	F	•
3.2	Perform system back-ups	F	•
3.3	Restore or reinstall software from back-ups	F	•
3.4	Monitor system logs (part of remote monitoring service)	F	•
3.5	Maintain system logs	F	•
3.6	Maintain user accounts	A	•
4.0	**Hardware (including meter, DCUs, routers, network operation and monitoring center etc.) Problem Resolution**		

Item	Task	Utility	AMISP
4.1	Report problem and assist with defining problem	A	•
4.2	Troubleshoot problem to diagnose if it is software- related or hardware-related	F	•
4.3	Identify failed component, replace failed components in the system using parts from spares inventory	F	•
4.4	Restore operation of repaired/replaced equipment	A	•
5.0	**Hardware Spare Parts**		
5.1	Manage local spares inventory	F	•
5.2	Replenish local spares inventory	F	•
6.0	**Integration and Database Work at NOMC End**		
6.1	Field Device Integration	A	•
6.2	Other System Integration	A	•
7.0	**Cyber Security Monitoring**		
7.1	Patch Updates	F	•
7.2	Cyber Security Monitoring	F	•
7.3	Annual Audits	F	•
7.4	Implementation of Recommendations during Audit	F	•
8.	**Manual Meter Read Through HHU In Case of Non- Communication of Smart Meters**	A	•

8. Training Requirements

8.1 Training Categories

The AMISP is required to organize following categories of training for the Utility personnel:

a) **Professional Training -** This is the training for the core group of implementation team of the Utility. This team will comprise of members from all the Business Functions and IT sections. Each member would be trained in the relevant function/ module. This Training would be required to be given to approximately [X] personnel. It is the responsibility of AMISP to deliver this training. Standard curriculum designed and agreed by the Utility for hardware, software and network preferably shall be arranged by the AMISP for each group. The Utility will prefer if a portion of the training is conducted on-site.

b) **End User Training -** The AMISP will provide training to the owner's team on a "Train the Trainer" basis. The Utility's team so trained will then train all of the Utility's end users. It is estimated that this training will require around [X] groups, with each group comprising of around [X] persons. These training sessions will be required to be conducted at any of the sites. The recommended training material can be in paper / electronic media with courses on Business Process Automation software fundamentals, business process overview, job activity training, and delivery options being on-line, CBTs, instructor led classrooms, etc.

8.2 Training modules

The training modules shall include but not be limited to <Utility to update the list of training as required>:

a) AMI Administration & Configuration
b) AMI Installation and troubleshooting
c) Application Management and Operations
d) Database and Data Analysis Reports
e) Cyber Security
f) Smart Meter and communication technology

An indicative list of training is as provided below.

Item No.	Description	No. of Trainees	Duration in weeks		Total Man-weeks	
			At Utility's facility	At AMISP's facility	At Utility's facility	At AMISP's facility
1	Smart Grid components Hardware and Software Course	30	1	1	30	30
2	Database, Report and Analytic Building Course	10	1	1	10	10
3	Application Software	20	1	2	20	40
4	Operator training & Maintenance course	40	1	0	40	0
5	Smart Meter & Communication network	15	1	0	15	0

Item No.	Description	No. of Trainees	Duration in weeks		Total Man-weeks	
			At Utility's facility	At AMISP's facility	At Utility's facility	At AMISP's facility
6	Cyber Security Training course	5	0	1	0	5
Total		120	5	5	115	85

8.3 Training Schedules

As part of the project implementation plan (refer Clause 10.1 of this Section), the AMISP shall draw up a training schedule in consultation with the Utility. This will enable the Utility representatives gain knowledge and understanding of the activities during the following stages of the project implementation, so that they may discharge effective oversight and witness capabilities.

1. Pre-FAT
2. Pre-Operation Go-Live
3. Operation and Maintenance
4. End of Contract

The training modules as described in Clause 8.2 shall be distributed among these phases of the training schedule and mutually agreed.-

8.4 General Requirements

General requirement for training to be imparted is as follows:

a) Training shall be conducted by AMISP personnel who are experienced instructors and speak understandable [language name].
b) The AMISP shall provide training to various user groups nominated by the Utility. The AMISP shall provide the Training Approach in the response
c) All necessary training material shall be provided by the AMISP. 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 the Utility. The Utility reserves the right to copy such materials, but for in-house use only.
e) For all trainings the travel expenses of the Utility will be borne by the Utility.
f) 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. However, all the training courses shall preferably be conducted in single batch. Training shall be done in batches comprising of Introduction, Basic and Advanced categories.
g) The training will consist of a curriculum of courses to address the issues of system operation, system troubleshooting, business-wide application, changed business processes and general use of the new system.
h) Representatives from the AMISP, 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.

i) Two Engineer's from the Utility shall be stationed at the AMISP's works during development/customization of solution as per the RFP. The deputed utility engineers shall be involved with the project till its completion.

9. Tests, Inspections and Management of the Quality Assurance / Quality Control Program

9.1 Responsibility of Tests and Inspection

Test and inspections are in the complete purview of the AMISP and its sub-vendors. It shall be ensured that there are no conflicts in roles played between AMISP personnel carrying out tests / inspections, and those assigned responsibilities of quality assurance (QA) and quality control (QC).

The QA/QC organization of the AMISP shall be an independent administrative and functional structure reporting via its manager to the AMISP's top management. The QA/QC manager(s) shall have the authority within the delegated areas of responsibility to resolve all matters pertaining to quality when actual quality deviates from that stated in the Work Statement. The personnel performing QA/QC functions shall have well-defined responsibility, authority, and organizational freedom to identify and evaluate quality problems and to initiate, recommend, or provide solutions during all phases of the Contract.

The QA/QC Manager designate for the project shall be the custodian of all inspection and test records/certificates. QA/QC Manager either directly or through its authorized representative shall be responsible for all witness testing, approval of test records and in general, management of the QA/QC program of the project.
The responsibility for inspections and tests is borne by the Inspections and Tests Manager. This team is responsible for creating the various inspection and test procedures and under the general supervision of the QA/QC Manager, conducts the tests.
In the event any imports are required for the purposes of this AMISP Contract, such imports shall be in accordance with all applicable laws including those issued by Ministry of Power (Order No. No.9/16/2016-Trans-Part(2) dated 18 November 2020; as amended and/ or modified from time to time) for testing of imports including those from prior reference countries.

AMISP to ensure 100% Testing of Meters from Discom's Meter Testing lab to check the accuracy class of the meters as per IS, before installation and Transportation of Meters for this activity shall be in AMISP's scope.
However, this percentage can be reduced but not below 75% on the discretion of Discom . Further, in case of non-availability of capacity at Purchaser testing lab, such testing can be permitted at another NABL labs.
However, the Utility may conduct communication and relay testing on the sample meters during the process of accuracy testing. It is the responsibility of the AMISP to provide necessary integration support with Discom Meter Testing Bench for communication testing and relay testing.

Conduct type tests or provide documented evidence of type testing and BIS certification to the Utility:

The AMISP shall submit Type test report certificate as part of bid submitted by the Bidder. The Type test report certificate should not be more than 5 years old as on date of opening of bid.
The AMISP shall submit the type test certificate of Smart Meters (Consumer and Distribution Transformer) as per IS: 16444 and get the approval from Utility/ Purchaser before supply of Smart Meters. The certification shall be obtained latest by the Factory Acceptance Test.

The Smart meter (WAN /NAN) should be type tested at any NABL accredited Laboratory in accordance with IS 16444 with latest amendments and our tender specifications, CBIP Report 325 and IS15959 with latest amendments. The Bidder shall submit BIS/Type test/NABL certificate for those make of meters which they are going to install along with OEM authorization form. In case during implementation phase agency want to include meter of other make then he has to submit BIS/Type test/NABL certificate for that make.

9.2 In-Process Inspection

9.2.1 Type Testing and Data Exchange Protocol 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 as per BIS standards. The Data Exchange Protocol Tests are defined as those tests which establish compliance with DLMS/COSEM application layer. The Type Testing and the Data Exchange Protocol Testing shall comply with the following general conditions.

a) The QA/QC Manager 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 nationally/Internationally accredited labs and type test certificates shall not be more than five years old.

b) 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 AMISP.

c) For direct connected Smart Meters, the Type Tests shall follow IS 16444 read in conjunction with IS 13779. The test schedule adopted for running the Type Tests along with the sampling criteria and the criteria for conformity shall follow IS 13779.

d) For transformer operated Smart Meters, the Type Tests shall follow IS 16444 (Part 2) read in conjunction with IS 14697. The test schedule adopted for running the Type Tests along with the sampling criteria and the criteria for conformity shall follow IS 14697.

e) For pluggable NIC modules, the type tests shall be carried out with the NIC module integrated in the field device, that is meters and DCUs being supplied under the project. Type test on smart meters are to be performed with the NIC module, it is treated as part of meter.

f) Type Tests and Data Exchange Protocol Tests shall be certified or performed by nationally/internationally reputed laboratories using material and equipment data sheets and test procedures that have been developed for the project. The test procedures shall be formatted as in the specifications and shall include a complete list of the applicable reference standards before commencement of test (s).

g) The AMISP shall prepare a detailed schedule for performing all specified type tests.

h) The AMISP shall ensure that all type tests can be completed within the time schedule offered in its Technical Proposal.

i) In case of failure during any type test, the AMISP shall follow the conformance criteria as laid out in corresponding standard (refer serial number c and d above)

j) For direct connected Smart Meters, the Data Exchange Protocol Tests shall follow IS 16444 (Part 1) read in conjunction with IS 15959 (Parts 1 & 2). The sampling criteria for running these tests shall be [one per one lakh] smart meters under production.

k) For transformer operated Smart Meters, the Data Exchange Protocol Tests shall follow IS 16444 (Part 2) read in conjunction with IS 15959 (Parts 1 & 3). The sampling criteria for running these tests shall be [one per one lakh] smart meters under production.

l) Documentation for all factory, field, and availability tests that apply to the AMI system shall be provided in accordance with the requirements defined in this section of specification

9.2.2 Quality Assurance and Quality Control Program

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 AMISP'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.

The program shall provide for prevention and ready detection of discrepancies and for timely and positive corrective action. The QA/QC Manager shall document objective evidence of quality conformance.

Instructions and records for quality assurance shall be controlled and maintained at the system levels. The AMISP shall outline its QA/QC program plan along with any supporting documents in the Technical Proposal and update the QA/QC program document following site the survey.

A Quality Assurance Program of the AMISP shall cover but not be limited to the following:

a) The organization structure for the management and implementation of the proposed Quality Assurance Program

b) Documentation control system

c) Qualification data for key personnel

d) The procedure for purchase of materials, parts/components and selection of Sub-contractors' services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases, etc.

e) System for shop manufacturing including process controls

f) Control of non-conforming items and system for corrective action

g) Control of calibration and testing of measuring and testing equipment

h) Inspection and test procedure for manufacture

i) System for indication and appraisal of inspection status

j) System for quality audits

k) System for authorizing release of manufactured product

l) System for maintenance of records

m) System for handling, storage and delivery

n) A Quality Plan detailing out the specific quality control procedure adopted for controlling the quality characteristics of the product.

The QA/QC Manager shall be required to make available to the Inspection and Testing Team, all the Quality Assurance Documents as stipulated in the Quality Plan at the time of inspection of equipment/materials.

9.2.3 Scope and Duties of QA/QC Program Manager

The QA/QC Manager of the AMI Project shall have the right to carry out Quality Audit and Quality Surveillance of the systems and procedures of the AMISP'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:

a) Review of all the AMISP's drawings, engineering data etc.

b) 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.

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

d) Issue certificate of acceptance

e) Review and suggest modification and improvement in completion schedules from time to time; and

f) Monitor the Quality Assurance program implementation at all stages of the works.

9.2.4 Inspection and Test

All materials furnished and all work performed under this Specification shall be inspected and tested. 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 the QA/QC Manager

Documents identified in the hardware and software quality assurance plan and procedures shall be inspected to verify that the required quality assurance activities have been performed in the manufacturing process of hardware and software.

Inspections will include visual examination of hardware, enclosure cable dressings, and equipment and cable labelling.

Should 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 AMISP 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.

The test shall be considered complete when (a) when all variances have been resolved; (b) all the test records have been filed; (c) QA/QC Manager acknowledges in writing the successful completion of the test.

9.2.4.1 Test Plans & Procedures

Test plans shall be provided by the QA/QC Manager, for all tests to ensure that each factory and field test is comprehensive and verifies all the features of the equipment are tested.

The Inspection and Test Manager in AMISP 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.

9.2.4.1.1 Test Plans

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 QA/QC 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.

9.2.4.1.2 Test Procedures

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 in general 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.

9.2.4.1.3 Test Records

The complete record of all factory and field acceptance tests results shall be maintained by the designated QA/QC Manager of AMISP. The records shall be maintained in a logical form and shall contain all the relevant information. The test reports shall be signed by the inspection & testing engineer and the QA/QC representative 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 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 AMISP's test engineer and QA/QC representative.

f) Provision for comments by test engineer and QA/QC representative

g) Copies of any variance reports generated

h) Copies of reports, display copies, and any other hardcopy generated as part of the test.

9.2.4.1.4 Reporting of variances

Starting from the dry run test period, a variance report shall be prepared by the inspection and testing engineer 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) Identification of testing and QA/QC representatives

f) Estimated date and time when variance is expected to be fixed

g) Description of the corrective actions taken (to be completed as part of the variance resolution process

h) Dated signature lines for the QA/QC and test 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 AMISP 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 AMISP 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 between QA/QC Manager and the Inspection and Testing Manager.

The class shall be assigned by the QA/QC representative.

The QA/QC Manager 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).

All actions taken to correct variances shall be documented on the variance report by the AMISP. Sufficient information shall be recorded to enable QA/QC representative to determine the need for and extent of retesting, the need for testing interactions of the correlation with any previously tested hardware or software, and the need for updating appropriate documentation. A variance shall be deemed resolved after retesting has been performed satisfactorily and the test engineer and QA/QC representatives have acknowledged correction of the variance on the variance report.

9.2.4.2 Test Initiation

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.

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 AMI systems operating environment can be recreated starting with an un-initialized 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 AMI Systems shall be taken on the archive media so that AMI 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 AMISP using the test plans and test procedures.

9.2.4.3 Test Completion

A test shall be deemed to be successfully completed only when:

a) All variances have been resolved

b) All test records have been documented and issued

c) QA/QC acknowledges, in writing, successful completion of the test.

9.2.5 Factory Acceptance Test (FAT)

The factory tests shall be conducted on all the equipment to be supplied under the project. FAT[13] 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

Arrangements shall be made to carry out the tests for pluggable NIC modules integrated into three different meter makes, including the make(s) of meter being supplied by the AMISP. The slot for plugging the NIC modules in the meter shall conform to this specification. The FAT shall be carried out on the meter and/or DCU integrated with the NIC modules. If any on-line communication failover has been agreed between the Utility and the AMISP, tests shall be carried out to check a

[13] It is expected that the FAT for equipment supplies shall happen in phases of delivery. For this a test cum development system environment shall have to be created for the AMI system, with the HES, MDM and Database application servers installed in the target cloud data centre. This test / development system environment shall be separate from the production environment and shall continue to serve the purpose of development system beyond the FAT phase, for the total duration of the project

seamless failover of communication. The three makes of meters shall be checked with NIC modules for all type of communication technologies selected for the project.

Before the start of factory testing, the QA/QC Manager shall verify that all changes applicable to the equipment have been implemented, type test certificates and Data Exchange Protocol Certificates (as per sampling criteria specified) are available. As a part of the factory tests, unstructured testing shall be performed to enable proper verification of operation of the equipment under conditions not specifically tested in the above structured performance test. All special test facilities used during the structured performance test shall be made available for use during unstructured testing. On the approval of the QA/QC Manager, The Project Manager of the AMISP to inform the schedule of FAT to Utility as soon as finalised, with changes, if any. If the Utility so desires, it may choose to witness the FAT at its own cost.

9.2.5.1 Factory Test Requirements

a) The database displays and the report formats developed for the central system by the AMISP 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 AMISP shall also carry out testing of the standard protocol implementation for successful integration before the FAT starts.

d) All hardware and software associated with AMI Systems shall be staged and completely tested with simulated data at the AMISP's facility.

e) For smart meters, the FAT shall be governed by the Routine and Acceptance tests as laid out in IS 13779 and IS 14697.

f) The Tests and Inspection Manager of the AMISP is responsible for conducting all factory tests.

g) Each of the factory tests described below (i.e., Routine & Acceptance Test of Smart Meters, the hardware integration test, the functional performance test, and the integrated system test, unstructured tests) shall be carried out under factory test stage.

9.2.5.2 Sample Routine & Acceptance Tests for Smart Meters

a) These tests for Smart Meters are in addition to the Type Test requirements specified under clause 9.2.1 and the Routine and Acceptance tests that the AMISP will carry out as a part of their FAT procedure.

b) The sample Routine and Acceptance tests as per IS 13779 and IS 14697 shall be performed in a third-party NABL accredited laboratory. The Utility shall have the authority of selecting the samples (in accordance with IS 13779 and IS 14697) for carrying out the Routine and Acceptance Tests. The AMISP shall be obliged to undertake these tests at their own cost. The conformity requirement shall follow IS 13779 and IS 14697 as the case may be.

c) The AMISP shall be responsible for packing, handing over the material to the respective labs and ensuring transportation of the material directly from the

manufacturer's location to the Labs for testing and delivering the material to site after successful test results are obtained. The AMISP shall be obliged to undertake all expenditures that shall be incurred towards packing, transport, inspection, testing charges etc.

d) The lot wise testing shall be as per Technical specifications.

e) Lot wise sampling shall be as per IS13779 and IS16444.

f) AMISP to ensure 100% Testing of Meters from Purchaser's Meter Testing lab to check the accuracy class of the meters as per IS, before installation and Transportation of Meters for this activity shall be in AMISP's scope.

9.2.5.3 Hardware Integration Test

The hardware integration test shall confirm that the computer hardware conforms to this Specification and the AMISP-supplied hardware documentation. The hardware integration test shall be performed when the computer hardware has been installed in the AMISP's factory. 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.

9.2.5.4 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 CSP 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:

a) Inspection of all equipment for conformance to drawings/document and satisfactory construction and appearance

b) Testing of the proper functioning of all software, including test cases with normal and exception user-entered inputs and responses

c) Simulation of local error and failure conditions

d) Verification that ultimate expansion requirements are met

e) Verification of data link interfaces with other Central systems

f) Verification of Field Device communication interfaces (with failover if any) and data link interfaces with other central systems. This shall include the tests of three makes of meters with different types of NIC modules.

g) Simulation of Field Device and data link communication errors and channel failures, including incorrect check codes and random channel noise bursts

h) Testing of all user interface functions, including random tests to verify correct database linkages

i) Simulation of hardware failures and input power failures to verify the reaction of the system to server and device failure

j) Demonstration of all features of the database, display, and report generators and all other software maintenance features. These shall include but not be limited to functional features like pre-payment calculations, billing determinants, tariff settings, energy audit, generation of NMS reports, data base maintenance functions etc.

k) Demonstration of the software utilities, libraries, and development tools

l) Verification that the computer system meets or exceeds performance requirements

m) Verification of the accuracy of hardware and software documentation via random tests

n) Sample check of meter calibration accuracy and testing of spare parts.

9.2.5.5 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 AMISP-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 failure over occurs. Further the test shall not be conducted with the failed device.

9.2.5.6 Unstructured Testing

Periods of unstructured testing shall be allocated to allow AMISP to verify proper operation of the systems under conditions not specifically included in the test procedures. Unstructured testing shall be conducted in compliance with the following conditions:

a) A minimum of 25 percent of the actual test period shall be reserved for unstructured test of the system

b) The AMISP's Tests & Inspection Manager along with the QA/QC representative shall be present during unstructured test periods

c) All simulation software, test cases, and other test facilities used during the structured portions of the factory tests shall be available for use during unstructured testing

d) Unstructured testing shall not begin prior to the start of the functional performance test

e) Unstructured testing shall be allowed at the discretion of QA/QC Manager both at the end of a structured test segment and after completion of the functional performance test.

9.2.5.7 Dispatch of Material to Site

The Material Inspection Clearance Certificate (MICC) for all hardware shall be issued by Utility only after successful completion of FAT as per specification. For this the QA/QC Manager of the AMISP is obliged to submit a comprehensive FAT clearance report to the Utility. At least 10 Field Devices for each protocol shall relate to each central system and the remaining Field devices shall be simulated in the factory test environment. The data exchange between central systems shall also be simulated in the factory test environment.

All Equipment Suppliers/OEMs to the project shall make use of categorised Interim Inspection Reports (CIP Clearance) from Utility to ship materials to site after completion of FAT. CIP shall be issued by the Utility subject to specific FAT report carried out under the responsibility of the QA/QC Manager. Categorised Interim Inspection Report with the lowest category would mean a complete failure of FAT and hence rejection of material. A category between the lowest and the highest, shall mean pending actionable points of minor nature, but material deemed fit for dispatch to site. The category of CIP shall be authorised by the QA/QC Manager and issued by the Utility. In case where CIP is authorised by the QA/QC Manager with the highest category (with no pending actionable points in FAT), the Utility shall issue a Material Inspection Clearance Certificate (MICC) ..

9.3 Field Installation and Integration Test (FIIT)

Before the start of the FIIT, the following steps have to be completed:

a) Sample Routine & Acceptance Tests for Smart Meters

Lot wise sampling shall be as per IS13779 and IS16444.

These tests for Smart Meters as specified in clause 9.2.5.2 may be repeated at the discretion of the Utility on lots received in the warehouse of the AMISP at site.

The sample Routine and Acceptance tests as per IS 13779 and IS 14697 shall be performed in a third-party accredited laboratory. The Utility shall have the authority of selecting the samples (in accordance with IS 13779 and IS 14697) for carrying out the Routine and Acceptance Tests. The AMISP shall be obliged to undertake these tests at their own cost. The conformity requirement shall follow IS 13779 and IS 14697 as the case may be.

b) All field level hardware which has undergone FAT shall be installed at the site and the installation report signed off.

c) Before the delivery of the first lot of field devices (meters/DCUs etc.),

a. The production hardware (servers, WS, LAN/Routers, FW, etc.) and software shall be provisioned at the cloud data centre.
b. The IT hardware shall be installed and made functional at the NOMC with requisite connectivity to the cloud data centre.

d) The installed field hardware shall be configured and registered in the production environment of the cloud data centre.
e) It shall be ensured that the smart meter deployment follows a contiguous area coverage plan (As appliable). This is to mean for each installation of DT meter, attempt shall be made to prioritize deployment of all downstream consumer meters and for each installation of feeder meter, similar effort shall be made to prioritize deployment of all downstream DT/Boundary meters. However, this requirement of contiguous area coverage plan may exclude dispersed metering for certain industrial, commercial and government consumers at non-contiguous electrical locations as per the scope of work

It shall be the responsibility of the AMISP to devise the FIIT tests regime. The tests regime so developed shall be shared with the Utility at the time of submittal of the QA Plan. Any comments received from the Utility shall be addressed within the FIIT. At the minimum the 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 MDM in line with a use case table to be drawn up by the AMISP. A use case table is provided in Clause 2.4 of this Section for reference purpose

Appropriate notice shall be sent to the Utility by the QA/QC Manager before the start of the FIIT test regimes to enable the Utility to witness the same.

9.3.1 Tests on receipt of complaint by consumer

During the project period, in case of receipt of complaint by consumer of faulty meter reading within three months of installation, the AMISP would follow the policies of the utility or corresponding regulations that have been laid out. For this purpose, the Utility may also install its own check meter. In case of any discrepancy, based on the process followed as per the prevalent utility policy / regulation, the lot shall be subjected to Routine & Acceptance Test through Third Party NABL Accredited Lab. If the lot is found faulty, the same shall be replaced by the AMISP at its own cost.

9.4 Site Acceptance Test (SAT)

Once the AMISP finalizes the SAT schedule, the QA/QC Manager shall invite the Utility to witness the tests as per their convenience.

SAT shall be carried out with Smart Meters/DCUs 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 cloud data centre and its hardware and software components along with supply, installation & integration of a minimum of [5%] Smart Meters/ DCUs (along with its related hardware and software equipment). The SAT for remaining meter population

shall be staged on monthly basis based on the monthly supply, installation and integration of Smart Meters (along with its related hardware and software equipment).

The AMISP shall start up and check the performance of the equipment of field locations. All hardware shall be aligned and adjusted, interface/es to all inputs and outputs installed, operation verified, and all test readings recorded in accordance with the AMISP's recommended procedures. The SAT shall exhibit generally all functions of the equipment and duplicate factory test. All variances must be corrected prior to the start of the SAT. The list of final tests to be carried out in the field shall be listed in the site-testing document by the AMISP. Among others, the site testing document shall include the following minimum performance tests:

Data Type	Performance Requirement
1. Load Profile Data Read[14]	
One-month block load profile for installed meters	From 98% of the meters in 12 hours after the midnight
2. Billing Profile Data Read[15]	
Billing profile data for installed meters	From 98% of the meters in 12 hours after the midnight
3. On-Demand Remote reads of meters	
Collection of 7 days of interval energy data and the current total accumulated energy from a selected individual meter	Within 2 minutes
4. Remote connect / disconnect	
Action to response for individual meter	Less than 3 mins
5. Updating of data on consumer portal/ app	
Updating of individual consumer data on portal/ app after receiving the data in MDM	Action performed for active on portal consumers within 5 minutes after receiving the data in MDM
6. Ping Response with acknowledgement/ response for selected meters	
For installed meters	Action performed at 98% of meters within [5] minute; and
For an individual meter	Action performed within 3 seconds
7. Meter loss and restoration of supply	
Receiving of alert for all affected AMI meters	Alert to be received within 3 minutes for 60% of meters
8. Meter Tamper Alerts	
Receiving of alert for an individual meter	Alert to be received within 3minutes
9. Power Quality Alerts	

[14]This performance test shall be done during SAT, from second lot of meters onwards
[15]This performance test shall be done during SAT, from second lot of meters onwards

Data Type	Performance Requirement
Receiving of alert for an individual meter	Alert to be received within 5 minutes
10. Firmware upgrade with acknowledgement/ response for selected meters	
For installed AMI meters (for a batch of at least 20% of installed base) This type testing shall not be performed on meters installed on the field.	Action performed at 99% of meters within [18] hours; and
	Action performed at 99.9% of meters within [24] hours
11. **Remotely altering settings in meter**	
For installed AMI meters (for a batch of at least 20% of installed base)	Action performed at 99% of meters within [8] hours; and
	Action performed at 99.9% of meters within [24] hours
12. Remotely read events logs	
For reading the full event log for installed AMI meter	Action performed at 90% of meters within [30] minutes; and
	Action performed at 99% of meters within 1 hour; and
	Action performed at 99.9% of meters within [6] hours.
13. VEE processing	
For all installed meters	Action performed in [15] mins
14. Computation of Billing Determinants	
For all installed meters	Action performed in [2] hours
15. Prepaid Recharge	
Payment success to consumer acknowledgement	Within 5 mins
Payment success to meter update (From MDM to HES to Meter)	• From 90% of meters within 30 minutes • From 99% of meters within 1 (one) hour
16. Utility User Interface	
Manual data entry of new value appears on screen	Less than 6 secs
Acknowledgement of any action request	Within 3 secs
Display update rate	2 secs
17. **Disaster Recovery Capability (Refer to Clause 2.7.3.3.9 of this Section for details)**	
Recovery Time Objective (RTO)	[4 hours] as agreed
Recovery Point Objective (RPO)	[2 hours] as agreed
18. **On-Demand Remote reads of meters**	

Data Type	Performance Requirement
Collection of 7 days interval energy data and the current total accumulated energy from a group of 10% of installed base of meters (configurable)	95% complete within 2 hrs 100% complete within 4 hrs

The list of final tests to be carried out in the field shall be listed in the site-testing document by the AMISP. Among others, the site testing document shall include the following minimum performance tests for end-to-end metering carried out in contiguous electrical locations:

Data Type	*Performance Requirement*
1. Load Profile Data Read[1]	
One-month block load profile for installed meters	*From 98% of the meters in 12 hours after the midnight*
2. Billing Profile Data Read[2]	
Billing profile data for installed meters	*From 98% of the meters in 12* *hours after the midnight*
3. On-Demand Remote reads of meters	
Collection of 7 days of interval energy data and the current total accumulated energy from a selected individual meter	*Within 2 minutes*
4. Remote connect / disconnect	
Action to response for individual meter	*Less than 3 mins*
5. Updating of data on consumer portal/ app	
Updating of individual consumer data on portal/ app after receiving the data in MDM	*Action performed for active on portal consumers within 5 minutes after receiving the data in MDM*
6. Ping Response with acknowledgement/ response for selected meters	
For installed meters	*Action performed at 98% of meters within [5] minute; and*
For an individual meter	*Action performed within 3 seconds*
7.Meter loss and restoration of supply	
Receiving of alert for all affected AMI meters	*Alert to be received within 3 minutes for 60% of meters*
8. Meter Tamper Alerts	
Receiving of alert for an individual meter	*Alert to be received within 3 minutes*
9. Power Quality Alerts	
Receiving of alert for an individual meter	*Alert to be received within 5 minutes*

10. Firmware upgrade with acknowledgement/ response for selected meters	
For installed AMI meters (for a batch of at least 20% of installed base)	*Action performed at 99% of meters within [18] hours; and*
	Action performed at 99.9% of meters within [24] hours
11. ***Remotely altering settings in meter***	
For installed AMI meters (for a batch of at least 20% of installed base)	*Action performed at 99% of meters within [8] hours; and*
	Action performed at 99.9% of meters within [24] hours
12. Remotely read events logs	
For reading the full event log for installed AMI meter	Action performed at 90% of meters within [30] minutes; and
	Action performed at 99% of meters within 1 hour; and
	Action performed at 99.9% of meters within [6] hours.
13. VEE processing	
For all installed meters	*Action performed in [15] mins*
14. Computation of Billing Determinants	
For all installed meters	*Action performed in [2] hours*
15. Prepaid Recharge	
Payment success to consumer acknowledgement	*Within 5 mins*
Payment success to meter update (From MDM to HES to Meter)	• *From 90% of meters within 30 minutes* • *From 99% of meters within 1 (one) hour*
16. Utility User Interface	
Manual data entry of new value appears on screen	*Less than 6 secs*
Acknowledgement of any action request	*Within 3 secs*
Display update rate	*2 secs*
17. ***Disaster Recovery Capability (Refer to Clause 2.7.3.3.9 of this Section for details)***	
Recovery Time Objective (RTO)	*[4 hours] as agreed*
Recovery Point Objective (RPO)	*[2 hours] as agreed*
18. ***On-Demand Remote reads of meters***	

Collection of 7 days interval energy data and the current total accumulated energy from a group of 10% of installed base of meters (configurable)	*95% complete within 2 hrs* *100% complete within 4 hrs*

Also, among others, the site testing document shall include the following minimum performance tests for DT/ Feeder metering carried out in non-contiguous electrical locations:

Data Type	Performance Requirement
1. Load Profile Data Read[16]	
One-month block load profile for installed meters	*From 98% of the meters in 12 hours after the midnight*
2. On-Demand Remote reads of meters	
Collection of 7 days of interval energy data and the current total accumulated energy from a selected individual meter	*Within 2 minutes*
3. Ping Response with acknowledgement/ response for selected meters	
For installed meters	*Action performed at 98% of meters within [5] minute; and*
For an individual meter	*Action performed within 3 seconds*
4. Meter loss and restoration of supply	
Receiving of alert for all affected AMI meters	*Alert to be received within 3 minutes for 60% of meters*
5. Meter Tamper Alerts	
Receiving of alert for an individual meter	*Alert to be received within 3 minutes*
6. Power Quality Alerts	
Receiving of alert for an individual meter	*Alert to be received within 5 minutes*
7. Firmware upgrade with acknowledgement/ response for selected meters	
For installed AMI meters (for a batch of at least 20% of installed base)	*Action performed at 99% of meters within [18] hours; and*
	Action performed at 99.9% of meters within [24] hours
8. Remotely altering settings in meter	
For installed AMI meters (for a batch of at least 20% of installed base)	*Action performed at 99% of meters within [8] hours; and*

[16] This performance test shall be done during SAT, from second lot of meters onwards

	Action performed at 99.9% of meters within [24] hours
9. Remotely read events logs	
For reading the full event log for installed AMI meter	*Action performed at 90% of meters within [30] minutes; and*
	Action performed at 99% of meters within 1 hour; and
	Action performed at 99.9% of meters within [6] hours.
10. VEE processing	
For all installed meters	*Action performed in [15] mins*
11. On-Demand Remote reads of meters	
Collection of 7 days interval energy data and the current total accumulated energy from a group of 10% of installed base of meters (configurable)	*95% complete within 2 hrs* *100% complete within 4 hrs*

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 a clear SAT Report shall be issued for the benefit of the Utility. These SAT reports shall be signed by both the Inspection and Tests Manager and the QA/QC Manager.

9.5 System Availability Test

QA/QC Manager will be responsible for oversight of the conduct of the availability test. The test shall consist of normal AMI Systems operations without special test equipment or procedures.

Test records defined in the availability test plan and procedures will be maintained by QA/QC Manager. AMISP will operate and maintain the system according to procedures described in the AMISP documentation. QA/QC Manager shall raise incident reports for every incident that is encountered and closed with response time, resolution time and hold times.

AMI systems maintenance on an on-call basis shall be provided by the AMISP during the availability test period. When on-site maintenance support is needed, qualified AMISP personnel shall arrive at the site within maximum four (4) hours of notification and shall keep records of the progress in problem resolution. For availability purposes, this service response time and the associated on-site maintenance time shall be taken into account as defined in sections of "Downtime" and "Hold time".

The AMISP shall maintain an inventory of spare parts, which may be required to achieve the specified availability. These spares shall be in addition to the mandatory spares. All spare parts used during the availability test shall be drawn from AMISP's inventory.

9.5.1 Downtime

Downtime occurs whenever the criteria for successful operation defined in Clause 9.6.1 of this Section are not satisfied. Downtime shall be measured from the start of diagnostic procedures until full service is restored. In the event of multiple failures, the total elapsed time for repair of all problems (regardless of the number of maintenance personnel available) shall be counted as downtime. For onsite response the delay in response time (more than four hours) shall be added to downtime.

9.5.2 Hold time

During the availability test, certain contingencies may occur that are beyond the control of any stake holder. These contingencies may prevent successful operation of the system but are not necessarily valid for the purpose of measuring AMI systems availability. Such periods of unsuccessful operation may be declared "hold time". Specific instances of hold time contingencies are:

a) **Scheduled Shutdown**: During scheduled shutdowns, or if an equipment failure occurs while its backup device is scheduled out-of-service, the resulting system outage shall be hold time, provided that service can be restored according to AMISP-specified procedures within 30 minutes.

b) **Power Interruption and Environmental Excursion**: Loss of power or manual shutdown in the event of loss of environmental control shall be considered hold time. If the system is operated during periods of power or environmental conditions beyond those specified, any resultant downtime shall also be considered hold time.

c) **Intermittent Failure**: Periods during which an intermittent, recurring software or hardware failure is experienced will be considered hold time, provided that the AMISP is engaged in remedial action and normal functions can be restored by AMISP-defined procedures whenever the failure occurs. Instead of accounting for the actual intermittent downtime, one hour of downtime shall be counted for each 24 hours of otherwise successful operation while the problem persists.

d) **Service Response Time:** A maximum four (4) hours of hold time will be allowed for the AMISP to respond to each call for maintenance support.

e) **Corrected Design Defect**: Hold time may be declared to ensure against similar future occurrences if a failure occurs due to a defect in system design for which the AMISP defines and implements corrective measures. In such a case, hold time shall be allowed in increments of 24 hours to allow verification of the corrective action.

9.5.3 Test Duration and Criteria for Acceptance

After the elapse of [120 hours] of cumulative test time, the availability shall be calculated. Should availability fall short of specified percentage as defined in Clause 9.6.1 of this Section, the AMISP may either (a) Continue the test by moving the starting time of the test forward and continuing the test until the consecutive hours have been

accumulated and the specified availability has been achieved subject to maximum of 5 days, or (b) the AMISP may restart the test for 120 hours.

To establish that all failures have been satisfactorily repaired prior to the end of the availability test, no downtime, intermittent (hold time) failures, or more than one un-commanded fail over shall have occurred within 48 hours of the test's conclusion.

9.5.3.1 Criteria for successful operation

The AMI system shall be designed to meet the system availability as defined below:

S.No.	System	Minimum System Availability Requirements
1.	**Smart Meters**	**99.5%**
2.	**DCU/ AP**	**99.5%**
3.	**MDM**	**99.5%**
4.	**HES**	**99.5%**
5.	**NOMC Hardware such as UPS, Router, etc.**	**99.5%**
6.	**Utility and Consumer User Interface**	**99.5%**

The total operational time shall not include the hold time. The system shall be considered available as long as all the requirements defined under Clause 9.5 are available.

9.6 Operational Go Live

9.6.1 Conditions to Be Met for Operational Go Live

The Operational Go Live of the AMI system shall be considered as completion of the SAT for [5%] or [25,000] of Smart Meters whichever is less (along with its related hardware and software equipment) supplied installed and integrated. AMISP's obligations for Operational Go Live of the system shall be deemed to be met when the following milestones are achieved:

a) Completion of training obligations pre-Operational Go-Live;
b) Supply, installation & integration of [5%] or [25,000] of Smart Meters of the respective project as per the definition of Go-Live/ UAT specified therein whichever is less (along with its related hardware and software equipment);
c) Successful completion of SAT for the quantity of Smart Meters as mentioned in serial no (b) above;
d) Successful completion of system availability test for 120 (one hundred twenty) hour. This shall be conducted on supplied systems under normal day-to-day operating conditions. The test shall verify the reliability and integrity of the Field devices, Central Systems, Communication & networking systems, database, displays, report, and all communication interfaces.

The Availability Test mentioned in Clause 9.6.1 (d) is meant for the initial supply as mentioned in Clause 9.6.1 (b). For the subsequent lots of Smart Meters along with associated equipment, only up to SAT will be required for operationalizing the lot.

9.6.2 Certification of Operational Go Live

Following the successful completion of System Availability Tests as per Clause 9.5 of this Section, the AMISP has to submit the following documentation to the Utility Project Manager:

a. Utility certification of training obligations pre-Operational Go-Live

b. SAT and resolved variance reports of initial installation phase co-signed by the QA/QC Manager and the Inspection and Test Manager.

c. Availability and resolved incident reports of System Availability Test signed by QA/QC Manager

d. Initial third-party Cyber Security Audit Compliance Report

Based on these submittals the utility shall check for the completeness and accuracy of the submittals and issue Operational Go Live certificate to the AMISP in not more than [3] days from the date of submittal. Commercial operation shall be effective from the date mentioned in this certificate.

9.6.3 Independent third-party cyber security audit and compliance for Operational Go Live

i. The utility, at its own cost, shall appoint an independent third-party cybersecurity auditor, empanelled by CERT-In, to conduct a comprehensive audit of the integrated AMI system after operational Go-Live and annually thereafter during the contract period. The cost of resolving any vulnerabilities shall be borne by the AMISP. The comprehensive audit should verify compliance with the cybersecurity requirements outlined in this document and will include a Vulnerability Assessment and Penetration Testing (VAPT) of the entire system.

ii. The AMI Service Provider (AMISP) shall:

a. Assist and facilitate DISCOM/Utility for conducting third party cyber security audit, address and remediate all identified or reported cybersecurity vulnerabilities of this audit at its own cost i.e. AMISP.

b. Submit a Cybersecurity Audit Compliance Report detailing the resolution and closure of all audit findings and vulnerabilities.

10. Project Management

Prior to AMI Project Implementation, the AMISP will prepare and submit a detailed project implementation plan, in consultation with the Utility, to ensure smooth takeover of existing Utility systems and any ongoing services under the scope of the AMI Project.

10.1 Project Implementation Plan would cover the following:

i. Understanding of Utility and its requirement with respect to Project implementation;
ii. Overall system architecture and system philosophy capable of scale-up;
iii. Details of proposed methodology;
iv. Schematic Diagram of Proposed System Configuration
v. Strategy for deployment of feeder-wise smart meters and communication infrastructure
vi. Detailed bill of quantities for materials and services (including any special equipment) necessary to meet the technical specifications, functional & performance requirements
vii. An approach paper documenting the interfaces for integration with existing and future applications based on the information provided by utility
viii. Project team structure;
ix. Line of Credit / Source of funding and supporting documents;
x. Governance framework;
xi. Resource planning and estimation;
xii. Risk planning;
xiii. Quality Assurance/ Quality Control of the Program (including Testing and Inspection);
xiv. Data Privacy Approach
xv. Cyber Security Approach;
xvi. Site Survey result;
xvii. Documents, Data Requirement Sheet, Drawing submission and approval;
xviii. Installation & Field update schedule;
xix. Repair and Maintenance Schedule including details on Spares Management;
xx. Training schedule;

10.2 Key Personnel

The AMISP shall appoint at least the following personnel dedicated for the AMI Project

a) **Project Manager:** She / he shall have the authority to make commitments and decisions that are binding on the AMISP. Utility will designate a Nodal officer to coordinate all project activities. All communications between the Utility and the AMISP shall be coordinated through the project manager and nodal officer. The project manager should be an expert in 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.
b) **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.
c) **Cyber Security Expert:** An expert in cyber security related aspects covering planning and implementing high level system security requirements, managing data privacy and

confidentiality, information flow through adequate authorizations, threat modelling and security testing

d) **Communication Protocol Expert:** An expert in communication protocols and in implementing applications using different communication technologies and ensuring communication inter-operability across applications/functionalities

The project manager shall be responsible for bringing in the Cyber Security expert and Communication Protocols expert at the appropriate stage in the project as and when required.

10.2.1 Role of AMI experts deployed by the AMISP

a) AMISP shall provide Domain experts at Corporate level and Circle level during the Contract period. AMISP shall depute 02 no. Domain experts at Corporate level for project monitoring and assistance to Smart metering cell. AMISP shall depute 01 no. Domain expert at circle level. For proper functioning of the project, the AMISP shall deploy PCs (circle level- 02 no. and corporate level- 06 no.). Necessary space shall be provided by Discom. However, to meet the timelines & SLAs, the AMISP is free to deploy resources as per his experience.

b) Below is the broad scope of work / expectation from the offered advisory services/ domain expert:

(i) Selection of feeder/zones:

i. Domain experts to advise and guide the Discom to priorities meter installations in the project area.
ii. All the new installations will be tagged to DTRs. Domain experts shall advise the project team on the methodology to map the other consumers with DTRs.

(ii) Survey:

a. Monitoring of Load survey profiles from DTR meters as well as consumer meters shall regularly.

Loss calculation:

- month weekly consumption shall be compared with previous month consumption, same week previous year, etc.)
- Domain experts shall plot several loss trends to provide insights to engineers / management on the different scenarios and help them taking informed decisions.

c) Identification of cause/reason for losses:

- The Consultants shall prepare reports in categorization of losses into, but not limited to, following categories: (a) T&D network, (b) load imbalance, (c) power factor, (d) DTR locations and (e) sizing, etc.
- Similarly, the commercial losses shall be categorized into, but not limited to, the following categories: (i) metering related, (ii) improper mapping of customers, (iii) meter reading related, (iv) wrong customer category, and (v) wrong billing, etc.

d) Developing actionable plan for each cause/reason:

- Based on the above information the Consultant shall develop Action Plan with recommendations on how to tackle these specific issues for each zone based on interactive discussions with Zonal officers.
- Consultant shall conduct a Workshop to present the findings and brainstorm with Discom officials.

e) Generation of analytical reports
- Generate analytical reports without any human interface to assist better targeting of feeders, zones and consumers.
- The consultants shall prepare reports, which would help to track suspected consumers and inform the vigilance team to improve their hit rates.
- The consultant shall generate various reports, but not limited to - monthly consumption variance, pf, peak demand vs Contract demand, Interruption reports, etc.
- The Consultant shall analyze the Transformer Load to provide accurate and timely data for optimizing transformer loading and change-out programs.
- These reports need to be dynamic and changed according to the need of the Discom.

f) Monitoring of Action Plan
- The consultants shall develop a template for monitoring the action plan.
- The consultants shall prepare a monthly report for the Sr Management on the progress of action plan
- The consultants shall develop reports to monitor the number of new meters installed and alert the system in case of deviations.
- The consultants shall develop the KPIs of the Zonal officers and assist Sr Management in monitoring their progress.

g) Operations from Control Center:-
- Update the database in MDM, Connection/ Disconnection activity, tamper analysis, Generation of various reports to Discom for further action.

10.3 Progress Report

A progress report shall be prepared by the AMISP for each month against the activities listed in the project schedule. The report shall be made available to Utility on a monthly basis on a mutually agreed schedule, e.g., the 5th day of each month. The progress report shall include all the completed, ongoing and scheduled activities and transmittals issued and received for the month. The progress report will also highlight the risks to the project and plan for risk mitigation.

10.4 Transmittals

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

10.5 Review Meeting

Progress meetings shall be scheduled by the Utility and attended by the AMISP 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 review meeting will also be used to discuss upcoming milestones, support needed from the Utility, risk identified by the Program team, risk mitigation strategies and to make decisions for path forward.

The AMISP shall also attend technical meetings as and when required by the Utility 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.

10.6 Document Review and Approval Rights

To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the AMISP shall submit documentation describing the systems to the Utility for review and approval.

The Utility will respond with written comments to the AMISP within Fifteen (15) calendar days after receipt of the documents. Documents requiring correction must be resubmitted by the AMISP to the Utility within fifteen (15) calendar days. The Utility will respond to resubmitted documents within seven (7) calendar days after receipt of the document. No Project Implementation Schedule relief is to be implied for documents requiring correction and resubmission to the Utility.

The Utility shall have the right to require the AMISP to make any necessary documentation changes at no additional cost to the Utility to achieve conformance with the Specification.

To help the Utility manage the review and approval of documents during any given period, the AMISP 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.

11. Document Requirements

List of documents to be provided by the AMSIP to the Utility over the entire Contract period has been provided below. The timelines for submission along with requirement of Utility approval (if required) have also been provided herewith:

S. No.	Documentation to be submitted	Frequency	Purpose[17]
A	**Pre-Operational Go-Live Phase (from the date of execution of the Contract till the date of achievement of the Operational Go-Live of the AMI system)**		
1	A checklist of all documents on which approvals from utility or other agencies may be required;	Once	I
2	Consumer engagement plan;	Once	I
3	Detailed Project Implementation Plan including verification of all integrations with external systems as mentioned in this Contract and delineated in the approach paper created for the purpose	Once	A
4	Exit Management Plan	Once	A
5	Document/ drawings to indicate the following: i. Tentative location of devices/equipment for setting up communication network with power plan; ii. Confirmation of adequacy of space and AC power supply requirements. iii. Additional items required for interconnection with the existing/owner provided equipment/facilities; iv. Requirement of modification to existing earthing arrangement of NOMC and locations where communication equipment / devices etc. are to be installed, if any.	Once	I
6	As-Built Drawings	Updated	I
7	Quality Assurance Plan including the test plans for each stage of Testing.	Once	A
8	Type test reports, Guaranteed Technical Parameters of components and associated document as per Clause 9 of this section	Once	I
9	Data Exchange Protocol Test Certificate [one per one lakh] smart meters	Once	I
10	Consumer indexing as per the implemented AMI system	Updated	I
11	Notice to Utility to witness Factory Acceptance Test	Periodic	I

[17] **I**: Informational, no approval required from Utility, **A**: Approval required from Utility based on signed documents submitted by AMISP,

12	Factory Acceptance Test Reports with category if any	Periodic	I
13	Notice to Utility to witness Field Installation and Integration Test	Once	I
14	Field Installation and Integration Test Reports	Once	I
15	Notice to Utility to witness Site Acceptance Tests	Periodic	I
16	Site Acceptance Test Reports	Periodic	I
17	Progress report briefing the status of installation of meters and key challenges faced if any	Monthly	I
18	Notice to Utility to witness System Availability Test	Once	I
19	System Availability Test	Once	I
20	Certification for Operational Go Live with following documentation: i. SAT & resolved Variance Reports ii. Availability & resolved incident Reports iii. Completion of Training certificate iv. Third party Cyber Security Audit v. Document detailing security algorithm and security key generation method	Once	A
B	**Post-Operational Go-Live Phase (after the Operational Go-Live of the AMI system till the end of Contract Period)**		
1	Monthly progress report briefing the status of installation of meters and key challenges faced if any	Monthly	I
2	Reports as mentioned in this Contract which includes but not limited to the following: i. Service Level Agreement (SLA) performance report; ii. Monthly progress report including problems that arise with the installed AMI system (if any) including any cyber security related issues and corrective action taken by AMISP for the same.	Monthly	A
	iii. Reports mentioned in Clause 6 of the Section 6;	Monthly	I
	iv. Cyber Security Audit	Yearly	I
	v. Data Privacy Audit report;	Yearly	I
3	Change Requests / Change Notes	Periodic	A
4	Change Orders	Yearly	A
5	Operation and maintenance manual	Updated	I
6	Exit Management Plan	Updated	A

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12. Project Implementation Schedule

The Project Implementation Schedule for AMI system establishment and timelines for Related Services milestones from date of execution of the Contract are given below:

S. No.	Milestone	Timeline (in months)
1	Submission of detailed Project Implementation Plan giving the compliance sheet along with the make and model of various infrastructure, hardware & software that are proposed for delivery and operations incl.: • Specification of System • Architecture and Software Solution	Within [60] days from the date of execution of the Contract
2	Approval of detailed Project Implementation Plan by Utility	Within [15] days from the date of submission of Project Implementation Plan.
~~3~~	~~Delivery, site installation, integration and operationalization of 100% of Feeder Meters each with related hardware, software and equipment~~	~~Within [27] months from the date of execution of the Contract~~
4	• Delivery, site installation and commissioning of Network Operations cum Monitoring Centre with related hardware, software and equipment; and • Delivery, site installation, integration and operationalization of [5%] of Smart Meters each with related meter box, hardware, software and equipment and successful operational go-live	Within [7] months from the date of execution of the Contract
5	Delivery, site installation, integration and operationalization of 50% of Smart Meters each with related meter box, hardware, software and equipment	Within [18] months from the date of execution of the Contract
~~6~~	~~Delivery, site installation, integration and operationalization of 100% of DT Meters each with related hardware, software and equipment~~	~~Within [18] months from the date of execution of the Contract~~
7	Installation Milestone	Within [27] months from the date of execution of the Contract
8	Certification of Installation Milestone in accordance with the provisions of this Contract by Utility	Within [15] days from the date of Installation Milestone.
9	Operational period of the AMI system	From Operational Go-Live till end of the Contract Period
10	Transfer of AMI system to the utility	At the end of Term of the Contract in accordance with Exit Management Plan provided in Article 11.6 of GCC in Section 7

Installation Milestone

The “Installation Milestone” is defined as the milestone when installation and operationalisation is completed for the number of smart meters envisaged for the project. The AMISP is expected to complete this Installation Milestone as per the table given above. The number of smart meters envisaged may change through negative variations provided for in the Contract as mentioned in Article 14 given in Section 7. If the AMISP completes the “Installation Milestone” ahead of schedule, then the revised date shall be accepted as the date of achievement of “Installation Milestone”.

In accordance with Clause 1.15 (w) of this Section, the Utility shall provide necessary clearance/ approval/ permits that are to be issued by it for initial 20% of contiguous electrical locations (As applicable) for Smart Meter deployment along with related documentation within 6 (six) months from date of execution of this Contract. Furthermore, the Utility shall provide necessary clearance/ approval/ permits to be issued by it for remaining contiguous electrical locations as well as non-contiguous electrical locations for Smart Meter deployment along with related documentation on quarterly basis. Utility shall endeavour to provide 20% of contiguous electrical locations cleared each quarter and complete area within 18 (eighteen) months from date of execution of the Contract. The Utility shall issue a Notice no later than 7 days of expiry of time period specified above confirming the actual number of meters for which clearance/ approval/ permits is available. If the Utility fails to issue the necessary clearance and approvals or if the Utility acknowledges that no further consumer/feeder locations are available for deployment within the allotted time, then the meter population for which clearance/ approval/ permits is available shall be assumed as the number required for meeting the “Installation Milestone”.

As and when the “Installation Milestone” is achieved by the AMISP, the Utility shall be obliged to certify the milestone through a written communication giving the date and the meter population installed and operationalised.

13. Annexures

Annexure A **TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT SINGLE PHASE (5-30Amp) LT STATIC WHOLE CURRENT ENERGY METERS WITH BACKLIT LCD DISPLAY AND OPTICAL COMMUNICATION FACILITY (For Consumer Metering)**

Annexure B **TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 LT THREE PHASE WHOLE CURRENT STATIC ENERGY METERS(For Consumer Metering) as per IS applicable shall be IS:16444 Part-I & IS:15959 Part-II with latest amendment**

Annexure C TECHNICAL SPECIFICATIONS for LT C T OPERATED, DLMS COMPLIANCE CATEGORY – D3, THREE PHASE FOUR WIRE, ELECTRONIC TRIVECTOR ENERGY METERS ISI MARK, ACCURACY CLASS 0.5s

Annexure D **Three phase CT/PT operated alternating current Smart Meter of Accuracy Class 0.5S/ 0.2S (as required) HT Consumers, etc.**

As per IS 2705 part I clause 9.1.2 power frequency dry withstand test at primary and secondary shall be conducted as Routine test**.**

Annexure E System Sizing Requirement

E.1 Sizing Parameter

The system shall be designed as per the technical parameters defined in this specification and as specified in this Annexure.

The AMI system (MDM, Historian, NMS etc.) shall be suitably sized based on expansion requirements mentioned in Article 14 of Section 7.

CSP should offer auto-scaling of the compute resources based on the defined threshold of resource utilization. There should be a minimum and maximum limit defined for auto-scaling for a workload.

This memory utilization includes the memory used for storage of data (including expansion requirement defined in above para) for the defined duration as specified in the Technical Specification. The system architecture and the network design shall have the ability to handle the growth with respect to functions, and user as defined.

E.2 Configuration requirement for Hardware & Software

S.No.	Description	Future requirement
1	HES and MDM*	50% Expansion

*In future, Utility may use same HES / MDM for entire area. Provision should be there to cover such area through procurement of additional licenses. The AMISP shall bear the cost of future expansion.

E.3 Details of MDM and HES and MDM connectivity, Data Format and Exchange Mechanism:

Utility will share the input data format to the AMISP and the AMISP shall provide data at particular IP provided by purchaser in that particular format.

General Technical Specifications (GTS) of HES

Particulars	Description
Key requirements	a) The HES should generate MIS / Dashboard / Reports regarding numbers of meters read / unread on daily / weekly/ monthly and AMISP has to ensure seamless integration with MDM and data available on MDM will be the basis for the calculation of SLA; b) In case, If data is not available on MDM and reason is not attributed from HES level then after due approval from Utility, calculation of SLA will be done on the data available on HES.

Particulars	Description
	AIMSP shall be responsible for automatic generation of SLA report on HES Level also. c) Head-end System (HES) must be deployed to manage data from a multitude of field devices and applications. Smart meters, communication devices and related applications to be installed by AMISP are in Scope. HES will manage data from Smart Meters only. d) Suitable Network Management System (NMS) must be deployed to manage communication canopy network and its associated devices and to monitor the performance of network. This module must provide real time information about the canopy network and its associated devices. NMS is for HES in RF communication. e) Data from canopy network must report to main data centre but in circumstances where it is not possible then data shall report to Data Recovery Centre (DR). f) Node must have auto-discovery and auto-registration features so that RF Module along with its connecting devices shall register themselves in head-end application upon its deployment and establishment of communication. g) System must provide daily, weekly and monthly performance reports, tracking equipment failures, communications failures and security breach. h) System must facilitate OTA (Over the Air) firmware upgrade of network terminals and application devices. i) Security must be part of all the elements of solution. Bidder shall provide detailed description about the proposed security model. j) System must not be impacted by obsolescence.

Particulars	Description
	k) Bidder must work with meter bidders for integration of RF node in smart meters. Bidder must provide the methodology and approach for integration. Integration must include both hardware and protocol. l) Bidder shall provide technical specifications of canopy elements including hardware and software. m) Head-end System (HES) shall provide interface with field devices through canopy network. n) HES must provide web-based user interface for access. o) It must perform network management, device management, device data management and processing of the data before exchanging to other systems. p) AMISP has to extend technical support to ensure seamless integration of HES with MDM. q) HES shall store data for minimum 45 days. r) The AMISP shall provide a HES which is suitable to support the collection and storage of data as per performance level for a defined no. of Smart Meters with facility of future expansion as per the requirement specified in this document. s) HES shall be responsible for discovery of all Smart Meters once deployed in the field, the periodic collection of all meter data as well as the processing of all alarms and commands such as connect/disconnect for those meters. t) HES would perform all the requisite functions as per the defined functionalities of AMI and it is the responsibility of the AMISP to supply the requisite software and hardware to achieve the defined functionalities of AMI. HES shall ensure data

Particulars	Description
	integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data. u) HES shall be developed on open platform based on distributed architecture for scalability without degradation of the performance using additional hardware. The scalability shall ensure the ability to handle applicable workloads including numbers of meters installed, interval meter reads, users requesting data from meters, other events and statuses coming from meters. v) The HES shall be cloud enabled and support deployment with high availability clustering and automatic load balancing that ensure hardware as well as application failover. Adequate data base and security features for storage of data at HES need to be ensured. HES shall be integrated with MDM. w) The AMISP shall ensure that command execution (disconnection, reconnection, firmware upgrade, etc.) is feasible even under intermittent communication through periodic retries and local caching mechanisms.
Suggested functions	a) On power up after installation, Smart Meter shall register itself automatically into the HES along with its metering profile. The HES shall store meter profile status by meter type, hardware & software versions, device IDs, logged in / logged out details etc. b) Upon deployment and establishment of communication, it shall be possible for field level end device nodes (NAN/WAN) like Router/Gateway, Access Point, DCU to have self-discovery and registration. c) Acquisition of meter data on demand & at user selectable periodicity. On demand meter read may be for single meter (unicast) or for a group

Particulars	Description
	of meters (multicast). d) Two-way communication with meter/ DCU e) Signals for connect & disconnect of switches present in end points such as meters. This facility shall be provided for both single meter (unicast) as well as for a group of meters (multicast). f) Audit trail and Event & Alarm Logging g) Ability to redirect messages including configuration commands from the MDM in order to reach the desired meter h) Maintain time sync with DCU / meter i) HES shall hold data for a minimum of 45 days. j) Handling of Control signals / event messages on priority k) Manage time distribution to ensure that nodes / meters always have an accurate RTC using NTP servers. The time distribution mechanism shall take into account the network latencies. l) Setting of Smart Meter configurable parameters m) Critical and non-critical event reporting functionality n) Device management functionality to get periodic updates from devices on health check, hardware &firmware version, location mapping etc. o) AMISP have to develop system maintain service level performance at HES/MDM.
Configuration	HES shall facilitate configuration of following minimum AMI parameters: a) Load profile capture period b) Demand integration period c) Setting of parameters for TOU billing d) Prepaid / post-paid configuration e) Net metering f) Billing date / month-to-date for prepaid meters g) Clock setting/time synchronizations h) Load curtailment limit

Particulars	Description
	i) Event setting for connect/disconnect j) Number of auto reconnection attempt k) Time interval between auto reconnection attempt l) Lock out period for endpoint (meter) relay m) Remote firmware update: It shall be possible to update the firmware of the meters in both Unicast (one to one) and in Multicast fashion (Group of meters). It shall be also possible to have remote firmware upgrade for an individual and a group of nodes (NAN/WAN, Routers/Gateways/Access Point, DCU/Meter. n) Password setting o) Push schedule p) Setting threshold limits for monitored parameters
Communication	a) HES shall communicate with DCUs/Meter/access points using WAN technology b) HES shall encrypt data for secure communication c) HES shall be able to accept data according to IS 15959 part-2 /part 3 and latest amendments d) HES shall automatically retry for missed data; the number of retry attempts shall be configurable e) To receive confirmation on successful execution of a command f) HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data.
Application Profile	• HES shall be able to capture and store data from different devices. It shall have AMI profile for smart meters. • In AMI profile, HES shall support automatic meter reading viz. register data, interval data and event logs on different frequencies. System should have capability to read data on demand from individual

Particulars	Description
	or group of devices. Frequency of data collection is defined in RFP as - Meter Download Parameters and Frequency. • AMI profile shall support two-way communication with smart meters i.e. critical events, alarms, etc. shall be delivered to HES upon its occurrence. • HES shall integrate with MDM and MDM be integrated with other business / operational applications like ERP, GIS and other 3rd party application) • In case of multiple HES, it will require multiple integrations with ERP resulting in complex integration and monitoring. • All the AMI profile for meter operation shall be done by multiple HES. HES will receive command from ERP / Business Application via single MDM interface. • AMI profile shall support collection of missing data and reconcile the missing data with available data • AMI profile shall facilitate over the air firmware upgrades of smart meters individually and in groups. • HES shall be able to identify devices without power in RF mesh network using last gasp feature of the communication device. • AMI profile shall have support of different metering protocols defined in IS16444 and IS15959 part I & part II with its latest amendments. Bidder shall acquire these documents from BIS (Bureau of India Standards)

Particulars	Description
Device management	• HES shall have device management functionality for managing, monitoring and control the field devices including network terminals. • HES shall indicate status summary by device type, hardware & software versions, device IDs, service type etc. • HES shall provide support for importing devices and associated information from third party systems like SAP, GIS, Oracle, etc through MDMS. • HES shall collect and display information that identifies the device as Gateway/ DCU/ Router, Access Point/ Nodes etc.
Dashboard & Reports	HES shall provide information to MDM for building dynamic dashboard (daily, weekly, monthly) static reports to indicate following: • Total number of network Meters, number of live Meters, number of disconnected Meters and possible reason of failure for troubleshooting purpose. • Meter Data corruption identification & its report with reason of the same • Report of Available working network (NBIOT/4g/3g/2g) with signal strength • Meters type categorization, • Firmware version wise categorization • Total number of filed devices connected, data availability, data non-availability • Device type and status wise categorization • Real time and historical information • Other exception reports

Particulars	Description
	These dynamic reports are extracted based on simple and complex logic by the system administrator or users. All the reports, analytics and user interface is through common interface i.e. MDMS in an AMI system. The required data for reports will be provided to MDMS by HES.
Notifications	HES must support notification module for dispatching notifications based on exceptions to MDM and further MDM shall send the notifications to concern user/s via email, SMS. These notifications should be based on the data received from the field devices.
Security Module	• Security module must manage security keys and certificates. System shall be able to report any security breach or unauthorized communication devices logged in. • Security module must have audit trail functionality for managing and storing all the records of activities performed by authorized/unauthorized users. • Bidder must comply with stringent norms of cyber security.
Monitoring and Reporting Capability	• HES shall have critical and non-critical reporting functionality. The critical & non-critical information generated from this reporting functionality shall be made available to MDM at user configurable periodicity.
Critical Reporting	HES shall have alarms and keep record of following events: a) Event log for node's (meter) events such as tamper/power failures etc. b) Data not received from nodes/end points c) Relay does not operate for connect / disconnect

Particulars	Description
	d) Communication link failure with nodes/end points e) Network Failure f) Power Failure
Non-Critical Reporting	HES shall report and keep record of following communication failure events: a) Retry attempts b) Missed periodic reading c) Failure to connect HES shall support reporting of communication failure history of nodes/routers/access points etc. and give an exception report for nodes/routers/access points not communicating for last 0 – 24 hours (the reporting period shall be on user configurable period). HES shall have feature to send email/SMS notification of configured alarms & events to its users.

Annexure F General requirement for common pluggable communication module for Smart Meters

Considering that the new Smart Meters may use different types of communication technologies (RF/PLCC/Cellular, etc.), thus in order to enable different communication modules to be used in the same meter, it is necessary to use a universal interface and a particular size irrespective of the choice of communication technology that defines the dimensions of the communication slot as well as physical placement and location of connectors. The following example recommendations will go a long way in assuring interoperability whilst still complying with the provisions of IS 16444 and IS 15959 standards:

Part I

1. **Recommended Module Placement location**
   In order to improve the Radio Performances of any of the wireless technologies encompassing but not limited to Cellular, RF and / or RF mesh, 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 Field swappable Plug-in Communication module provided by AMISP shall be exclusively for RF and Cellular based communication with the same make of meter & NIC. (i.e., RF NIC can be replaced either by RF NIC or Cellular NIC and Cellular NIC can be replaced either by RF NIC or Cellular NIC).
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.

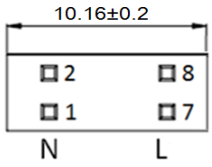
Part II

AC power interface:

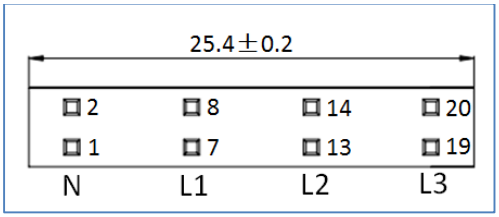
In the event of PLC communication being chosen as the only or one of the choices, the following arrangement of connector and pinouts need to be provisioned on the communication module.

Female connector

1. Front View:

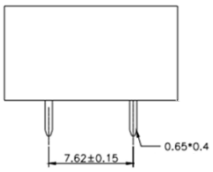


Single phase meter

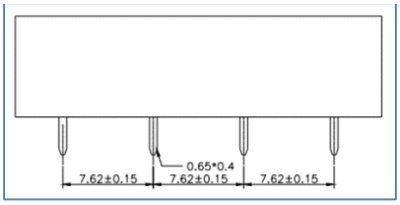


Poly phase meter

2、Top View:

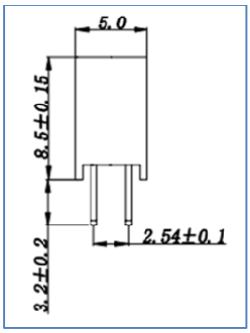


Single phase meter



Poly phase meter

3、Side View:



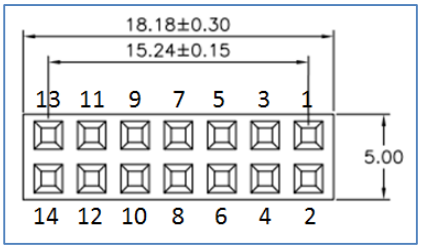
Pin to Pin distance should be: 7.62mm (Standard Pin connector)

Communication interface:

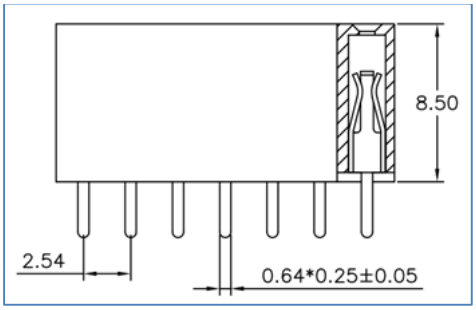
The meter shall have a slot of an appropriate size to allow for the pluggable communication module (such as but not limited to NAN /WAN, dual mode RF, Dual Technology, cellular etc.) to be fit in to the meter. The meter shall provide a 14-pins Female socket connector (2*7pin, 2.54mm). The socket shall 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

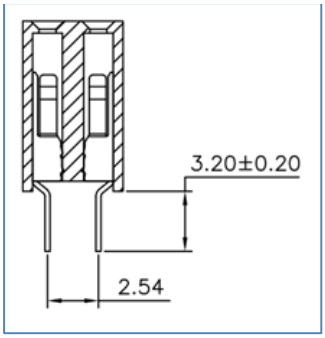
1. Front View：



2. Top View:



3. Side View:



PIN Outs may be provided as per below details

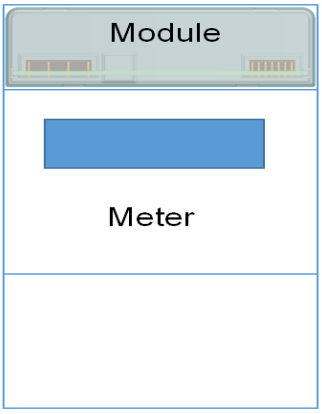
Pin No	Name	Input/output	Description
1	Reserved	/	/
2	Reserved	/	/
3	Power EN	Output	Control the module's power supply
4	Reserved	/	/
5	Reserved	/	/
6	Meter TXD	Output	To Module UART port RXD, Min.38400
7	Meter RXD	Input	From Module UART port TXD, Min.38400
8	Reserved	/	/
9	RTS	Input	Input digital signal 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

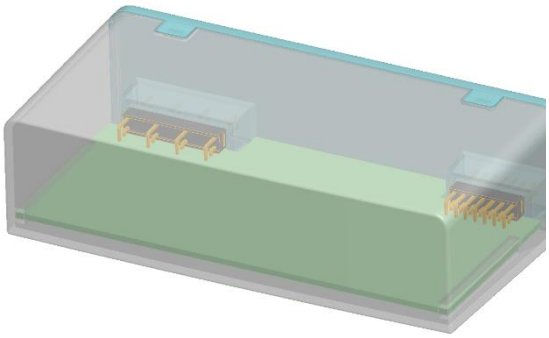
The following reference size may be adhered to irrespective of a single or multiple communication options provisioned on the same module. This standard form factor and dimensions will enable physical and functional interoperability with different makes of meters.

A. Module 3-D views (For Representational Purpose Only)

1. Module in meter (Top View)



2. 3D View

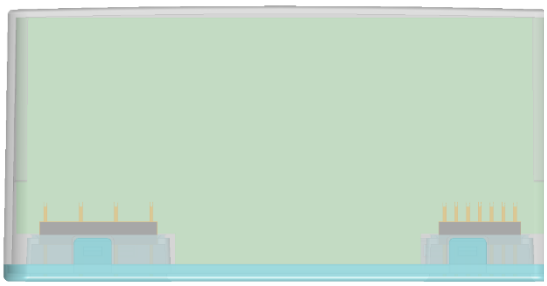


3. Front View

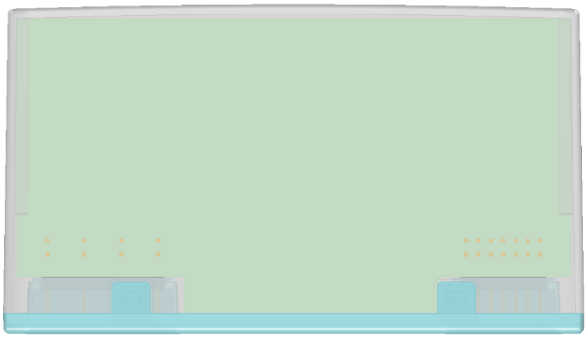
4. Back View

5. Side View

6. Top View

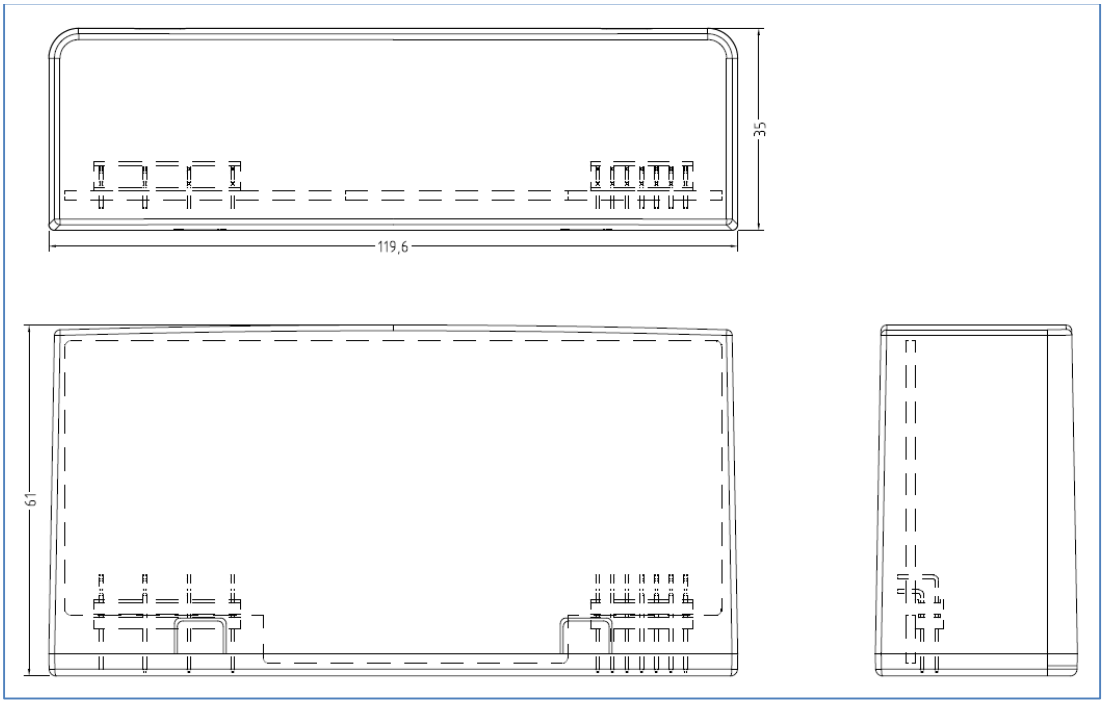


7. Bottom View

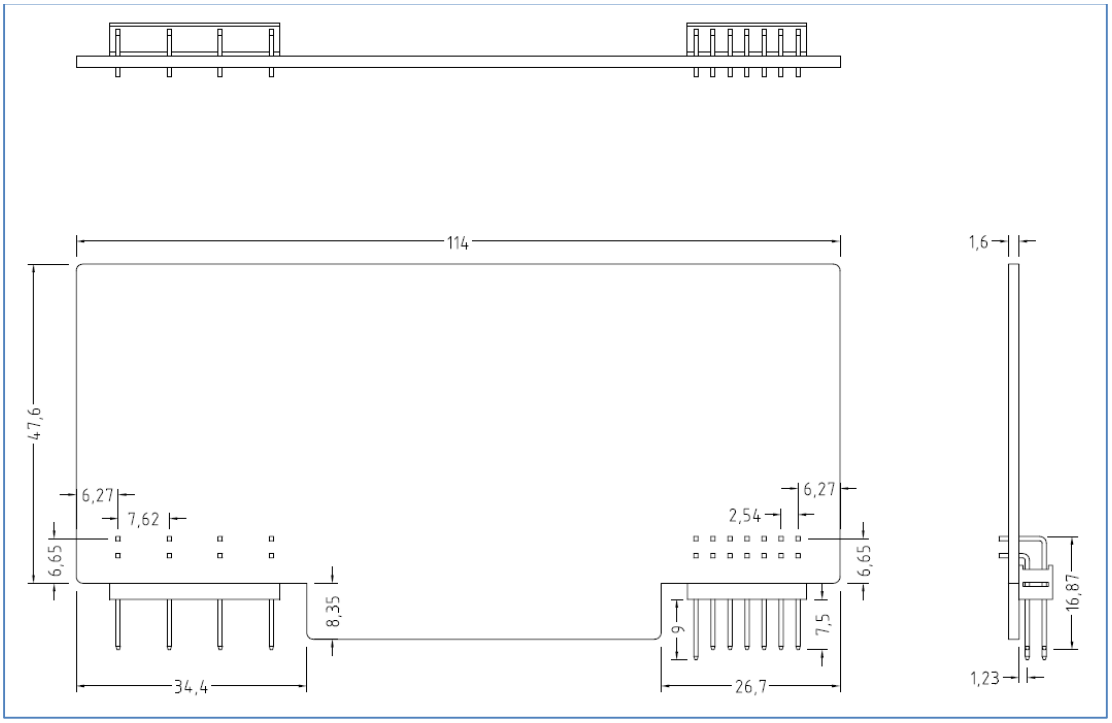


B. Module Dimensions

Overall view of the module:

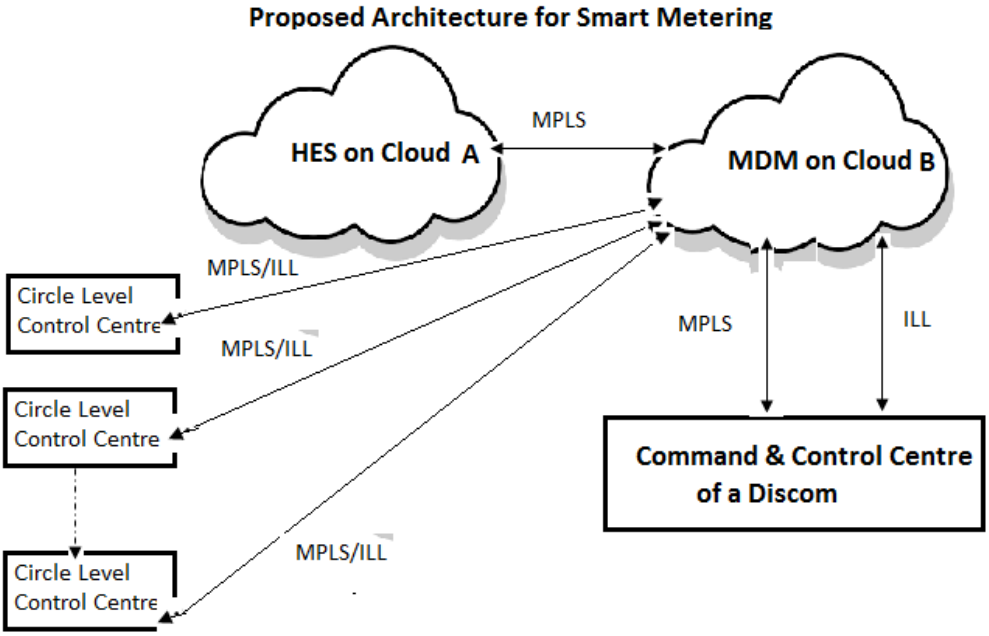


Overall view of the module's PCBA:



Notes: Module Reference Sizes: unit mm.

Annexure G Details of ESB Architecture



Annexure H Future Demand Response Program Use Cases for Reference

The objective of the Demand Response is to optimal utilization of energy resources by uniform distribution of load across the day, to save additional investment in capacity addition within the utility, improved access of power to rural areas, reduction in technical losses, enhanced consumer satisfaction by load curtailment in place of load shedding.

S.No.	Functional requirement	Description of Functional requirement
1.	Load Curtailment event in place of Load Shedding	System will determine based on day ahead schedule for available generation capacity and load forecasting the load curtailment events. Advance notice will be sent to a group of consumers affected by this load curtailment. DR system will send the load curtailment command to the MDM. The MDM will forward this command to the appropriate AMI Head-End.
2.	DR Program Commencement	Once the consumer is set up with all the devices necessary, the consumer details will be sent to DR system. Premium charges for assured power supply with SLA and/or Rebates and incentives can be given to consumers who participate in DR programs.
3.	Real time Pricing	Utility shall be able to send real-time pricing signals to end consumers/ AMI system
4.	Curtailment due to Contract Violation	Utility limits consumer's load due to reasons like exceeding contract load
		Alarms (visual and audio) shall be provided in case of load violation (in home device, Email, SMS etc.). The billing system shall be notified of the load violation, and the corresponding charges shall be applied to consumer (based on tariff rules).
5.	Demand side Management	In every 15-minute interval Meter data should be captured, Confirmation of action taken for demand response should be mentioned as well as monitoring of historical Consumer Load Profile should be done.
6.	Load Monitoring at Demand side	Daily Meter Reading, Status and associated details capturing for records of consumer consumption data, TOU details, real time trends and Load profile Details. Along with this whenever there is a load violation event recorded in the meter, the information is sent to the control center
7.	Initiate Direct Load Control Event	Utility calls a Direct Load Control Event using the Peak Load Management (PLM) Application and executes through head-end by sending a load control signal to Smart Appliances thru HAN/Smart Meter or other means
8.	Energy accounting system	**Register and Interval based accounting:** **Register based** Register based accounting supports requirements for prepaid energy accounting based on register reads. It includes billing cycle data services that deliver billing determinants via an interface to CIS/Billing on the billing cycle date and on request when special reads are required. A Billing Determinant Calculator provides the flexibility to compute the billing determinant values based on utility defined formulas. Formulas are built around logical and arithmetic operators, and can contain other billing determinants, constants, and consumer functions. **Bi-directional**

S.No.	Functional requirement	Description of Functional requirement
		MDM should support bi-directional metering by processing the delivered and received channels for a given meter in two separate channels. **Net Metering** (using Virtual channel) MDM should support net metering by processing the delivered and received channels from the meter/recorder and calculating a net amount. The calculated net will be stored onto a virtual channel. MDM should provide full tracking, management, and storage of usage data related to each data channel. This allows summation of usage data separately for each data channel. **Usage Calculated from Register Reads** MDM can create usage data from register reads received from AMI systems or gathered manually through HHUs. MDM will calculate the difference between the current bill period register read and the previous bill period register read, applying the ratio required converting to the correct kWh usage. Rollover conditions are also considered when computing usage. The calculated usage is stored in the billing table and accessible to all applications that require the data. **Interval Billing**: The Interval Billing should include all of the functionality offered in the Register Billing in addition to support Advanced Billing Determinants (ABD) calculated from interval reads. As interval data is retrieved by the AMI systems, the Advanced Billing Determinant (ABD) engine should process the interval reads into daily and billing cycle usage-based billing determinants (as compared to register-based billing). For example, if 15 min interval data is retrieved by the system, MDM calculates the proper billing determinant which is based on RTP/ Time-of-Use (TOU) tariff, then ABD engine will make this computation based on tariff configuration data in the database. Then it stores this daily data set (RTP/TOU values with usage details for each), along with the interval data in the Metered Usage Data Repository (MUDR). On each billing cycle, the ABD engine will summarize the RTP/TOU and demand data for each period over the requested billing span and deliver these billing determinants to the billing system. By performing the billing determinant summations daily, MDM support end-user presentation of "month-to-date" information as well as spread computational loads over time (including weekends).

Annexure I Conditions/protocols for auto-disconnections

a) Utility will mention for which consumer categories would the protocol for auto-disconnections shall apply and for which consumer categories the same shall not be applicable.

b) The auto-disconnection shall not be allowed during gazetted holiday / national holidays and during night-time.

c) In case, Utility opts for prepaid mode then necessary guidelines shall be issued for auto-disconnection.

Annexure J AMI 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 severity 1 outage.

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

The AMISP shall implement an appropriate online SLA Application (as elaborated in Clause 7.7 of this Section) 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 the Utility towards desired resolution. The incidents (15 in number) are categorized as mentioned in below table.

Category	Incident Description[1]
Severity 1– Urgent	a) Complete loss of AMI system functions[2] b) Partial outage of AMI functions i. Utility user interface ii. Consumer portal c) Stoppage of data backup at DC/DR (refer Clause '7.3.1 e' of this Section) d) Cyber Security issues leading to unauthorized access to systems/applications
Severity 2– Serious	a) Outage at Network Operation cum Monitoring Centre i. Complete outage of communication connectivity ii. Failure of UPS system iii. Failure of Battery / other auxiliary system) b) Interruption of data exchange with utility enterprise systems c) Partial outage of AMI functions i. Outage of VEE ii. Billing Determinants iii. Reports d) Breach of data privacy e) Adherence to RPO / RTO[3] as per Clause 2.7.3.3.9 of this Section and as mentioned in Clause 7.3.1 of this Section

[1]Please note that the table provides the different incidents categorized under different severity levels. If any incident at a higher severity level or order is active, then it shall be understood that a new incident at a lower severity level or order linked to the one at the higher-level incident, shall not be separately registered. For instance, when there is an incident "Complete Outage of AMI system functions" under Severity-1, then "Partial outage of AMI functions" or "Interruption of data exchange with utility enterprise systems" shall not be registered.

[2]A complete outage of AMI functions may happen due to a system level crash or outage of DC/DR infra or outage of MPLS bandwidth at DC/DR

[3]RTO and RPO are expected to be checked once a month for purpose of SLA

Category	Incident Description[1]
Severity 3– Minor	a) Non-availability of reports as per Clause 6.2 of this Section during the Operation Phase b) Resolution of complaint ticket raised and passed on by CCS [These complaints shall be registered within the SLA Application and hence shall have to undergo mutual agreement checks between Utility/AMISP before being registered for resolution] c) Non-availability of required inventory of spares specified in Clause 7.3.3 of this Section d) Failure of workstation, printers, LAN etc. at the NOMC e) Non-availability of designated AMISP's Manpower at the NOMC .

J.1 Response & Resolution Time

The target times within which the AMISP 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 AMISP subject to the maximum time defined in the following table. In case, AMISP doesn't respond within initial response time, the support shall be deemed acknowledged by the AMISP.

b) The Action Resolution Time is the period from the acknowledgement of support request to the AMISP 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	Maximum Action Resolution Time	Action
1	[15 minutes]	[2 hours]	An urgent or emergency situation requiring continuous attention from necessary support staff until system operation is restored.
2	[30 minutes]	[24 Hours]	Attempt to find a solution acceptable to the utility (dependent on reproducibility), as quickly as practical.
3	[2 hours]	[10 days]	Evaluation and action plan. Resolution time is dependent on reproducibility, ability to gather data, and the Utility's prioritization.

J.2 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.

J.3 System Availability Calculations

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-3 events, 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 AMISP to correct the issue

b) Applicable Severity level

c) Time of reporting to the AMISP 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 AMISP'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:

$$\text{Availability per month} = \frac{\text{THM} - (\text{S1 X } 1 + \text{S2 X } 0.8 + \text{S3 X } 0.5)}{\text{THM}}$$

- Where THM is total hours in the month when power supply to AMI system is available
- S1/ S2/ S3 is the total non-available hours in Severity Level-1 /2/3

S1/ S2/ S3 are computed for each event. For instance, S3 for each Severity-3 event would be number of hours passed beyond the maximum resolution time for which the event is not resolved. Some examples for the same are provided below

Category	Example of computing non-available hours
Severity 1– Urgent	For incidents happening for the first time in the month, Number of hours beyond the allowed maximum resolution time for which: a) Complete loss of AMI system functions b) Partial outage of AMI functions i. Utility user interface ii. Consumer portal c) Cyber security issues remain unresolved d) Data backup at DC/DR remains stopped For incidents happening for the second or more times in the month, Number of hours beyond the allowed initial response time for which: a) Complete loss of AMI system functions b) Partial outage of AMI functions i. Utility user interface ii. Consumer portal c) Cyber security issues remain unresolved d) Data backup at DC/DR remains stopped
Severity 2– Serious	For incidents happening for the first time in the month, Number of hours beyond the allowed maximum resolution time for which: a) Outage at Network Operation cum Monitoring Centre i. Complete outage of communication connectivity ii. Failure of UPS system iii. Failure of Battery / other auxiliary system) b) Partial outage of AMI functions i. Outage of VEE ii. Billing Determinants iii. Reports etc. c) Any single event on data privacy breach is not resolved d) Interruption of data exchange with utility enterprise systems remains unresolved e) Adherence to RPO / RTO is not ensured For incidents happening for the second or more times in the month, Number of working hours beyond the allowed initial response time for which a) Outage at Network Operation cum Monitoring Centre i. Complete outage of communication connectivity ii. Failure of UPS system iii. Failure of Battery / other auxiliary system) b) Partial outage of AMI functions i. Outage of VEE ii. Billing Determinants iii. Reports etc. c) Any single event on data privacy breach is not resolved

Category	Example of computing non-available hours
	d) Interruption of data exchange with utility enterprise systems remains unresolved e) Adherence to RPO / RTO is not ensured
Severity 3– Minor	Number of days beyond 10 days for which (Number of days shall be converted to number of hours by multiplying it with 24) a) Non-availability of reports as per Clause 6.2 of this Section during the Operation Phase b) Resolution of complaint ticket raised and passed on by CCS [These complaints shall be registered within the SLA Application and hence shall have to undergo mutual agreement checks between Utility/AMISP before being registered for resolution] c) Non-availability of required inventory of spares specified in Clause 7.3.3 of this Section d) Failure of workstation, printers, LAN etc. at the NOMC e) Non-availability of designated AMISP's Manpower at the NOMC

Annexure K

Schedule of billing data collection for different consumer category

The schedule for billing for various consumers on which the current AMI system (procured under this contract) is implemented is provided below:

Consumer category	Billing schedule
Domestic	Monthly
Non-domestic	Monthly
LT industry	Monthly
HT	Monthly
Public W/w/ ST- HT and LT	Monthly

~~*Feeder wise and Distribution transformer wise Energy audit schedule is on monthly basis.~~

Annexure L

Integration Interface of Existing Enterprise Applications

- AMISP shall be responsible for integration of its HES/MDM with following system as per utility requirements:
    - Billing system
    - Discom MDM/ Enterprise service bus/any Centralize repository

- The Meter Data Management System supports storage, archiving, retrieval & analysis of meter Data and various other MIS along with validation & verification algorithms. It acts as a central data repository.
- MDM can 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. It can provide validated data for upstream systems such as billing, consumer Information system, customer care, analytics, reporting, Network planning & analysis, load analysis/forecasting, Outage management etc.
- The proposed MDM shall be DLMS Compliant.
- Bidder shall specify and deliver an initial system that supports the collection and storage of data for meeting the performance level for the smart meters.
- 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).
- MDM shall be operated by the representatives of discoms and AMISP will be deploy resources at Corporate level and can be part of the Command and Control Center team so that AMISP is aware of the daily AMI operational activities. It shall be noted that AMISP shall also act as adviser to the discom related to increasing the operational efficiency of the MDM. MDM has been hosted in cloud.
- The AMISP shall be responsible for proper data exchange among Smart meters, HES and other operational/ requisite software as part of fully functional AMI system including MDM and billing solution.
- The HES shall generate MIS / Dashboard / Reports regarding numbers of meters read / unread on daily / weekly/ monthly and AMISP has to ensure seamless integration with MDM and data available on MDM will be the basis for the calculation of SLA.
- In case, data is not available on MDM and reason is not attributed from HES level then after due approval from Utility, calculation of SLA will be done on the data available on HES.
- In case the MDM is unable to perform the tasks as given in subsequent sections, the AMISP shall develop AMI system to deliver the Discom specific tasks.

1.1. Asset Management

- Maintains 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.
- 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.
- Ability to report and log any damage / deterioration in the meter attributable to consumer /utility.

1.2. AMI Installation Support

- The MDM shall support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDM generates exceptions for smart meter or OTT modules not delivering the correct meter data after installation.
- The MDM provides a reconciliation report that identifies the meters that have been installed but not communicating for a designated period. MDM generates reports on the number of meters installed in comparison to the number of meters successfully communicating.

1.3. Meter Data

- The MDM accept input, process, store, and analyse Meter data from HES and meter data collected through handheld meter reading instruments and manual meter reads.
- It accepts input, process, store, and analyse non-billing meter data such as voltage and power quality data (like under/over voltage etc.) as they are available from AMI Head End Systems.
- It shall provide storage of all collected Meter Data, events and alarm for 5 years or more via archiving.
- Correctly track & resolve energy usage across meter changes with no loss of individual meter data.
- Provide complete history and audit trail for all data collected from meters including commands sent to meters and other devices
- Execute on-demand read processes.
- Handle special metering configurations like net metering/multiple meters at same premises.
- It should have the ability to manage a minimum 15-minute interval data.

1.4. Data Validation, Estimation, and Editing (VEE)

- The validation and estimation of metered data is based on standard estimation methods.

- "The MDM supports and maintains the following data:
    - Registered Read Data including register reads, daily billing cycle, as well as derived billing determinants like TOU.
    - Interval Data channels with variable intervals and variable units of measure
    - Calculated data that is derived or computed such as billing determinants and aggregated loads.
    - Event data storage of all collected event and alarm data from meters, network equipment, and MDMS itself"
- MDM flags, alarms and triggers an estimating process including but not limited to when the following anomalies occur in the cumulative ("CUM") register reads, Time of Use (TOU) register reads and Demand register reads.
- MDM rule engine validates the data received from meter -IP/LS/Billing/Event- and rules are configurable as per the utility/user convenience.
- It should maintain both the original received raw data in a non-manipulated state, in addition to VEE data.
- Notwithstanding the latency of data collection via the AMI system, once the MDM receives meter read data, the VEE process occurs in real-time and the post-VEE data is then immediately available to user or external systems.
- The MDM can automatically flag data changes from manual edits, VEE (Validating, Editing and Estimating) rules and data source corrections and electronically generate audit trail with timestamps and user-ids.

1.5. Billing Determinants Calculations

- It allows configuring multiple TOU/TOD options (e.g. the number and duration of TOU rate periods) by customer type, tariffs and day type (weekend, weekdays, and holidays) and by season.
- "Supports the processing of interval data into billing determinants to include the following at a minimum:
    - Total Consumption
    - Consumption in different time blocks for ToU billing
    - Maximum Demand (in kW and kVA)
    - Number of tamper counts
    - Average power factor"
- Processes interval data and frame, it into the appropriate TOU periods for consumption and demand; for example, roll up 1/15/30-minute data intervals into hourly data.
- Ability to properly account for special metering situations such as check metering, sub metering, prepaid metering and net metering when calculating billing determinants and sending them to billing and other systems.

1.6. Exception Management

- 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.
- Ability to group, prioritize, filter and send system generated alarms and events to predetermined email addresses, cellular text messages to phone numbers/SMS/customer care etc.
- " Exception Generation - Generates exceptions based on configurable business rules including but not limited to the following:
    - Meter tamper alerts
    - Communication module health alerts for Meter/DCU
    - If the consumption is less/more than pre-defined average consumption
    - Negative Consumption (not for net-metering)
    - Power outage indications received from the Smart meter"

1.7. Service Orders

- Generates service orders based on configurable rules for various events and alarms such as stop meter, tampers, problem in communication networks, AMI host server, etc.
- Sends service orders via SMS, email, etc. with the email addresses / phone numbers being configurable.

1.8. Customer Service Support

- Provides customers with access to current and historical consumption and interval data, outage flags, voltage and power quality indications in graphical and tabular form depending on user choice.
- MDM supports email/SMS notification of configured alarms & events to configured users.
- The MDM is a web portal and have the ability to interface with the 3rd party portal/utility portal to provide the consumer near real time online views of both usage and cost and helping consumers to understand electricity usage and cost information, alerts and notifications and energy savings tips with different levels of detail. The portal also enables the user to view the past electricity usage, last week's, yesterday's, current days or other period etc. as per selection.

1.9. Reporting & Analytics

The MDM shall have the capability of configuring business rules including but not limited to the following:

- Display consumption/load profiles by configurable period (15/30 min, hour, day, month, year etc.) day type (weekday, weekend, holiday, festival wise etc.) and by tariff, customer type, or any user specified collection of meters.
- Generate peak & off-peak load patterns by aggregating all loads of DT/Feeder/consumer group.

- Perform DT/feeder wise real-time energy audit.
- Perform load analysis for different groups and categories of consumers.
- Provide the data to load forecasting, load research or demand response applications and perform error management like: Missed reads and intermittent meter reads before taking into forecasting, load research or demand response
- Identify & visualize poor performing assets like feeder/distribution transformer on multiple criteria like energy losses, collection losses, billing losses, outage duration etc. and generates appropriate colour coding
- Ability to configure the system to effectively visualize consumption trends, identify unusual patterns, and visualize load analysis to understand which assets are being over utilized.
- Analysing data to identify new patterns of usage, transformer overload alerts / demand–supply gap alert etc.
- Ability to receive and store outage and restoration event data from smart meters and outage systems and to log all such events for analysis.
- "MDM including but not limited to following:
    - Daily data collection report
    - Usage exceptions
    - VEE validation failures
    - Missing interval Read date and times (on hourly, daily, weekly & monthly basis)
    - Physical meter events (install, remove, connect, disconnect) & meter reset report
    - Meter flags
    - Meter inventory
    - Defective meters
    - AMI performance measurements
    - Threshold Exception
- All MDM reports are in standard digital format such as PDF, Excel, etc.
- Ability for GUI (Graphical User Interface) to set up or change report delivery to configurable email addresses, network file directories, ftp sites or printer systems without modifying source program code and without any proprietary language skills.
- All queries can be generated through user driven drop down menu in GUI."
- Ability to provide daily & weekly interface exception reports between MDM and other subsystems e.g. billing, outage, etc.
- In case more than one technology of AMI (example GPRS, Ethernet and RF between Smart Meter & DCU) deployed in the field The MDM shall generate report on the performance and availability of data being delivered per AMI technology.

The above-mentioned requirement is not exhaustive. In case of need of additional reports, the bidder shall make provision for such reports without additional cost implication to the owner.

1.10. Revenue Protection Support

- Ability to analyse 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.
- The business rules for revenue protection alerts are configurable via user-friendly interface.
- Can filter out revenue protection alerts that may be caused by field activities if the field activity information is provided to the MDM.
- Support the analytics/investigation (i.e. view current and historical usage patterns) to valid suspected revenue protection issues.

1.11. Net Metering

MDM flags, alarm and trigger an estimating process including but not limited to when the following anomalies occur:

- CUM decrements of forward energy within a billing cycle
- Register decrements for Time of Use (ToU) of forward energy
- Power generated(exported) by any net-metering consumer more than the installed capacity of solar PV rooftop system
- Energy exported (exported) in any given day by any net-metering consumer more than the programmable threshold value.

1.12. Prepaid metering

The prepaid functionality can either be availed at smart meter level or through MDM. In case of MDM, following are the features

- The MDM supports pre-payment metering and capability to interface with pre-payment application.
- Payment and connection parameters are stored centrally, and the details are being updated to consumer portal/ app.
- The system Periodically monitors the energy consumption of prepaid consumer and decrease the available credit based on consumption.
- The system sends connect/disconnect command on the basis of available credit as per notified rules & regulations.
- System sends low-credit notifications to the consumer when their balance approaches a threshold.
- User interface for all authorized consumers have the following functionality:
    - View metered data, initiate and view reports
    - View data according to Time of Use (ToU) tariff
    - Can make request for connection/disconnection
    - User can update mobile number/email
    - Can initiate service requests for maximum demand updating, meter checking etc.
    - In case on net-metering consumers, user can view data for both import & export

- In case of prepaid consumers, consumers can view recharge history & present balance.
- Prepaid consumers shall be provided facility to recharge their account by logging on user interface. User interface shall require consumer id., mobile number & password for secure login. This user interface shall be integrated with the present online payment gateway of utility.

1.13. Integration with other Systems

- MDM supports the interface with other systems on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968/IS15959/ Indian Companion Specification/ any other open standard. MDM solution is adhering to Service Oriented Architecture (SOA).
- It supports the interfacing of other smart grid functionalities like Distribution Transformer Health Monitoring system, self-healing system, SCADA, Home automation, Utility Billing system, OMS etc. using following technologies: over MODBUS, TCP/IP etc.
- MDM integration with other systems shall include but not limited to the following:
  - HES for data exchange from other AMI solutions
  - Utility Administration
  - Existing other Data Collection Systems
  - IVR system, CRM, Consumer Portal
  - Billing and collection system
  - GIS Systems integration with CIS and with MDM system
  - Support of interface with HHU or manual reading system etc.

Salient feature of Discom Peak Load Management/ Demand Response Module

Peak Load Management shall be implemented in the project area with the motive of enabling the utility to carry out Demand Response (DR) for all the consumers covered under AMI. This specification indicates the overall structure and functional requirements of the PLM software solution.

1.14. Scope

The broad scope of the bidder, for implementation of Peak Load Management shall inter-alia include:

- **Analytics & Visualization**
  - Daily load forecasting with 15-minute granularity for the project area on hourly/weekly/monthly basis
  - Demand-supply evaluation based on load forecast & supply information
- **Program Management**
  - Creation of a new DR program
  - Setting up eligibility, incentives, timings, etc. for new programs
  - Enrolment / Disenrollment of consumers in individual programs

- Response analysis for each program (consumer wise, category wise etc.)
- Generate monthly reports for performance (program wise, consumer wise etc.)
- Generate billing information based on incentive mechanism if any of individual program and provide to billing system

- **User / Consumer Portal**
  - Integrate with AMI consumer portal
  - Information of schemes, billing, monthly reports etc.
  - Generate requests for enroll / dis-enroll
  - Notification settings
- **Data / information exchange**
  - Exchange with MDMS: user data, max. Demand settings, billing, connection / disconnection commands etc.
  - Integration with consumer / user portal
  - Inputs from master user terminals (utility staff) for program creation, authorization etc.
  - Power supply information from scheduling software or Load Dispatch Centre data

The above requirements shall be met as discussed in the corresponding sections of this specification. The overall program shall ensure intuitive user interface to facilitate ease of use.

1.15. Analytics & Visualization

This section broadly discusses the analytics that shall be carried out by the PLM software along with the visualization requirement.

1.16. Load Forecasting

Load forecasting, being a fundamental requirement for load management, shall be carried out by the PLM software. Hourly load forecast shall be generated for the project area in different time domains as below:

- Short term
- Medium term

The program shall be so designed to generate repeatable forecasts based on multiple inputs including but not limited to the following:

a. Real time and historical consumption data from AMI
b. Weather information
c. Updated status of connected load
d. Holidays, festivals, weekends, special events etc.
e. Energy prices

It shall facilitate aggregating load forecast for user definable consumer groups and levels such as DT level, feeder level, participant of a certain PLM program etc.

Forecasts shall be generated with three or more models (based on different algorithms) for Feeder/DTR defined in the system and user shall have the option to view each forecast and choose any one of those. There shall be provision to view multiple forecasts and the actual load demand

(real time or historical) on the same window to get a clear comparison. Suitable variations in colour and style shall be incorporated when displaying multiple curves on the same plot to ensure conveniently distinctive display.

The forecasts shall be generated by the system on user demand (at any instant) as well as a regular interval (settable with minimum 1-hour period). The system shall be designed to improve upon by learning with the deviations observed in real time as appropriate. If large deviations are observed in any time window, exception reports shall be generated, distinctly identifying the inputs and assumptions considered in generation of the forecast and percentage deviation. Necessary configurability shall be provided for this facility.

All forecasts and actual load demand shall be archived for at least one (1) year period. It shall be conveniently possible for the user to view historical results with percentage accuracy by selecting time window, forecast model and consumer group.

The prediction shall be carried out based on past experience of similar events. The system shall be able to calculate the difference between the actual load reduction and the predicted load reduction for an individual consumer / consumer group/ entire project area. Such results shall be incorporated to refine the predictions in future events.

1.17. Demand-Supply Evaluation

The main purpose of PLM is to ensure demand supply match while avoiding load shedding as well as increased prices. Thus, the PLM software shall fetch the supply status from scheduling system and load forecasts from the internal forecasting system. Based on the two, demand-supply gap shall be estimated and displayed in a graphical form, on day-ahead basis. Also, the information should be available in tabular form which may be exported as MS Excel file.

1.18. Consumer Profiling

Peak Load Management is highly dependent on consumer participation and establishment of correlations that may not be easily evident from raw data. For the said purpose, it is required that the PLM system shall allow consumer grouping on various criteria as desired by the user. It should be possible for the user to create any new consumer group/tag based on DT, feeder, connected load, type of consumer, geographical location, participants of a certain program or any such criteria and to delete existing groups. Further, any consumer may be added to any number of consumer groups/tags by the user. It shall be possible for any analytics or visualization of PLM, related to consumers, to be aggregated at the level of these consumer groups/tags.

For each consumer, a profile shall be maintained, integrated with the AMI system containing, inter alia, information of the involvement of consumer in PLM programs and past responses. This shall facilitate the user to assess the response of any particular group of consumers in PLM programs and thus understand consumer behavior.

It should also be possible to view the aggregated load profile of any consumer group to plan PLM programs in a better way. It shall also facilitate comparison of load profile for different consumer groups or of the entire project area by viewing multiple profiles on the same plot.

The program shall also be able to rank the consumers in each group based on criteria such as monthly energy consumption, participation in PLM programs, monetary incentives gained etc. This shall facilitate the utility in consumer awareness and motivation programs.

1.19. Assessment of DR resources / potential

PLM program shall evaluate the total reduction in load that is possible from PLM based on several factors such as:

- Various DR programs created by the utility
- Number of consumers enrolled in the DR programs
- Previous response of consumers to DR events

The assessment of PLM potential shall assist the user in decision making for running DR events to handle the estimated demand supply gap.

1.20. Role based authorization

The PLM software shall have secured password-based user authentication system. The available information and authority for each user shall be pre-defined role based. Thus, different views shall be available to control room staff, program designer, approving authority etc. The details of this shall be finalized during installation in consultation with the utility.

1.21. Program Management

Peak Load Management shall be carried out at the utility through consumers participating in various Demand Response programs. The PLM system shall allow consumers to simultaneously participate in multiple DR programs, subject to fulfilment of eligibility. The PLM software shall thus be designed for enabling the utility to create and manage these DR programs in an efficient manner.

1.22. Creation of DR Program

It should be possible for the utility staff to create new DR programs by entering the necessary inputs such as:

- Applicable consumers for the program (based on consumer groups)
- Eligibility of consumers (any special conditions)
- Category of program
    - Contracted (Voluntary)
    - Forced
- Incentive Mechanism if any can be defined by the user based on program type such as:
    - Rupees per kW demand reduction per hour
    - Rupees for percentage of demand reduction per hour
    - Monthly fix incentive for kW*hr of contracted demand reduction
    - Monthly fix incentive for forced demand reduction
    - Fine/penalty for violation of contract: fixed component & kW*hr of demand violation

- Any maximum limit on monthly incentive per program per consumer per unit connected load

1.23. Approving Rights

The approving rights for PLM programs shall be allotted to different users in a hierarchical manner for sensitive activities such as:

- Enrolment / Dis-enrolment of consumers in a program
- Approval of program definition
- Approval for running an event-based PLM program
- Approval for closure of a program

1.24. Violation Monitoring

DR program shall monitor violations of load limits in real time and generate notifications. It should be possible to make changes in notification settings by the user to handle large number of violations. Also, a record for all violations shall be maintained consumer wise as well as program wise. Logics will be decided in consultation with discom.

1.25. Incentive Mechanism, if any prevailing in Discom

The incentives of each consumer shall be calculated independently for each program, he/she has participated in, based on the incentive mechanism, if any as defined for the program. The overall benefits shall then be aggregated per consumer for all the PLM programs and shall be passed on to the main billing system/application.

1.26. Response Analysis and Resource Assessment

The PLM system shall enable the user to analyse performance of any of its programs based on commercial data from incentive system and historical load reduction achieved from the program in various time spans. Also, the system shall be able to generate the response summary for each consumer to PLM events and it shall be able to give an outlook on the aggregated response of a particular consumer group.

Further, based on necessary inputs from the utility, the PLM system shall be able to estimate the program-wise and consumer-wise carbon footprint avoided by efficient load management. The above information shall assist the utility to assess the success of a program and design new programs for better impact.

1.27. Customer Portal & Mobile App

Customer Portal solution shall be based on Web as well as Mobile based native apps that provide on-line two-way communication between utility and its customers. The solution shall integrate via a user-friendly graphical interface. It shall provide for self service capabilities like usage management, billing, service requests, participation in energy efficiency programs etc. Features shall include:

- The consumer portal solution shall provide customers with access to current and historical consumption and interval data, outage flags, voltage and power quality indications for selected period.
- The portal/MDM shall support communication preferences for notification via email/SMS of configured alarms & events to selected users.
- The web portal or 3rd party portal/utility portal 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. The portal should support the view for past electricity usage, last week's, yesterdays, current days or other period etc. as per selection. The portal should provide user friendly access to consumer for their data via colourful graphs and charts and can download the data into a spreadsheet.
- Consumer mobile app through which consumer shall be able to log in through android (Android version 12 or latest) /iOS/Window based native mobile app to see information related to its energy consumption. App shall also provide platform for implementation of peak load management functionality by providing existing tariff & incentives rates, participation options etc.
- Provide cross-browser compliant software (compatible with Internet Explorer, Chrome, Firefox, and Safari)
- The portal shall be linked to the on-line payment facility and gateway of the utility.
- Pre-paid consumers shall be provided facility to recharge their account
- Shall support the utility and in turn its customers with a system for logging, managing, and communicating technical issues.

User interface to consumer portal to access consumer's data from MDM for all authorized consumers shall have ability for at least the following functionality:

- The UI of the Portal shall allow selection of preferred language for dialogue like English, Hindi or any Local language
- View metered data, initiate and view reports
- View data according to Time of Use (ToU) tariff
- Can make request for connection/disconnection
- User can update mobile number/email
- Can initiate service requests for maximum demand updating, meter checking etc.
- In case on net-metering consumers, user can view data for both import & export
- In case of prepaid consumers, consumers can view recharge history & present balance.
- User interface shall require consumer id., mobile number & password for secure login.

Software patches, updates, and minor version upgrades, when they become available for general release, should be part of ongoing support and maintenance services

Further, Customer interface mobile app and new Connection /Meter Replacement Mobile App is within the AMISP scope.

The AMISP shall design mobile app for managing field operations such as replacement of meter, new meter installation etc. & Inventory Management. Asset life cycle management shall be done by AMISP and operational parameters to track meter from issue from store to installation/ dismantle shall be included in the proposed mobile app under the scope of AMISP. The mobile app shall be designed to take photographs of the meter installation with Geo-tag for verification of the installation. The workflow and parameters shall be discussed with the Utility. A web application and mobile app to be prepared by AMISP for redressal of complaints (if any) regarding damage of meters/ any associated issue. Logins to be provided to field officers and Smart Metering Cell.

- Bidder shall provide android (Android version 12 or latest) based mobile app for entering the required data, capturing the inputs, etc.
- The App shall have Login authentication via its central database
- For new service connection or Meter replacement, Mobile apps should be able to capture various Consumer/Meter information viz name, Address, sanction load, meter serial no., old meter details, SR-FR, Photographs (Old & New Meter, sealing, M-Seal etc), Connected DTR, Feeder etc.
- The Latitude Longitude coordinates of the meter shall be automatically updated based on the GPS location.
- The module shall facilitate the field executive in accurately mapping DTR or feeder details as per the actual site data. Provision shall be provided to update, edit/relocate or modify any asset captured.
- Mobile device should facilitate bidirectional communication with the central server using standard mobile network (GPRS/EDGE/2G/3G/4G/LTE etc.) and should update the data directly or through interfaces into MDM
- Agency shall be able to Load the meter details/ Consumer Master Information into the Smart Phone online via WIFI/GPRS. The data should not be stored in the local database.
- Once the details are captured, same should automatically sync with the central database.
- The App should allow auto and manual entry of meter updates
- The device software shall have options to capture the photo of the meter.
- Provision to Add/Modify/Delete the consumer meter/asset information like the meter make, status of meters, supply information etc.
- The app should be integrated with a thermal printer and shall have “Printer setup” option
- The app should be able to give on the spot print of the new connection to the consumer. It has an option to print multiple no. of copies in case required
- The app shall support Reprint option in case of an event where the print was not taken at the consumer premise initially.
- The app shall capture initial Phase and Neutral Current Value (Single Phase Meter) and V1, V2, V3 and I1,I2, I3 value(Three Phase meter) at time of installation.

Annexure M

Guidelines for Technical demonstration for evaluation by Discom

Technical demonstration guidelines

A. General guidelines for demonstration

1. **The Bidder shall arrive at the Discom venue with the following requirements:**
   a) **Declaration related to Live demonstration to be filled and submitted by the Bidder at the time of demonstration.**
   b) **Demonstration format as given below will be filled at the time of demonstration**.
2. Maximum of 03 representatives shall be allowed to provide aforesaid demonstration. In case, the Bidder desires his communication partner to participate in the demonstration, it may be part of the team of 03 representatives.
3. Bidder will provide:
   i. 03 different makes of Smart meter with 3 different category i.e. 1 Single Phase, 1 Three Phase and 1 three Phase LTCT and one OEM make of Three phase CT/PT operated HT ~~feeder~~ meter i.e. total 10 Nos Smart Meter (they should be IS:16444 marked) along with communication module. OEM of these meters must comply OEM qualifications as specified in RfP along with OEM Authorization. For demonstration, the bidder has to bring three no. of Smart meters (1 single phase, 1 three phase whole current and 1 LTCT meter of different makes per OEM and one OEM make of Three phase CT/PT operated HT ~~feeder~~ meter), as bidder has to select 3 OEMs, you need to bring minimum 09 meters and one OEM make of Three phase CT/PT operated HT~~feeder~~ meter for demonstration. Each meter must comply with all provisions of IS:16444 and marked. The OEM of these meters must comply OEM qualifications as specified in RfP along with OEM Authorization. Please submit documentary evidence related to respective OEM of meter manufacturers at the time of demonstration.
   ii. CMRI/ Mobile App with associated software for enabling verification of smart meter readings.
   iii. Communication reception module/sniffer compatible USB 2.0/ 3.0 or of otherwise (in case of RF only).
4. Minimum 03 different makes of Smart meter with 3 different category i.e. 1 Single Phase, 1 Three Phase and 1 three Phase LTCT total 9 Nos Smart Meter and one OEM make of Three phase CT/PT operated HT ~~feeder~~ meter provided by bidders to be installed in a straight line at different locations with effective arm distance of approximately 35 meters between the meters (in Case of RF) Instantaneous meter reading pooling frequency will be 15 minutes. Meter reading shall be taken for the parameters provided in Section-D. There will be change in physical locations of 3 meters after every 60 minutes at all the 3 locations (in Case of RF). For downloading purpose, Bidder will provide MIS to display the meter readings.
5. CMRI (Common Meter Reading Instrument)/ Mobile App will be used for meter reading and will be checked with the data generated at the HES side.
6. The Committee will connect a load and the parameters will be demonstrated as per Section-D.

7. Bidder will not be allowed to repeat a test in case of failure of a bidder to pass that test. In case of failure of a meter during the demonstration, the Bidder will not be given another chance to replace the meter. Once the testing procedure commences, the Bidder will not be allowed to change the meter. The Committee will paste a sticker on each meter and will be signed by the authorized representative of the Bidder.
8. **If bidder is proposing more than one communication technologies, his meters (need to provide three separate make meters for each technology) have to pass testing for each technology separately. Failure to pass tests in anyone of the proposed technologies shall result in technical disqualification; In case RF communication, you are required to bring Sniffer tool/ Receiver tool or any other device for capturing data packets between meters & HES via air/ Bluetooth/serial port/USB port etc. to the computer/laptop of technical demonstration committee for analysis.**

9. In case the Bidder refuses to sign the test report, technical demonstration committee will record this.
10. In case of any Bidder wants to raise any issue regarding the testing procedure or otherwise, he must do so before committee in writing immediately. **Any complaint raised after 2 hrs. of completion of test shall not be entertained**. The Committee will record the concerns raised by the Bidder in its report. Decision of the demonstration committee shall be final and binding.
11. The Technical demonstration committee will submit report to the Discom evaluation committee for its consideration toward technical evaluation of bid.
12. Testing committee has full power to maintain order at testing site and everyone shall comply with its instructions.
13. Any fraudulent practice by the Bidder or its communication partner during the demonstration will lead to rejection of the bid.
14. Depending on prevailing situation, the demonstration committed can improvise in any of the procedures outlined here to successfully complete the testing procedure. However, sprit of this document should be kept in mind while improvising.

15. The Bidder has to appear before the Technical demonstration committee on the notified date and time, failure to arrive by defined time will result in disqualification of the submitted Bid.

16. In case, the Bidder declares only one communication technology in his bid, then the Bidder has to demonstrate that communication module; in case, the Bidder declares more than one communication technology in his bid, then all the communication technologies will be demonstrated by the Bidder. In case, the Bidder post award of contract, opts for change in communication technology which he feels is important for meeting the SLA, then he has to demonstrate the proposed communication technology and only after successful demonstration, he will be allowed to implement the proposed communication module/ AMI solution. In case Bidder changes the Meter Manufacture at the time of execution of the project which is not demonstrated, then bidder has to demonstrate the particular meter in sense of Metrological testing and end to end testing of the meter with AMI solution to be deployed by the AMISP.

17. Bidder and its consortium partner shall have to demonstrate their AMI solution exclusively in each Discom where they have submitted their bids. The results of Technical demonstration will be exclusive to each Discom and will not impact the bidder's meeting the eligibility criteria and results of the Technical demonstration in other Discoms. For the Technical demonstration, it shall be noted that no time for preparation of technical demonstration will be given by the Discom and the bidder has to prepare its AMI system along with other partners before submission of the Technical bid. The bidder has to submit BIS certificates for all types of meters at the time of technical demonstration apart from LTCT meter and HT ~~Feeder~~ meter which can be submitted during supply of meter after the award of contract. However, bidder has to submit all the three types of meters including LTCT meter and HT ~~Feeder~~ meter for demonstration.

18. In case a bidder is participating in more than one Lot in a particular Discom **with the same consortium/JV partners and the same OEM mix**, and intends to demonstrate **the same technology/platform** for both the lots in a particular Discom, then only a **single common demonstration** shall be conducted and will be considered valid for both the Lots. The bidder shall, however, be required to submit **required format separately with each Lot** at the time of bid submission.

i. CTs for LTCT & HT meter may not be required from bidder's end Discom will provide necessary facility at the time of demonstration.

ii. The sample has to be submitted at time of technical demonstration.

Demonstration of HT and LTCT meters is required to establish interoperability, system capability, integration scope (Feeder and DT)and end-to-end AMI solution readiness.

B. Details of the communication network test: (In case of RF Communication)

1. The Bidder will provide minimum 03 different makes of Smart meter with 3 different category i.e 1 Single Phase, 1 Three Phase and 1 three Phase LTCT total 9 Nos Smart Meter and one OEM make of Three phase CT/PT operated HT ~~feeder~~ meter (they should be IS:16444 marked) for the purpose of testing of communication protocol. The Bidder in consultation with his communication provider, if any, shall submit a receiver/sniffer compatible with USB 2.0/3.0 or otherwise. This receiver module will be used to analyze the air packet communication with/between the meters provided for testing. Bidder shall also provide any required middleware (any software needed to establish connection between provided receiver/sniffer and computer system of testing committee) needed to read such packet by computer system of testing committee. Configuration of receiver/sniffer/meter/ middleware shall be sole responsibility of bidder's team as to enable required tests to be successfully completed. This receiver/sniffer will be in addition to the RF NIC already available with the meter.
2. The meters will be read one-by-one and the printout of the WireShark package will be kept for the record purpose. After this the same procedure will be repeated when meters are installed in straight line.

    i. Keys – In order to see the encrypted data, encryption key will be required from bidder so that RF mesh communication between meters can be captured and seen after decrypting against various parameters.

    ii. The communication layer protocol as per IS:16444 to be checked:

        a) Application IS 15959 (Part I) and IS 15959 (Part 2)

        b) Transport TCP/UDP

        c) Network IPv6 RPL

        d) Adaptation 6LoWPAN RFC (6282)

3. The report prepared during demonstration will be printed and signed by the authorized representative of the Bidder and members of the technical demonstration committee.

C. Live demonstration of meters and communication network

Table 1: General information

Particulars	Description
Name of the Bidder	
Details of Communication partner	

Table 2: Technical summary of the AMI solution

Particulars	Description
Communication technology	
Name of communication service provider (In case cellular communication, demonstration shall be done with two (2) different Telecom service provider).	
Name of HES provider	
Name of other partners/vendors with name of their service/product (used during demonstration)	
Gateway serial number, if applicable	
WPC certificate to be attached (in case of RF)	

Table 3: Technical parameters demonstrated by the AMI solution

Metering

Particulars	Meter Make –			Meter Make –			Meter Make –			Meter Make –
	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	HT meter
Make of the meter and Sr.No.										
Name plate rating of the meter										

*Note: one OEM make of Three phase CT/PT feeder meter will be placed accordingly.

D. Live demonstration test case [Please attach relevant data sheets along with the report]. [Applicable for both RF and Cellular]

Case-1: Set of Meter-1 at location A; Set of Meter-2 at location B; Set of Meter-3 at location C; Feeder meter will be placed by Discom accordingly.

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Location of meter (straight line)	Location-A Location-B Location-C									
Testing of communication network/ protocol/ stack using industry standard tool –	Comply/ Not comply (Reference report to be attached)									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Wireshark (in case of RF only)	[To be checked in only one location]									
• Linking of meter to DCU/ Gateway and HES (in case of RF) • Linking of meter to HES, in case of GPRS/NBIoT	Comply/ Not comply (Reference report to be attached)									
Remote connect/ Disconnect of relay switch of meters and their status	Minimum 1 connect/ disconnect at every location in 60 mins (Reference report to be attached)									
Last Gasp / First Breadth as Alert/Event	Comply/ Not comply (Reference report to be attached)									
Instantaneous Parameters (15 minsInterval) as per IS:16444	a) Meter Number b) Real time clock- date and time c) Voltage d) Phase current e) Neutral current f) Signed power factor g) Frequency- Hz h) Apparent Power- KVA i) Active Power- kW									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
	j) Cumulative energy-kWh k) Cumulative energy-kVAh l) Maximum demand-kW m) Maximum demand-kVA n) Cumulative power ON/ Power Failure duration in minutes o) Cumulative tamper count p) Cumulative billing count q) Cumulative programming count									
Block load survey data (15 mins) The values will be checked via CMRI/ Mobile App reading from the meter and HES.	Real time clock- Date and time Average voltage Block energy, kWh Block energy, kVAh									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Billing data with verification of support of history data	kWh, MD with date and time stamping, power factor, bill date. [To be checked in only one location]									
Change in Bill date with CMRI/ Mobile App and HES	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
Net meter conversion	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
Load curtailment	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Meter reading percentage	Minimum 80% reading at common HES/MDM in continuous 3 hours for 15 minutes intervals									
HES basic functionality [To be demonstrated by bidder]	Configuration of DCU/ Meter scheduling, On-demand data fetch and report analytics: Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
Recording of Tamper events	Creation of Tamper event (Power failure): Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Encryption/Decryption mechanism [To be demonstrated by bidder]	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
All parameters found in order as per demonstration	[Yes / No]									
Bidder has demonstrated interoperability	[Yes / No]									

Case-2: Set of Meter -1 at location B; Set of Meter-2 at location C; Set of Meter-3 at location A

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Location of meter (straight line)	Location-B Location-C Location-A									
• Linking of meter to DCU/ Gateway and HES (in case of RF) • Linking of meter to HES, in case of GPRS/NBIoT	Comply/ Not comply (Reference report to be attached)									
Remote connect/ Disconnect of relay switch of meters and their status	Minimum 1 connect/ disconnect at every location in 60 mins (Reference report to be attached)									
Last Gasp / First Breadth as Alert/Event	Comply/ Not comply (Reference report to be attached)									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Instantaneous Parameters (15 minsInterval) as per IS:16444	a) Meter Number b) Real time clock- date and time c) Voltage d) Phase current e) Neutral current f) Signed power factor g) Frequency- Hz h) Apparent Power- KVA i) Active Power- kW j) Cumulative energy- kWh k) Cumulative energy- kVAh l) Maximum demand- kW m) Maximum demand- kVA n) Cumulative power ON/ Power Failure duration in minutes o) Cumulative tamper count p) Cumulative billing count q) Cumulative programming count									
Block load survey data	Real time clock- Date and time									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
The values will be checked via CMRI/ Mobile App reading from the meter and HES.	Average voltage Block energy, kWh Block energy, kVAh									
All parameters found in order as per demonstration	[Yes / No]									
Bidder has demonstrated interoperability	[Yes / No]									

Case-3: Set of Meter Make-1 at location C; Set of MeterMake-2 at location A; Set of Meter Make-3 at location B

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Location of meter (straight line)	Location-C Location-A Location-B									
• Linking of meter to DCU/ Gateway and HES (in case of RF) • Linking of meter to HES, in case of GPRS/NBIoT	Comply/ Not comply (Reference report to be attached)									
Remote connect/ Disconnect of relay switch of meters and their status	Minimum 1 connect/ disconnect at every location in 60 mins (Reference report to be attached)									
Last Gasp / First Breadth as Alert/Event	Comply/ Not comply (Reference report to be attached)									
Instantaneous Parameters (15 minsInterval) as per IS:16444	a) Meter Number b) Real time clock- date and time c) Voltage d) Phase current									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
	e) Neutral current f) Signed power factor g) Frequency- Hz h) Apparent Power- KVA i) Active Power- kW j) Cumulative energy- kWh k) Cumulative energy- kVAh l) Maximum demand- kW m) Maximum demand- kVA n) Cumulative power ON/ Power Failure duration in minutes o) Cumulative tamper count p) Cumulative billing count q) Cumulative programming count									
Block load survey data The values will be checked via CMRI/ Mobile App reading from the meter and HES.	Real time clock- Date and time Average voltage Block energy, kWh Block energy, kVAh									

Particulars	Description/Reference value	Observation/results- (Complied/non-complied)								
		Meter Make –			Meter Make –			Meter Make –		
		1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT	1 Phase	3 Phase	LTCT
Change in LS integration period through HES command	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
Change in Demand integration period through HES command	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
Firmware upgradation via remote	Comply/ Not comply (Reference report to be attached) [To be checked in only one location]									
All parameters found in order as per demonstration	[Yes / No]									
Bidder has demonstrated interoperability	[Yes / No]									

Final recommendation of evaluation committee

Particular	Committee comments
Bidder successfully passed the technical demonstration [Pass / Fail]	

Enclosures - As attached

Signature of Bidder

Name:_____

Designation:_____

Company Name:_____

Name:_____

Designation:_____

Company Name:_____

Name:_____

Designation:_____

Company Name:_____

Signature of all committee members

Bidder format for technical demonstration

A.	**Basic information of bidder**	
i.	Name of bidder Name of the authorized representative	
ii.	Name of the communication partner Name of the authorized representative	
B	**Parameters of different make of meters to be used at the time of technical demonstration**	
i.	Name of meter makes selected by bidder for Demonstration	
ii.	Communication technology proposed	
iii.	Name of communication technology provider	
iv.	Name of telecom services provider (s)	
v.	Name of HES provider	
vi.	Name of NIC provider	
vii	Name of cloud service provider/ in-house	
viii.	Name of other vendors/services providers with their service/products	
C	**Technical details of the proposed system**	
i.	Approach & methodology	
ii.	Proposed system integration/Interface mechanism with HES & MDM	
iii.	Data base details used for proposed solution (HES)	
iv.	End to End Data flow (Meter to HES)- Proposed architecture	
v.	Application and Web server architecture details- HES	
vi.	Network and security architecture details	

Bidder format for technical demonstration

E **Declaration by bidders:**

1. I will provide 03 different makes of Smart meter with 3 different category i.e 1 Single Phase, 1 Three Phase and 1 three Phase LTCT and 1 three phase CT/PT **operated HT ~~feeder~~** meter i.e. total 10 Nos Smart Meter (they should be IS:16444 marked) along with communication module. OEM of these meters must comply OEM qualifications as specified in RfP along with OEM Authorization. The meter selected for testing by the bidder, once testing procedure starts, shall not be allowed to be replaced with any other meter. The Procurer shall keep this meter in their custody after demonstration.

2. **I in consultation with my communication module provider, if any, shall submit a receiver/sniffer compatible with USB 2.0/ 3.0 or otherwise to establish communication with computer of testing committee. This receiver/sniffer module will be used to record the air packet communication between/with the meters provided for testing. I shall also provide necessary middleware and configurations to complete all the tests. This module is in addition to the RF NIC already available with the meter (This is applicable only for RF technology).**

3. I shall provide Network Packet Capture Device for Communication protocol. Testing will be done through WireShark open-source tool, if the technology deployed is RF.

4. I will provide its own MIS for recording and display of desired parameters, explained in this document elsewhere during the demonstration process.

5. I will provide CMRI/ Mobile App with associated software for enabling verification of smart meter readings.

I will provide the Smart meters for the purpose of demonstration which are in full compliance with IS:16444 with latest amendments.

7. The OEM whose meters are being provided for demonstration purposed complies with the criteria of OEM as detailed out in RfP. For this purpose, I will submit the necessary documents to the Procurer.

8. I understand that failure to comply with any above conditions will result in rejection of my bid.

Seal & Signature of authorized representative of the Bidder

Annexure N

Specifications of CT for LT-CT meters

are mentioned in Annexure of Technical Specification of the Smart Meters in this RFP.

1.1. TESTS

1.1.1. TYPE TESTS:

Copies of all type tests as per IS.2705 Part-I and II including short time current & temperature rise tests in NABL accredited laboratory shall be submitted and got approved before commencement of supply.

1.1.2. ROUTINE TESTS:

The supplier shall conduct all the routine tests such as Ratio test, phase angle error test for 0.5 accuracy class as per IS 2705 Part I & II.

1.1.3. ROUTINE TEST:

In accordance with IS:2705, Power frequency test on primary winding shall be carried out ~~after erection on site~~ on sample basis.

1.2. MARKING:

The CTs shall have marking and nameplate as per IS 2705 in addition to class of insulation & ISF. The markings shall be indelible. The nameplate shall be securely fixed to the body of the CT.

1.3. PACKING:

Each CT shall be securely packed to withstand rough handling during transit and storage.

1.4. QUALITY ASSURANCE PLAN:

Immediately on award of contract, the bidder shall prepare detailed quality assurance plan / test procedure identifying the various stages of manufacture, quality checks performed at each stage, raw material inspection and the Customer hold points. The document shall also furnish details of method of checking, inspection and acceptance standards / values and get the approval of Purchaser before proceeding with manufacturing. However, Purchaser shall have right to review the inspection reports, quality checks and results of suppliers in house inspection department which are not Customer hold points and the supplier shall comply with the remarks made by purchaser or his representative on such reviews with regards to further testing, rectification or rejection.

Purchaser reserve the right to send any material out of the supply to any recognized laboratory for testing and the cost of testing shall be borne by the bidder. In case the material is found not in order with the technical requirement / specification, the charges along with any other penalty which may be levied is also to be borne by the bidder. To avoid any complaint the supplier is advised to send his representative to the stores to see that the material sent for testing is being sealed in the presence of bidder's representative.

Annexure O Meter Box Specifications are mentioned in Annexure of Technical Specification of the Smart Meters in this RFP.

Annexure P Meter Box Specifications are mentioned in Annexure of Technical Specification of the Smart Meters in this RFP.

INSPECTION:

1) TEST CHARGES: All test charges incurred towards test checking of the material received in stores shall be borne by the bidder only.
2) The manufacturer shall be responsible to pay penalty of Rs 50,000/- for each occasion at which the fake inspection call has been made or the material is rejected during testing/inspection by the authorized agency/representative of the Purchaser. This penalty would be in addition to the expenses incurred by the Purchaser in deputing the Inspecting Officer, carrying out such inspection.

Annexure Q Seals specifications are mentioned in Annexures of Technical Specification of the Smart Meters in this RFP.

PART II

CONTRACT FORM AND CONDITIONS OF CONTRACT

Contract for

Appointment of AMI Service Provider for Smart Prepaid Metering on DBFOOT basis

Between

[STATE POWER UTILITY]

AND

[SPV incorporated by Selected Bidder][1]

AND

[SELECTED BIDDER]

---

[1]*Notes:*

(i) Applicable only in the event the Utility proposes to incorporate a Special Purpose Vehicle (SPV) by the Selected Bidder for project implementation.

(ii) The provisions in square brackets and/or blank spaces shall be suitably filled post finalisation of the Contract.

Section 7. Contract Form and Conditions of Contract

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III. Special Conditions of Contract **..... 389**

A. Form of Contract

(*Applicable in the event SPV incorporated by Selected Bidder)*

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

BETWEEN:

[Insert name of the Utility] (hereinafter referred to as "**Utility**" which expression shall unless repugnant to the context or meaning thereof include its successors, assigns and permitted substitutes), a company incorporated under the extant provisions of Indian Laws and having its registered office at [Address];

AND

……. <insert the name of the SPV>,a company incorporated in terms of the Companies Act, 2013 having its registered office at……. [Registered address of the Company] (hereinafter referred to as the "**AMISP**" which expression shall unless repugnant to the context or meaning thereof include its successors, assigns and permitted substitutes).

AND

<insert the following if the Selected Bidder identified pursuant to the RFP is Sole Bidder>

……., *<insert the name of Selected Bidder>* having its registered office at……. [Registered address of the Company] (hereinafter referred to as the "**Selected Bidder**" which expression shall unless repugnant to the context or meaning thereof include its successors, assigns and permitted substitutes).

<insert the following in case the Selected Bidder identified pursuant to the RFP is a Consortium>

……. *<insert the name of the Lead Member of the Consortium who is the Selected Bidder>*, having its registered office at……. [Registered address of the Company], the Lead Member acting for and on behalf of the Consortium comprising ……*<insert name of the all the members of the Consortium including the Lead Member>* (hereinafter referred to as the "**Selected Bidder**" which expression shall unless repugnant to the context or meaning thereof include its/ their successors, assigns and permitted substitutes).

WHEREAS the Utility had invited Bids for Appointment of AMI Service Provider for Smart Prepaid Metering on Design Build Finance Own Operate Transfer (DBFOOT) basis (the "Project") through RFP/Tender No. [Tender Details]

WHEAREAS after evaluation of the Bids received from the Bidders, the Utility accepted the Bid of the Selected Bidder, and issued its Letter of Award No. [_____] dated [_____] ("**LOA**") to the Selected Bidder, requiring the Selected Bidder, inter alia, to execute this Contract within the time period prescribed in the RFP.

WHEAREAS the Selected Bidder has since promoted and incorporated such a special purpose vehicle as the AMISP under the Companies Act, 2013 in accordance with the terms of the RFP, and has requested the Utility to accept the AMISP as the entity which shall undertake and perform the

obligations and exercise the rights of the Selected Bidder under the LOA, including the obligation to enter into this Contract for Design Build Finance Own Operate Transfer (DBFOOT) AMI system in the Project area.

WHEAREAS the AMISP, by its letter dated [_____], while representing that it has been promoted by the Selected Bidder for the purposes hereof, joined in the request of the Selected Bidder to the Utility to accept the AMISP as the entity which shall undertake and perform the obligations and exercise the rights of the Selected Bidder including the obligation to enter into this Contract pursuant to the Letter of Award (LOA).

NOW, THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Contract, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the Parties agree as follows:

1. The following documents attached hereto shall be deemed to form an integral part of this Contract:

   (a) The General Conditions of Contract(including Attachment 1 "Fraud and Corruption";
   (b) The Special Conditions of Contract;
   (c) Appendices:

   Appendix A: Project Requirements (AMI System Requirements and Service Level Agreement)

   Appendix B: AMISP Service Charge

   (d) Technical and Financial Bid as submitted by the Selected Bidder

   In the event of any inconsistency between the documents, the following order of precedence shall prevail: the Special Conditions of Contract; the General Conditions of Contract, including amendments thereto […. *Insert reference to amendments*….]; Appendix A and Appendix B; and Technical and Financial Bid as submitted by the Selected Bidder. Any reference to this Contract shall include, where the context permits, a reference to its Appendices also.

IN WITNESS WHEREOF, the AMISP, the Selected Bidder and the Utility, executed these presents and affixed common seals of their respective companies on the Day, Month and Year first mentioned above.

1. Common Seal of Utility has been affixed in my/ our presence pursuant to Board Resolution dated ….....

For Utility

[Signature of Authorized Representative]

….....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]

1. Common Seal of ……. [Name of the Lead Consortium Member/ Sole Bidder], has been affixed in my/ our presence pursuant to Board Resolution dated ….....
   For [Selected Bidder]

[Name of the Lead Consortium Member/ Sole Bidder],
[Signature of Authorized Representative]

….....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]

2. Common Seal of ……. [Name of the AMISP], has been affixed in my/ our presence pursuant to Board Resolution dated ….....
   For AMISP

[Name of the AMISP],
[Signature of Authorized Representative]

….....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]

WITNESS:

1. ……. (Signature) Name
   …….
   Designation….....…….……

2. ……. (Signature) Name
   …….……
   Designation….....……

Attested:

…….
[Signature]
(Notary Public)

Place: ……. Date: …….

B. Form of Contract

(Applicable in the event SPV is not incorporated in the case, when CPSE / PSU or a Subsidiary/ Joint Venture of a CPSE/ PSU is the sole bidder/ lead consortium member)

THIS Contract (hereinafter referred to as "**Contract"**) executed on this ..... [date] day of ..... [month], ... [year]:

BETWEEN

[Insert name of the Utility] (hereinafter referred to as "**Utility**" which expression shall unless repugnant to the context or meaning thereof include its successors, assigns and permitted substitutes), a company incorporated under the extant provisions of Indian Laws and having its registered office at [Address];

AND

……., *<insert the name of Selected Bidder, being the Sole Bidder/ lead consortium member>* having its registered office at……. [Registered address of the Company] (hereinafter referred to as the "**AMISP**" which expression shall unless repugnant to the context or meaning thereof include its successors, assigns and permitted substitutes).

WHEREAS the Utility had invited Bids for Appointment of AMI Service Provider for Smart Metering on Design Build Finance Own Operate Transfer (DBFOOT) basis (the "Project") through RFP/Tender No. [Tender Details]

WHEAREAS after evaluation of the Bids received from the Bidders, the Utility accepted the Bid of the AMISP, and issued its Letter of Award No. [_____] dated [_____] ("**LOA**") to the Selected Bidder, requiring the Selected Bidder, inter alia, to execute this Contract within the time period prescribed in the RFP.

WHEAREAS the AMISP, in accordance with the terms of the RFP, shall undertake and perform the obligations and exercise the rights under the LOA, including the obligation to enter into this Contract for Design Build Finance Own Operate Transfer (DBFOOT) AMI system in the Project area.

NOW, THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Contract, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the Parties agree as follows:

1. The following documents attached hereto shall be deemed to form an integral part of this Contract:

   (a) The General Conditions of Contract(including Attachment 1 "Fraud and Corruption";
   (b) The Special Conditions of Contract;

(c) Appendices:

Appendix A: Project Requirements (AMI System Requirements and Service Level Agreement)

Appendix B: AMISP Service Charge

(d) Technical and Financial Bid as submitted by the Selected Bidder

In the event of any inconsistency between the documents, the following order of precedence shall prevail: the Special Conditions of Contract; the General Conditions of Contract, including amendments thereto [*.... Insert reference to amendments....*]; Appendix A and Appendix B; and Technical and Financial Bid as submitted by the Selected Bidder. Any reference to this Contract shall include, where the context permits, a reference to its Appendices also.

IN WITNESS WHEREOF, the AMISP and the Utility, executed these presents and affixed common seals of their respective companies on the Day, Month and Year first mentioned above.

1. Common Seal of Utility has been affixed in my/ our presence pursuant to Board Resolution dated .....

For Utility

[Signature of Authorized Representative]

.....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]

3. Common Seal of ……. [Name of the Sole Bidder/AMISP], has been affixed in my/ our presence pursuant to Board Resolution dated .....
For [Sole Bidder/ AMISP]

[Name of the AMISP/ Sole Bidder],
[Signature of Authorized Representative]

.....
[Name of the Authorized Representative]
[Designation of the Authorized Representative]

WITNESS:

3. ……. (Signature) Name …….

Designation.....…….……..

4. ……. (Signature) Name ……..……
Designation.....……

Attested:

…….
[Signature]
(Notary Public)

Place: ……. Date: …….

II. General Conditions of Contract

Article/ Clause

1. **Definitions and Interpretations**

(a) Definitions

1.1 In this Contract, unless the context otherwise requires, the following words, expressions and abbreviations shall have the following meanings:

(a) **"Advanced Metering Infrastructure" or "AMI"** means an integrated system of Smart Meters, communication networks and meter data management systems that enables two-way communication between the utilities and consumer premises equipment. The functional blocks of AMI typically include HES — Head End System, WAN — Wide Area Network, NAN — Neighbourhood Area Network, DCU — Data Concentrator Unit / Gateway and HAN — Home Area Network;

(b) **"Advanced Metering Infrastructure Service Provider" or "AMISP"**, means the responsible implementation agency named in **SCC** appointed by Utility for designing, building, financing, owning, operating and transferring the AMI Project in its area of operation upon execution of the Contract subsequent to the Letter of Award referred to in **SCC**;

(c) **"Affected Party"** means any of the AMISP or the Utility whose performance has been affected by an event of Force Majeure or Force Majeure Event;

(d) **"AMISP Service Charge"** means the payment to be made by the Utility to the AMISP in Indian Rupee (INR) per meter per month for each category of meter as indicated in **Appendix B**;

(e) **"Applicable Laws"** shall mean the laws and any other instruments having the force of law in India as they may be issued and in force from time to time;

(f) **"Bid"** means the bid submitted by the Bidder(s) in response to the RFP and shall include the Technical Bid and the Financial Bid;

(g) **"Bidder(s)"** means individual entity or consortium of entities bidding in response to the RFP;

(h) **"Change Order"** shall have the meaning as ascribed thereto in Article 14 of this Contract;

(i) **"Consortium Member"** Any member of the bidding consortium other than the Lead Consortium Member;

(j) **"AMISP Contract" or "Contract"** shall mean this Contract entered into between, the SPV incorporated by the Selected Bidder (if applicable and so indicated in **SCC)**, Selected Bidder(represented by the Lead Member acting for and on behalf of the consortium if the Selected Bidder is a consortium) and the Utility for undertaking the AMI Project and is the legally binding written agreement signed by the Parties and which includes all the attached documents listed in its paragraph 1 of the Form of Contract (the General Conditions (GCC), the Special Conditions (SCC), and the Appendices, Attachments, Annexures etc.).

(k) **"Contract Period" or "Term of the Contract"** shall have the meaning as ascribed thereto in Article 2.1.2 of this Contract;

(l) **"Contract Price"** shall have the meaning as ascribed thereto in Article 5.1 of this Contract;

(m) **"Day"** means a calendar day unless indicated otherwise;

(n) **"Exit Management Period"** shall mean the transition period encompassing the time from the date of termination of the Contract or end of the Contract Period until the date upon which all transition activities/ services are completed by the AMISP;

(o) **"Force Majeure" or "Force Majeure Event"** shall have the meaning as ascribed thereto in Article 9 of this Section;

(p) **"GCC"** means these General Conditions of Contract.

(q) **"Goods"** means any good(s)supplied or to be supplied as a part of the Solution by the AMISP;

(r) **"Independent Valuer"** shall mean a qualified valuer duly registered under Companies (Registered Valuers and Valuation) Rules, 2017 for Plant and Machinery and jointly appointed by the Parties in the event of termination prior to Installation Milestone;

(s) **"Lender"** means the banks, financial institutions, multilateral funding agencies, non-banking financial companies registered with the Reserve Bank of lndia (RBl), insurance companies registered with the lnsurance Regulatory & Development Authority (IRDA), pension funds regulated by the Pension Fund Regulatory & Development Authority (PFRDA), mutual funds registered with Securities & Exchange Board of lndia (SEBI), etc., including their successors and assigns, who have agreed to provide the AMISP with the debt financing, and any

successor banks or financial institutions to whom their interests may be transferred or assigned;

(t) **"Month"** means a calendar month unless indicated otherwise;

(u) **"Operational Go Live"** shall have the meaning ascribed thereto in Clause 9.6 of Section 6;

(v) **"Operational Period"** means the period from the Operational Go-Live till the end of the Contract Period;

(w) **"Project or AMI Project"** means the Utility's AMI Project defined in recital clause in the Contract Form;

(x) **"Project Implementation Schedule"** shall have the meaning ascribed thereto in Clause 12 of Section 6;

(y) **"Request for Proposal" or "RFP"** means the Tender of which the number, name and details have been mentioned in **SCC**, including all its Volumes/ Sections/ Forms/ Annexures/ Appendices etc., for Appointment of AMISP (including all clarification/ addendum/ amendment/ corrigendum/ etc. issued from time to time);

(z) **"Rupees" or "Rs." Or "INR" or "**₹" means Indian Rupees;

(aa) **"SCC"** means the Special Conditions of Contract by which the GCC may be amended or supplemented.

(bb) **"Service(s)" or "Related Service(s)"** means any service(s)performed or to be performed as a part of the Solution by the AMISP;

(cc) **SLA Default Notice means** notice to be issued by the Utility in the event AMISP fails meet any of the criteria specified in the SLA for cumulatively 3 (three) months in past 6 (six) months so as to entitling levy of maximum penalty for such criteria;

(dd) **"Smart Meter"** shall mean and is an ac static watt-hour meter with time of use registers, internal connect and disconnect switches with two-way communication capability. It is designed to measure flow of forward (import) or both forward (import) and reverse (export), store and communicate the same along with other parameters defined in this standard. It shall be remotely accessed for collecting data/events, programming for select parameters *(as defined in IS 16444 including any amendments or modifications to the same from time to time);*

(ee) **"Solution"** shall mean the AMI system implemented in its entirety including but not limited to the designing, financing, supply of hardware, software, transportation, installation, integration, testing, commissioning, operation, maintenance, training and other services by the AMISP;

(ff) **"Termination Payment"** shall have the meaning as ascribed thereto in Article 11 of GCC in Section 7;

(gg) **"Utility"** shall have the same meaning as ascribed to it in the recital clause of the Form of Contract.

(hh) **"Meter-months":** At any point of time, meter-months of the AMI system 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 AMISP, taking into account all Change Orders issued by the Utility

(ii) **"Total Meter-months"**: Total Meter-months of the AMI system is calculated as the product of total number of smart meters installed, integrated and operationalized in the Project (by taking into account all Change Orders issued by the Utility) and 93 (ninety-three) months commencing from Operational Go-Live

(jj) **"Installation Milestone"** shall have the meaning as ascribed thereto in Clause 12 of Section 6;

1.2 In the interpretation of this Contract, unless the context otherwise requires:

(b) Interpretation

1.2.1. Utility, the Selected Bidder, and the AMISP/ Contractor shall individually be referred to as "Party" and collectively as "Parties";

1.2.2. Unless otherwise specified a reference to an Article number is a reference to all of its sub-articles;

1.2.3. Unless otherwise specified a reference to a clause, sub-clause or section is a reference to a clause, sub-clause or section of this Contract including any amendments or modifications to the same from time to time;

1.2.4. A word in the singular includes the plural and a word in the plural includes the singular;

1.2.5. A word importing a gender includes any other gender;

1.2.6. A reference to a person includes a partnership and a body corporate;

1.2.7. A reference to legislation includes legislation repealing, replacing or amending that legislation;

1.2.8. Where a word or phrase is given a particular meaning, it includes the appropriate grammatical forms of that word or phrase which has a corresponding meaning;

1.2.9. In the event of an inconsistency between the terms of the RFP, Bid submitted by the Selected Bidder and the subsequent Contract, the terms of the Contract hereof shall prevail;

1.2.10. Whenever a material or article is specified or described by the name of a particular brand, manufacturer or trademark, the specific item shall be understood as establishing type, function and quality desired. Products of other manufacturers may also be considered, provided sufficient information is furnished so as to enable Utility to determine that the products are equivalent to those named.

1.2.11. No amendment or other variation of this Contract shall be valid unless it is in writing, is dated, expressly refers to this Contract, and is signed by a duly authorised representative of both Utility and the AMISP thereto.

1.2.12. An illustration of the methodology for determining the 'Total Meter-Months' as well as 'Operation and Maintenance Period of the AMI system' is provided in **SCC**.

2. **The Contract**

(a) Effectiveness and Term

2.1. EFFECTIVENESS AND TERM

2.1.1. This Contract shall come into force and effect on the date of execution of the Contract by the Parties;

2.1.2. Unless terminated earlier by either Party or extended by the Utility in accordance with the terms of this Contract, this Contract shall continue in full force and effect until the earlier of (a) 10 (ten) years from the date of execution of the Contract or (b) As soon as the "Meter-Months" exceeds "Total Meter-months" ("Term of the Contract").

2.1.3. The Utility, at its own discretion, may extend the operation and maintenance period of the AMI system at terms mutually agreed upon with the AMISP.

3. **Obligations of the Selected Bidder in case an SPV has been formed**

3.1 In case an SPV has been formed, Selected Bidder shall ensure that it along with other members of the Consortium, if any, subscribe to 100% (one hundred percent) of the equity share capital of the SPV and continue to hold such shares for a period up to two years after Installation Milestone. In the event Selected Bidder is a consortium then the shareholding pattern indicated in the Consortium

Agreement, shall be maintained for a period up to two years after Installation Milestone.

3.2 In case a SPV has been formed, the Selected Bidder along with other members of the Consortium, if any, shall continue to hold not less than 51% (fifty-one percent) for the entire term of the AMISP Contract;

3.3 In the event the Selected Bidder is a Consortium, the Lead Consortium Member shall hold at least 51% (fifty-one per cent) of the equity of the AMISP at all times until the expiry of two years from the Installation Milestone as per this Contract and 26% (twenty-six) for the remaining term of this Contract.

3.4 Subject to the conditions of the contract, any direct and/ or indirect change in shareholding of SPV, if formed, shall require prior approval of the Utility. However, if the indirect change in shareholding of SPV is by virtue of the entity being a public listed company, same is permissible to the extent of its public shareholding.
In case of indirect change in shareholding of SPV, if the Utility doesn't provide a response within 60 days of submission of written request by AMISP, same may be considered as deemed approved, provided the Selected Bidder continues to maintain compliance with the Eligibility and Qualification requirements, i.e., where the Technically Evaluated Entity and/or the Financially Evaluated Entity is not the Bidding Company or a Member in a Bidding Consortium, as the case may be, the Bidding Company or Member shall continue to be an Affiliate of the Technically Evaluated Entity and/or Financially Evaluated Entity, for a period till two years after Installation Milestone.

Any change in shareholding of SPV shall be in compliance with applicable laws including but not limited to the guidelines issued vide Order No. F/No.6/18/2019-PPD by Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23 July 2020 and rules for foreign direct investment in India.

2. **Rights, Title and Interest to AMI System and Equipment**

2.1 The ownership, rights and title to the AMI system and other equipment installed by AMISP for operation of the AMI system pursuant to this Contract shall vest with AMISP during the entire Term of Contract.

However, the lenders shall have first right on AMISP's assets subject to the fulfilment of the provisions in this Contract.

2.2 Unless extended by mutual consent of the Utility and AMISP, after the Contract Period the ownership, rights and title of the installed AMI system and other equipment (if any) installed by AMISP for operation of the AMI system pursuant to this Contract shall be transferred to the Utility without any cost.

3. **Contract Price and Payment**

(a) Contract Price

5.1 CONTRACT PRICE

5.1.1 The Contract Price is as indica/ted in **SCC**

5.1.2 In the event any approval required for imports and/ or use of imported equipment is denied in accordance with all applicable laws including those in relation to testing issued by Ministry of Power (Order No No.9/16/2016-Trans-Part(2) dated 18 November 2020, as amended and/ or modified from time to time), the same shall neither entitle revision of Contract Price nor shall result in revision of the Project Implementation Plan.

5.1.3 For various accounting purposes of Discom like capitalization of assets etc., the AMISP Service charge shall be considered comprising two components namely Capex EMI (Capital Expenditure EMI) and Opex EMI (Operational Expenditure EMI) respectively in the ratio of 50:50. The applicability of the clause may be done during the Contract period and after the closure of the Contract as the case may be.

(b) Payment Mechanism

5.2 PAYMENT MECHANISM

5.2.1 The payment shall be made to the AMISP in Indian Rupees (INR) only.

5.2.2 The payment to the AMISP shall commence only one month after Operational Go-Live as defined in Section 6;

5.2.3 The payments due to the AMISP from the Utility shall be paid on monthly basis as per the payment structure specified in **SCC**.

5.2.4 Except in case of Change Order in accordance with Article 14 of this Contract, the sum total of all payments made to the AMISP shall not exceed the Contract Price quoted in Article 5.1.1

5.2.5 The actual payment shall be net of any applicable liquidated damages and/or penalty due to noncompliance of SLAs by the AMISP.

5.2.6 AMISP will raise and deliver the invoice and the Deliverables mentioned above to the Utility for the monthly payments within first 5 (five) working days of every month. AMISP shall also raise a supplementary invoice for the agreed amount towards software change requests/new requirements completed in the previous month, in accordance with Article 14.2 of this Contract. Utility will review the AMISP invoice raised by the AMISP and the Deliverables including the SLA performance report, in accordance with Article 8, within 5 (five) working days from the invoice and SLA performance report delivered by the AMISP. Utility may dispute the amount payable and shall pay the undisputed amount of the payment due via Escrow account (as specified in Article 5.2.7) from the 11th (Eleventh) working day of every month till the 10th (tenth) working day of succeeding month. The disputed amount, (related to actual number of meters installed, integrated and operationalized, penalty imposed due to non-compliance of SLAs, and liquidated damages), shall be dealt as per Article 13 of this Contract.

5.2.7 In order to ensure adequate funds for timely payment to the AMISP, the Utility shall ensure an Escrow account so created, which will at all times maintain 5 times of the monthly payment to the AMISP during the entire tenure of the Contract. All costs relating to opening, maintenance of the Escrow account shall be borne by the Utility. The standard procedures for operation of the Escrow account shall be followed as per the Regulatory guidelines.

5.2.8 The Utility will have a provision of opening of Escrow account, which will at all times maintain 5 times of monthly AMISP fees. The proposed payment mechanism will be as below:

i. Lumpsum upfront amount will be paid to AMISP on installation of Smart meters. The amount will be paid to Discom using GoI grant through TSA (Treasury Single Account) as per RDSS guidelines.

ii. Monthly fee will be paid to AMISP through Discom Escrow account. Fund will be arranged by Discoms through revenue/Govt support or any other sources.

5.2.9The Utility shall, as a condition precedent to the award of the contract to the selected bidder, establish an Escrow account to ensure recovery of the amount due to be paid to the AMISP including amount due to be paid towards supplementary invoice.

The Escrow account shall be at all times be kept valid for the entire duration of the Contract for a minimum amount of 5 times (based on bucket filling approach) of AMISP Monthly Fee, including the period, till the time AMISP's all claims are satisfied under this Contract.

The payment to AMISP shall be routed directly to the AMISP's bank account from the Escrow account till such time the undisputed amount of the payment due including amount due towards with supplementary invoice issued by AMISP is recovered in its entirety. Once the entire undisputed amount of the payment due including amount due towards supplementary invoice is recovered, the Escrow account shall no longer transfer any money to the AMISP. In the event the overall monthly amount due to the AMISP (i.e., 100% of undisputed amount due to be paid including any amount due to be paid towards supplementary invoice issued by AMISP) is not reached till 10th working day of the next month, the shortfall/ deficit amount shall be paid along with the undisputed amount due to be paid including any amount to be paid towards supplementary invoice issued by AMISP for the immediately succeeding month. In case Utility fails to clear any payment (including disputed amount) of the AMISP within 45 (forty-five) days of receipt of invoices, interest on the delayed payment shall be applicable as mentioned in Article 5.2.14 of the Contract.

5.2.10 In the event the AMISP fails to meet a particular performance criterion as mentioned under the Service Level Agreement (SLA) specified in Clause 7.7 of **Section 6** for cumulatively 3

(three) months in past 6 (six) months, resulting in the maximum penalty for the particular performance criterion, Utility may issue an SLA Default Notice to the AMISP directing it to take steps within 90 days to comply with the performance criterion specified in the SLA[1].

5.2.11 In the event a Smart Meter supplied and installed by the AMISP is damaged for reasons not attributable to the AMISP such as theft, vandalism, burning, etc. or as a result of Force Majeure Event, the AMISP shall not be liable for such damage. In such cases, upon receipt of Notice from the Utility, the AMISP shall repair or replace the damaged Smart Meters. AMISP shall be required to replace the Smart Meter no later than 15 days of notification by the Utility. Upon replacing the Smart Meter, AMISP shall be entitled to raise a supplementary invoice for the amount mutually agreed between AMISP and the Utility. The Supplementary Bill shall be paid along with the amount due to be paid towards AMISP Service Charges, for the immediately succeeding month. For the avoidance of doubt: (i) a damaged meter(s) shall be excluded from the total numbers installed and operational smart meters while conducting the SLA audit of the AMI system in accordance with Article 8; and (ii) in the event, AMISP replaces the Meter within 15 days of request by the Utility or Utility directs to continue operations without replacing the damaged Meter, the payment *qua* such meter(s) shall be done as if such damaged meter complies with the SLA prescribed in this AMISP Contract.

5.2.13. Utility shall reconcile and release the undisputed payment within 60 (Sixty) days of receipt of invoices along with requisite documents. The disputed amount shall be dealt as per Article 13 of this Contract. In case Utility fails to clear any payment (including disputed amount) of the AMISP within 60 (sixty) days of receipt of invoices, interest on the delayed payment shall be applicable as mentioned in Article 5.2.14 of the Contract.

5.2.14. In the event that the AMISP has duly followed the procedure enumerated above and the Utility fails to make any payment on its respective due date, the Utility shall pay interest to the AMISP on such delayed payment amount (including disputed amount) as from the due date of payment. The applicable interest rate on the delayed payment amount will be equal to

[1] For example, in the event AMISP fails to meet the norm specified for "**Availability of AMI System per month**" for cumulatively 3 (three) months in past 6 (six) months leading to levy of maximum penalty thereof.

the marginal cost of funds-based lending rate (MCLR)for one year of the State Bank of India plus 400 bps (*MCLR shall be as applicable on the 1st April of the financial year in which the date of release of delayed payment lies*). In case the period of default lies in two or more financial years the interest amount shall be calculated separately for the periods falling in different years.

5.2.15. All payments under this AMISP Contract shall be made to the Lead Consortium Member and Utility shall have no role in inter se payments to the Consortium Members.

5.2.16. AMISP service charge along with Lumpsum payment per meter paid by the Utility to the AMISP will be considered as an Operational Expenditure on Utility's account.

5.2.17 Additional Payment structure:

Additional Payment structure	
Activity	**Payment structure**
Meter damages or burn by the consumer	*In case consumer damages or burns the Smart Meter installed by the Agency -* *1. a. Employer will pay INR 2,200 plus taxes for Single Phase Meter with Box.* *b. Employer will pay INR 3,500 plus taxes for Three Phase Meter with Box.* *c. Employer will pay INR 7,300 plus taxes for Three Phase LT CT Meter with Box.* *d. Employer will pay INR 7,300 plus taxes for Three Phase HT consumers Meter.* *e. Further, the Employer will pay an additional amount of INR 1,000 plus taxes for NIC card, in case NIC card is also damaged.* –Payment shall be paid for each valid case on completion of following activities: o Removal of damage or burn meter. o installation & commissioning of material along with supporting documents. o *Meter with Box and NIC* shall be considered as burn/damage on account of consumer default only after receipt of necessary certificate from CEO of

	the respective town supported by relevant documentary evidence.
Meters required for New service connection after Go Live of the Town/Project	The modalities for installation of New Service Connection will be as follows: AMISP Service charge of each Meter shall start from the next month on completion of following activities – o Meter should be installed prior to 15th Day of that month. o Installation & Commissioning at Site. o Commissioning of Meters in HES & MDM o Availability of monthly (Billing + Load Survey) data through AMR method in MDM and providing the Data in mutually agreed format by integration to Billing system and/or MDM.

- ***Additional Payments for Meter damages or burn by the consumer***

  Documents Required for Meter damages or burn by the consumer

  - Contractor's detailed invoice.
  - Invoice certifying payments of SGST/CGST/IGST (as applicable) for the direct transaction between Employer and Contractor,
  - Copy of Certificate to the effect of payments of SGST/CGST/IGST (as applicable) and any other taxes etc. have been made against supply of materials through sub-contractors under the contract.
  - Evidence of meter damage or burn by the consumer.
  - Evidence of meter replacement, installation & commissioning of new meter.
  - Evidence of integration of replaced meters data/information in HES & MDM and/or Employer's billing system.

- Evidence of availability of monthly (Billing + Load Survey) data through AMR method in MDM and providing the Data in mutually agreed format by integration to Billing system and/or MDM solution.

- Submission of the certificate by the Employer's representative of the respective town supported by relevant documentary evidence for meter damage or burn by the consumer.

- **Additional Payments for Meters required for New service connection after Go Live of the Town/Project**

- Documents Required for New service connection after Go Live of the Town/Project

    - Contractor's detailed invoice.

    - Invoice certifying payments of SGST/CGST/IGST (as applicable) for the direct transaction between Employer and Contractor,

    - Copy of Certificate to the effect of payments of SGST/CGST/IGST (as applicable) and any other taxes etc. have been made against supply of materials through sub-contractors under the contract.

    - Evidence of integration of replaced meters data/information in HES & MDM and/or Employer's billing system.

    - Evidence of availability of monthly (Billing + Load Survey) data through AMR method in MDM and providing the Data in mutually agreed format by integration to billing system and/or MDM solution.

    - Submission of the certificate by the Employer's representative of the respective town supported by relevant documentary evidence that New Service Connection Meter installed by the Contractor and particular work has been completed.

    - Submission of the certificate by the Employer's representative for the EMI payments calculation,

as per SLA applicable (i.e. meter reading efficiency).

5.3 TAXES AND DUTIES

5.3.1 For Goods whether supplied from or outside India, the AMISP shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside India.

5.3.2 Any statutory increase or decrease in the taxes and duties including GST and Cess as applicable or in the event of introduction of new tax/cess or cessation of existing tax/cess subsequent to the AMISP's offer on the goods and services explicitly mentioned in financial bid shall be dealt with in accordance with provisions of Change in Law.

5.3.3Notwithstanding anything above or elsewhere in the Contract, in the event that the input tax credit of the GST charged by the AMISP is denied by the tax authorities to the Utility for reasons attributable to the AMISP, the Utility shall be entitled to recover such amount from the AMISP by way of adjustment from any of the subsequent invoices submitted by the AMISP to the Utility.

(c) Taxes and Duties

4. **Performance Security**

4.1 **The initial performance security submitted by the Selected Bidder at the time of contract signing shall be valid for a period of at least 6 months beyond the end of the installation milestone.**

- **Subsequently, before 3 months of expiry of the performance security, Selected bidder shall ensure renewal of the same on a rolling basis, for thata validity period of at least 3 years (or) for a period of 6 months beyond the end of the contract period, whichever is lesser.**

- **It may be noted that at any point of time till 6 months beyond the end of the contract period, a valid performance security for the amount as defined in the terms and conditions of the tender shall be in place. It shall be the responsibility of the Selected Bidder to ensure the same and failure to adhere to the above mentioned conditions shall lead to invocation of Performance Security already submitted by**

bidder and the event shall be considered as an event of default by AMISP" for necessary action as per provision of SBD.

- However, in case of delay in Installation Milestone, the validity of the initial Performance Security shall be extended by the period of such delay. In the event delay is solely due to acts and/ or omission of the Utility cost of extending the validity of Performance Security shall be reimbursed to the AMISP by the Utility.

4.2 Upon achievement of Installation Milestone, the value of the Performance Security shall be reduced by AMISP, to the extent indicated in **SCC** as determined in accordance with numbers of meters considered for Installation Milestone.

4.3 Any payments shall be made to the AMISP only after receipt of the initial Performance Security by Utility.

4.4 Upon Termination of the Contract due to Utility Event of default or expiry of the Contract Period, the separate Performance Security shall be discharged by Utility without any interest and returned to the AMISP not later than 14 (fourteen) working days following the date of Termination of the Contract.

Upon Termination of the Contract due to AMISP Event of default, the Performance Security shall be forfeited by Utility.

In case of any delay by the AMISP in performing the activities of the scope of work with respect to the Project Implementation Schedule, then upon Utility's request, the AMISP shall extend the validity of the separate Performance Security for the period for which the Contract is extended. In the event delay is solely due to acts and/ or omission of the Utility cost of extending the validity of separate Performance Security shall be reimbursed to the AMISP by the Utility.

5. **Liquidated Damages, Penalty and Incentive**

5.1 Except in case of Force Majeure or where the delay in delivery of the Solution is caused due to any delay or default of Utility, if the Installation Milestone is delayed by more than 27 (twenty-seven) months from the date of execution of the Contract the AMISP shall be liable to pay liquidated damages as per the rates specified in this Article.

5.2 Except in case of Force Majeure or where the delay in delivery of the Solution is caused due to any delay or default of Utility, if the delivery, site installation, integration and operationalization of:

~~5.2.1 100% of HT Meters each with related hardware, software and equipment is delayed by more than 27 (twenty seven) months from the date of execution of the Contract the AMISP shall be liable to pay liquidated damages as per the rates specified in this Article.~~

~~5.2.2 100% of DT Meters each with related hardware, software and equipment is delayed by more than 18 (eighteen) months from the date of execution of the Contract the AMISP shall be liable to pay liquidated damages as per the rates specified in this Article.~~

5.3 Utility shall without prejudice to all its other remedies under the Contract, deduct from the amount due to be paid, as liquidated damages, 50% of AMISP Service Charge for each delayed meter for each completed month of delay for a maximum period of 12 (twelve) months. An illustrative example for arriving at the deductions is given in **SCC**.

5.4 If the AMISP achieves milestone of "Installation Milestone (as provided in Section 6) at least one month in advance than the timelines specified in the Contract, Utility shall provide an incentive as specified in **SCC**.

5.5 Upon achieving Installation Milestone, in accordance with Article 7.4, AMISP shall be entitled to raise a supplementary invoice for the amount indicated therein. The Supplementary invoice shall be paid along with the amount due to be paid for AMISP Service Charges for the immediately succeeding month.

6. **SLAs and SLA Audit**

8.1 The AMISP shall be liable to penalties in the event of non-compliance of Service Level Agreements as specified in Section 6;

8.2 A designated team/person from Utility may review the system generated SLA performance report of AMISP each month. The review/audit report will form basis of any action relating to imposing penalty on or breach of Contract of the AMISP.

8.3 In case, there is no review/ audit report submitted within 10 (ten) working days of every month, it shall be deemed that all SLAs were met in the previous month.

7. **Force Majeure**

(a) Force Majeure Event

9.1 A Force Majeure means any event or circumstance or combination of events and circumstances including those stated below that wholly or partly prevents or unavoidably delays an Affected Party in the performance of its obligations under this AMISP Contract, but only if and to the extent that such events or circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided if the Affected Party had taken reasonable care or complied with prudent utility practices:

a) Natural Force Majeure Events:

act of God, including, but not limited to drought, fire and explosion (to the extent originating from a source external to the site), earthquake, epidemic, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, or exceptionally adverse weather conditions,

b) Non-Natural Force Majeure Events:

i) Direct Non–Natural Force Majeure Events

a) Nationalization or compulsory acquisition by any Governmental instrumentality of any material assets or rights of the AMISP; or

b) the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consents, Clearances and Permits required by the AMISP to perform their obligations under the Contract or any unlawful, unreasonable or discriminatory refusal to grant any other Consents, Clearances and permits required for the development/ operation of the Project, provided that a Competent Court of Law

declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down; or

c) any other unlawful, unreasonable or discriminatory action on the part of any Governmental instrumentality which is directed against the Project, provided that a competent Court of law declares the action to be unlawful, unreasonable and discriminatory and strikes the same down.

d) any partial or complete shut-down of the internet services in the Project area

e) Shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure

f) Restrictions imposed by central or state government that prevent or delay project execution

ii) Indirect Non - Natural Force Majeure Events:

a) an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;

b) radioactive contamination or ionizing radiation originating from a source in India or resulting from any other Indirect Non-Natural Force Majeure Event mentioned above, excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the Site by the Affected Party or those employed or engaged by the Affected Party; or

c) industry wide strikes and labor disturbances, having a nationwide impact in India.

9.2 FORCE MAJEURE EXCLUSIONS

9.2.1 Force Majeure shall not include (i) any event or circumstance which is within the reasonable control of the Parties and (ii) the following conditions, except to the extent that they are consequences of an event of Force Majeure:

(b) Force Majeure Exclusions

i. Unavailability, late delivery, or changes in cost of the machinery, equipment, materials, spare parts etc. for the Project;
ii. Delay in the performance of any Contractors or their agents;
iii. Non-performance resulting from normal wear and tear typically experienced in transmission materials and equipment;
iv. Strikes or labour disturbance at the facilities of the Affected Party;
v. Insufficiency of finances or funds or the AMISP Contract becoming onerous to perform; and
vi. Non-performance caused by, or connected with, the Affected Party's:
    a. negligent or intentional acts, errors or omissions;
    b. failure to comply with an Indian Law; or
    c. breach of, or default under this AMISP Contract or any Project documents.

9.3 NOTIFICATION OF FORCE MAJEURE EVENT

(c) Notification of Force Majeure Event

9.3.1 The Affected Party shall give notice to the other Party of any event of Force Majeure as soon as reasonably practicable, but not later than 7 (seven) days after the date on which such Party knew or should reasonably have known of the commencement of the event of Force Majeure. If an event of Force Majeure results in a breakdown of communications rendering it unreasonable to give notice within the applicable time limit specified herein, then the Party claiming Force Majeure shall give such notice as soon as reasonably practicable after reinstatement of communications, but not later than 1(one) day after such reinstatement. Provided that such notice shall be a pre-condition to the Affected Party's entitlement to claim relief under this AMISP Contract. Such notice shall include full particulars of the event of Force Majeure, its effects on the Party claiming relief and the remedial measures proposed. The Affected Party shall give the other Party regular reports on the progress of those remedial measures and such other information as the other Party may reasonably request about the Force Majeure.

9.3.2 The Affected Party shall give notice to the other Party of (i) the cessation of the relevant event of Force Majeure; and (ii) the cessation of the effects of such event of Force Majeure on the performance of its rights or obligations under this

AMISP Contract, as soon as practicable after becoming aware of each of these cessations.

9.4 DUTY TO PERFORM AND DUTY TO MITIGATE

9.4.1 To the extent not prevented by a Force Majeure Event, the Affected Party shall continue to perform its obligations as provided in this AMISP Contract. The Affected Party shall use its reasonable efforts to mitigate the effect of any event of Force Majeure as soon as practicable.

9.5 AVAILABLE RELIEF FOR A FORCE MAJEURE EVENT

(d) Duty to Perform and Duty to Mitigate

9.5.1 Subject to this Article 9

a) no Party shall be in breach of its obligations pursuant to this AMISP Contract except to the extent that the performance of its obligations was prevented, hindered or delayed due to a Force Majeure Event;

b) every Party shall be entitled to claim relief for a Force Majeure Event affecting its performance in relation to its obligations under this AMISP Contract;

(e) Available Relief for a Force Majeure Event

c) in the event on the 10th anniversary of the date of execution of this AMISP Contract, the AMISP has not operated the AMI system for 'Total Meter-Months' due to a Force Majeure Event(s) the Utility shall extend the term of this AMISP Contract by such duration as may enable the operation of AMI system for the 'Total Meter-Months';

d) The AMISP shall be entitled to receive payment at rates to be mutually agreed between the Utility and the AMISP for the smart meters replaced or repaired due to an event of force majeure.

8. **Intellectual Property**

10.1 All Intellectual Property Rights in all material (including but not limited to all Source code, Object code, records, reports, designs, application configurations, data and written material, products, specifications, reports, drawings and other documents), which have been newly created and developed by the AMISP solely during the performance of Related Services and for the purposes of inter-alia use or sub-license of such services under this Contract, shall be the property of the AMISP. The AMISP undertakes to disclose all such material, which have been newly created and developed by the AMISP solely during the performance of Related Services and for the purposes of inter-alia use or sub-license of such services under this Contract, to the

Utility. The AMISP hereby grants to Utility a perpetual, non-exclusive, non-transferable, irrevocable, royalty-free license to use all material disclosed to the Utility under the Contract. Nothing contained herein shall be construed as transferring ownership of any Intellectual Property Right from the AMISP to the Utility.

10.2 The AMISP shall ensure that while it uses any software, hardware, processes, document or material in the course of performing the Services, it does not infringe the Intellectual Property Rights of any person and the AMISP shall keep the Utility indemnified against all costs, expenses and liabilities howsoever, arising out any illegal or unauthorized use (piracy) or in connection with any claim or proceedings relating to any breach or violation of any permission/license terms or infringement of any Intellectual Property Rights by the AMISP or its personnel during the course of performance of the Related Services. In case of any infringement by the AMISP, the AMISP shall have sole control of the defence and all related settlement negotiations

10.3 Subject to Article 10, the AMISP shall retain exclusive ownership of all methods, concepts, algorithms, trade secrets, software documentation, other intellectual property or other information belonging to the AMISP that existed before the date of execution of the Contract.

11. **Termination**

(a) AMISP Event of Default

11.1 AMISP Event of Default means any of the following events arising out of any acts or omission of AMISP, 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 AMISP has failed to remedy these events within a period of 90 (ninety) days of issuance of a notice by Utility requiring AMISP to remedy such event.

a) AMISP has failed to procure and arrange requisite finances for the implementation of the Project;
b) AMISP 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) AMISP, in the judgment of Utility has engaged in corrupt, fraudulent, collusive, or coercive practices, in competing for or in executing the Contract; or

d) AMISP is adjudged bankrupt or insolvent, or if a trustee or receiver is appointed for AMISP or for the whole or material part of its assets that has a material bearing on its ability to implement the Project;

e) AMISP 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 Utility would adversely affect AMISP's ability to implement the Project;

f) A resolution for winding up of AMISP is passed, or any petition for winding up of AMISP 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 AMISP is ordered to be wound up by a court of competent jurisdiction;

g) In the event AMISP fails to cure the default as indicated in the SLA Default Notice within the time period specified therein;

h) Failure of AMISP to furnish Performance Security in accordance with the provisions of this Contract;

i) Failure or inordinate delay by AMISP to provide Solution as per Contract;

j) Any representation or warranty made by the AMISP during the term of the Contract is found to be false and/or misleading;

k) Failure on account of AMISP to abide by Applicable Laws and regulations;

l) The shareholding of the AMISP ceases to be in accordance with the provisions of this Contract;

m) In the event equipment installed or proposed to be installed by the AMISP is found to have any embedded malware/ trojans/ cyber threat;

n) AMISP fails to comply with the local content requirement as specified in the Bid Submission;

o) AMISP fails to comply with any of its material obligations under this Contract.

p) In the event the Solution supplied do not meet the minimum specifications as per the Contract, and the same is not replaced/ modified by the AMISP to meet the requirements within 14 (fourteen) working days of being informed by Utility, or as mutually decided between Utility and AMISP.

11.2 Utility Event of Default means any of the following events, unless such event has occurred as a consequence of the AMISP Event of Default or a Force Majeure event and where Utility has failed to remedy these events within a period of 90

(b) Utility Event of Default

(ninety) days of issuance of a notice by AMISP requiring Utility to remedy such event:

a) Failure of Utility to establish an Escrow account to pay the Monthly amount due to be paid including amount due towards supplementary invoice in accordance with Article 5.2 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 AMISP 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 AMISP's obligations under this Contract.

11.3 TERMINATION FOR AMISP EVENT FOR DEFAULT

11.3.1 Without prejudice to any other right or remedy which Utility may have in respect thereof under this Contract, upon the occurrence of AMISP Event of Default, Utility shall be entitled to terminate this Contract in the manner provided in Article 11.3.2.

(c) Termination for AMISP Event for Default

11.3.2 Utility shall issue a Preliminary Notice to AMISP providing 90 (Ninety)Days, or such extended period as the Utility may allow, to cure the underlying Event of Default. If AMISP 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 AMISP.

11.4 TERMINATION FOR UTILITY EVENT FOR DEFAULT

11.4.1 Without prejudice to any other right or remedy which AMISP may have in respect thereof under this Contract, upon the

occurrence of a Utility Event of Default, AMISP shall be entitled to terminate this Contract in the manner provided in Article 11.4.2.

(d) Termination for Utility Event of Default

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

11.5 CONSEQUENCES OF TERMINATION

Upon Termination of the Contract, the AMISP shall:

(e) Consequences of Termination

11.5.1 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.

11.5.2 Following issue of the Termination Notice by Utility or AMISP, Utility take possession and control of AMISP's control room and call centre and the exclusivity granted to AMISP under Article 4 will come to an end.

11.5.3 Upon termination of this Contract by Utility or AMISP on account of AMISP's Event of Default (in accordance with Article 11.1), or termination of this Contract on account of Utility's event of default (in accordance with Article 11.2), AMISP shall be entitled to a termination payment subject to proper transfer of the installed AMI System, as agreed mutually upon, basis the following criteria:

a) In case termination of this Contract is on account of AMISP's event of default: Termination payment to AMISP after Installation Milestone has been declared shall be the percentage, specified in **SCC**, of the termination payment Value as determined in terms of this Contract.

b) In case termination of this Contract is on account of Utility's event of default: Termination payment to AMISP after Installation Milestone has been declared shall be the percentage, specified in **SCC**, of the termination payment Value as determined in terms of this Contract.

c) In case termination of this Contract is prior to Installation Milestone the Termination payment shall be equal to:
   i. the percentage, specified in **SCC,** of the value of the assets proposed to be handed over to the Utility as certified by an independent valuer in the event termination is on account of AMISP event of default–and
   ii. the percentage, specified in **SCC,** of the asset values shall be paid to the AMISP in the event termination is on account of Utility event of default

   For the avoidance of doubt, it is clarified that in the event lumpsum payment in terms of Article 5 has been made then such payment shall be reduced from the amount determined in accordance with this Article 11.5.3.(c)

d) In case termination of the Contract is prior to the Installation Milestone- The Goods that are complete and ready for shipment within 28 (twenty-eight) days after the AMISP's receipt of the Notice of termination shall be taken into account while determining value of the assets proposed to be handed over to the Utility.

e) In the event of termination prior to Installation Milestone, Utility may request the AMISP 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.

Upon termination of this Contract by Utility or AMISP on account of AMISP's Event of Default (in accordance with Article 11.1), or termination of this Contract on account of Utility's event of default (in accordance with Article 11.2), AMISP 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 30 (thirty) days from the date of such invoice.

11.5.4 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/ remaining meter-months of operating the AMI system with percentage of total meters installed, integrated and operationalized as on the date of termination, and AMISP Service Charge, and

discounting the same as on date of termination at the percentage specified in **SCC** ("**Present Value**").

b) All amounts due, but not paid by the Utility, including the aggregated amount due to be paid including amount due to be paid towards supplementary invoice, but not paid or recovered from the Utility, for the AMI system operations and maintenance as defined in the RFP by the AMISP, shall be calculated and factored in to arrive at the net outstanding receivables of the AMISP ("**Outstanding Receivables**");

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

d) Termination Payment Value shall be equal to the sum of Net Present Value and Outstanding Receivables as per Article 11.5.4.(a) and (b); reduced by Outstanding Payables as per Article 11.5.4.(c) and the sum of insurance proceeds received by the AMISP for the AMI system, (if any).

11.5.5 Upon Termination of the Contract or expiry of the contract period, the AMISP 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 Article 11.6.

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

11.5.7 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 Utility.

11.5.8 The AMISP and the Authorized personnel from Utility will sign a completion certificate at the end of successful completion (all points tracked to closure) of the Exit Management Plan.

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11.6 Exit Management

11.6.1 Exit Management

(f) Exit Management

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, AMISP shall provide necessary handholding and transition support to the Utility or its agency for maintaining the system post the Contract with the AMISP. This includes (but not limited to):

a) Conducting detailed walkthrough and demonstrations for the AMI Solution;

b) Handing over of AMI Solution, Utility's data and all other relevant documentation including updated detailed bill of quantities for materials and services provided under the Contract;

c) Addressing the queries/clarifications of the designated staff / new agency with respect to the working / performance levels of the infrastructure;

d) Conducting training sessions;

e) Knowledge Transfer;

f) Any other activity, over and above these, as may be deemed necessary to meet the service levels and requirements specified in the RFP.

11.6.2 Transfer of Assets / AMI Solutions

a) Utility shall be entitled to serve notice in writing on the AMISP at any time during the Exit Management Period requiring the AMISP and/or its sub-contractor to provide the Utility with a complete and up to date list of

the Assets within 30 (thirty) days of such notice. Utility shall also be entitled to serve notice in writing on the AMISP at any time prior to the end of the Exit Management Period requiring the AMISP to transfer to the Utility or its nominated agencies in accordance with Article 11.

b) In case of contract being terminated by Utility, Utility reserves the right to ask AMISP to continue running the project operations for a period of 3 (three) months after termination orders are issued. In case of contract being terminated by AMISP, Utility reserves the right to ask the AMISP to continue running the project operations for a period of 6 (six) months after termination notice is served by AMISP. In such case, payments during the Exit Management Period shall be made in accordance with the Article 5.2 and 11.5 (as the case may be).

c) Upon service of a notice under this Plan, the following provisions shall apply:

   i. All title to the assets as per the updated detailed bill of quantities for materials and services provided under the Contractshall be transferred to Utility, on or before the last day of the Exit Management Period.

   ii. Payment to the outgoing AMISP shall be made to the tune of last set of completed Services / deliverables, subject to SLA requirements.

11.6.3 Cooperation and provision of information

During the Exit Management Period:

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

b) Promptly on reasonable request by the Utility, the AMISP shall provide access to and copies of all information held or controlled by them which they have prepared or maintained in accordance with this Contract relating to any material aspect of the services (whether provided by the AMISP or sub-contractors appointed by the AMISP) to the Utility or its nominated agency. Such information shall include details pertaining to the list of assets as per updated detailed bill of quantities for materials and services provided under the Contract, services rendered and other performance data. AMISP shall permit the Utility or its nominated agencies to have

reasonable access to its employees and facilities to understand the methods of delivery of the services employed by the AMISP and to assist appropriate knowledge transfer; and

c) In the event of Termination prior to Installation Milestone, AMISP and Utility shall jointly appoint an Independent Valuer to certify the value of assets, as per the updated detailed bill of quantities for materials and services provided under the Contract, proposed to be handed over to the Utility upon termination. The cost of Independent Valuer shall be paid by the AMISP.

11.6.4 Confidential information, security and data

AMISP shall promptly on the commencement of the Exit Management Period supply to the Utility or its nominated agency the following:

a. information relating to the list of assets as per the updated detailed bill of quantities for materials and services provided under the Contract, current Services rendered and consumer and performance data relating to the performance of sub-contractors in relation to the Services;
b. documentation relating to the Project's Intellectual Property Rights;
c. documentation relating to sub-contractors;
d. all current and updated data as is reasonably required for purposes of Utility or its nominated agencies transitioning the services in a readily available format;
e. all other information (including but not limited to documents, records and agreements) relating to the services reasonably necessary to enable Utility or its nominated agencies, to carry out due diligence in order to transition the provision of the Services to Utility or its nominated agencies, (as the case may be).

11.6.5 Transfer of certain agreements

On request by the Utility or its nominated agency, the AMISP shall affect such assignments, licenses and sub-licenses as Utility may require in favor of the Utility or its nominated agency reasonably necessary for the carrying out of replacement services. These agreements may include equipment lease, maintenance or service provision agreement between selected AMISP and third-party lessors, service providers, and any other agreements related to the Services.

11.6.6 General obligations of the AMISP during exit management period

a. The AMISP shall provide all such information as may reasonably be necessary to effect as seamless a handover as practicable in the circumstances to the Utility or its nominated agency and which the AMISP has in its possession or control at any time during the Exit Management Period.
b. For the purposes of this Schedule, anything in the possession or control of the AMISP or associated entity, or sub-contractors is deemed to be in the possession or control of the AMISP.
c. The AMISP shall commit adequate resources to comply with its obligations under this Exit Management Schedule.

11.6.7 Exit management process

The AMISP 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. AMISP shall get this process approved by Utility. The Plan shall include, but not be limited to, the following-

a. 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;
b. Plans for the communication with such of the AMISP's subcontractors, staff, suppliers, customers and any related third party as are necessary to avoid any material detrimental impact on the Utility's project operations and AMI Services to other stakeholders as a result of undertaking the transfer;
c. Plans for provision of contingent support to Utility or its nominated Agency for a reasonable period after transfer.
d. The Exit Management Plan including all updates shall be presented by the AMISP to and approved by the Utility or its nominated agencies.
e. During the Exit Management Period, the AMISP shall use its best efforts to deliver the services.
f. Payments during the Exit Management Period shall be made in accordance with the Articles 5.2 and 11.5 (as the case may be)

g. The Exit Management plan shall be furnished in writing to the Utility or its nominated agencies within 90(ninety) days from date of execution this AMISP contract

h. The AMISP shall re-draft the Exit Management Plan annually thereafter to ensure that it is kept relevant and up to date. The updated plan shall be furnished in writing to the Utility or its nominated agencies within 15 days from the end of such period.

12. **Liability/ Indemnity**

12.1 The AMISP hereby agrees to indemnify Utility, for all conditions and situations mentioned in this Article, in a form and manner acceptable to Utility. The AMISP agrees to indemnify Utility and its officers, servants, agents ("Utility Indemnified Persons") from and against any costs, loss, damages, expense, claims including those from third parties or liabilities of any kind howsoever suffered, arising or incurred inter alia during and after the Contract Period out of:

a) any negligence or wrongful act or omission by the AMISP or its agents or employees or any third Party associated with AMISP in connection with or incidental to this Contract; or

b) any infringement of patent, trademark/copyright or industrial design rights arising from the use of the supplied Solution or any part thereof.

12.2 The AMISP shall also indemnify Utility against any privilege, claim or assertion made by third party with respect to right or interest in, ownership, mortgage or disposal of any asset, property, movable or immovable as mentioned in any Intellectual Property Rights, licenses and permits.

12.3 Without limiting the generality of the provisions of the Article 12.1 and 12.2, the AMISP shall fully indemnify, hold harmless and defend Utility Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which Utility Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to the Solution, information, design or process supplied or used by the AMISP in performing the AMISP's obligations or in any way incorporated in or related to the Project. If in any such

suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the AMISP shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Solution or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the AMISP shall promptly make every reasonable effort to secure for the Utility a license, at no cost to Utility, authorizing continued use of the infringing work. If the AMISP is unable to secure such license within a reasonable time, the AMISP shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof.

12.4 SURVIVAL ON TERMINATION

(a)Survival on Termination

12.4.1 The provisions of this Article 12 shall survive the Termination of the Contract

12.5 DEFENCE OF CLAIMS

(b) Defence of Claim

12.5.1 If any proceedings are brought or any claim is made against the Utility arising out of the matters referred to in Article 12, the Utility shall promptly give the AMISP a notice thereof, and the AMISP may at its own expense and in the Utility's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claims.

12.5.2 If the AMISP fails to notify the Utility within 28 (twenty-eight) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Utility shall be free to conduct the same on its own behalf.

12.5.3 The Utility shall, at the AMISP's request, afford all available assistance to the AMISP in conducting such proceedings or claim, and shall be reimbursed by the AMISP for all reasonable expenses incurred in so doing.

12.6 LIMITATION OF LIABILITY

(c) Limitation of Liability

12.6.1 Except in cases of gross negligence or wilful misconduct:

a) 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 AMISP to pay liquidated damages to the Utility; and

b) The aggregate liability of the AMISP to the Utility, whether under the Contract, in tort, or otherwise, shall not exceed the Contract Price. Provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the AMISP to indemnify the Utility with respect to infringement of any Intellectual Property Rights.

13. Governing Laws and Settlement of Disputes

13.1 The Utility and the AMISP shall make every effort to resolve amicably any disagreement or dispute arising between them under or in connection with the Contract, by direct informal negotiation.

13.2 If the Utility and the AMISP fail to resolve such a dispute (the date of commencement of the dispute shall be taken from the date when this Article reference is quoted by either Party in a formal communication clearly mentioning existence of dispute or as mutually agreed) or difference by mutual consultation within 28 (twenty-eight) days from the commencement of such consultation, either Party may require that the dispute be referred for resolution to the formal mechanisms specified in this Article13.

13.3 Specifically, for the resolution of disputed payments, All disputes or differences in respect of which the decision, if any, has not become final or binding as aforesaid in Article 13.2 shall be referred to a dedicated Conciliation committee for RDSS, formulated by Ministry of Power (MoP) for resolution of any disputes under the scheme. This Conciliation Committee shall be an alternate dispute resolution mechanism being put in the place by the MoP. The process shall be in-line with the notification, as and when published by the MoP. If the successful bidder is not willing to take recourse to this process or has any reluctance in this behalf, there shall be no compulsion to take such a recourse. This Conciliation process shall be conducted under Part III of the Arbitration and Conciliation Act, 1996. In the event of the conciliation proceedings being successful, the parties to the dispute would sign the written settlement agreement and the conciliators would authenticate the same. Such settlement agreement would then be binding on the parties in terms of Section 73 of the Arbitration and Conciliation Act, 1996. After successful conclusion of proceedings, the Parties to the conciliation process, have to undertake and complete all necessary actions for implementation of the terms of settlement within a period

of 30 days from execution of settlement agreement, unless a different timeline not exceeding 60 days is agreed upon in settlement agreement. All pending claims of parties, in connection with the dispute, before any other legal forum are to be withdrawn within the said 30 days in pursuance of the settlement agreement. In case of failure of the conciliation process at the level of the Conciliation Committee, the parties may withdraw from conciliation process and take recourse to the laid down legal process of Courts. However, the option of Arbitration would not be available once the conciliation mechanism has been exercised.13.4 All disputes or differences in respect of which the decision, if any, has not become final or binding as aforesaid in Article 13.2 or if the parties are not willing to refer the dispute to the dedicated Conciliation committee for RDSS, then the dispute shall be settled by arbitration in the manner hereinafter provided. The arbitration shall be conducted by three arbitrators, one arbitrator each to be nominated by the AMISP and the Utility and the third to be appointed as the presiding arbitrator by both the arbitrators in accordance with the Arbitration and Conciliation Act,1996. If either of the parties fails to appoint its nominee arbitrator within 60 (sixty) days after receipt of a notice from the other party invoking the arbitration, the nominee arbitrator appointed by one of the party invoking the arbitration clause shall act as the sole arbitrator to conduct the arbitration under the Arbitration and Conciliation Act 1996, as amended from time to time.

13.5 The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 or any statutory modification thereof. The seat of arbitration shall be as specified in **SCC**.

13.6 The Contract shall be governed by and interpreted in accordance with laws of India. The Courts, specified in **SCC**, shall have exclusive jurisdiction in all matters arising under this Contract.

13.7 Parties to Perform Obligations: Notwithstanding the existence of any Dispute and difference referred to the Arbitration Tribunal as provided in Article 13.4 and save as the Arbitration Tribunal may otherwise direct by a final or interim order, the Parties hereto shall continue to perform their respective obligations (which are not in dispute) under this Contract.

14. Change Order

(a) Change Notes / Change Order to Alter Number of Meters to be Installed

14.1 Change Notes / Change Order to Alter Number of Meters to be Installed

Necessity of Change Notes arise due to change in the number of meters against the numbers agreed for the project. Negative variation is permissible only up to the "Installation Milestone". Positive variation is however possible at any time during the Contract Period. The variation allowed cannot be more than the minimum and maximum numbers, as specified in **SCC.**

14.1.1 Change Notes shall be generated and maintained by the AMISP based on a written communication from the authorised officer(s) of the Utility. The AMISP shall receive the AMISP Service Charges for additional meters installed and made operational through the means of Change Notes.

14.1.2 To establish the revised Total Meter-Months for the project due to additional meters installed, the Utility shall convert all such Change Notes to Change Orders any time before the Total Meter-Months are completed.

14.1.3 In the event a Smart Meter is shifted from one node to another, AMISP shall be entitled to receive the Monthly AMISP Service Charges for such meters as if such smart meter has not been shifted. In other words, this will not increase the total number of meters installed by the AMISP.

14.1.4 In the event a Change Note / Change Order causes an increase or decrease in the time required for, the AMISP's performance of any provisions under the Contract, an equitable adjustment shall be made in the Project Implementation Schedule as provided in Clause 12 of Section 6 and the Contract shall accordingly be amended. Any claims by the AMISP or the Utility for adjustment under this Article must be asserted within 28 (twenty-eight) days from the date of the AMISP's receipt of the Change Note / Change Order. The Parties agree that any change in the delivery and Project Implementation Schedule shall result in a proportional change in the Term of the Contract.

14.1.5 An institutional mechanism will be set up for taking decisions regarding requests for changes or New Requirements. The Utility will set up a Change Control Committee with members from the Utility and the AMISP. If it is unable to reach an agreement, the decision of the Utility will be final.

14.1.6 In the case of additional meters installed through Change Notes maintained by the AMISP, the Utility shall convert all such Change Notes to Change Orders any time before the Total Meter-Months are completed.

14.2 ~~Change Request/Change Order for New/Enhancements to Software Applications~~

(b) **Change Request/ Change Order for New/Enhancements to Software Applications: This section stands deleted**

~~Another form of change may arise when the Utility discovers the need to have enhancements in the delivered software applications and/or entirely new functional requirements in the applications ("New Requirements"), subject to Article 14.2.5 of this Contract. It is to be noted that there will be no payment to AMISP for any change request related to AMI system.~~

~~14.2.1 At any point in time the Utility may raise a Change Request to include New Requirements in the AMI system application. This Change Request shall include the following:~~

- ~~Identification and documentation of the need for the change~~
- ~~Functional details of the change~~
- ~~Information related to initiator, initiation date and~~
- ~~Priority of the change~~

~~14.2.2 The AMISP will analyse and evaluate the Change Request to come up with the estimate of the effort involved in terms of man-days required (in respective skill areas) and time schedule as per agreed priority and document the same. Utility will use the estimated effort of the new requirements made by the AMISP and together with the quoted man-month rates arrive at a cost estimate. For all technical resources, the quoted man-month rate shall be used. Efforts of support staff shall not be taken into consideration for this purpose.~~

~~14.2.3 Based on the agreed cost estimate, the Utility shall raise a "Change Order". The AMISP shall undertake the development of the New Requirements only after securing express consent of the Utility. If the consent of Utility is not received, then the change will not be carried out. The change will be implemented in accordance to the agreed cost, effort, and schedule by the AMISP and the change will be verified by the Utility on completion of implementation.~~

14.2.4 If the Change Order for New Requirements agreed to herein causes an increase or decrease in cost of, or the time required for, firm's performance of any provisions under the Agreement, equitable adjustments shall be made in the Agreement Price or Delivery Schedule, or both, and the Agreement shall accordingly be amended. Any claims by firm for adjustment under this must be asserted within 30 (thirty) days from the date of AMISP receiving the change order.

14.2.5 The following categories of Change Requests shall not be treated as "New Requirements" and the AMISP is expected to deliver these Change Requests as per agreed schedule without any commercial implications.

- All bug fixes
- All upgrades of the licensed platforms
- Changes made to report templates
- New reports not exceeding [x] numbers
- Integration with national level systems like NFMS etc.
- Minor changes not requiring more than 10 man-days
- Aspects already covered under existing scope of work provided in this Contract

14.2.6 In the case of New Requirements in Software Applications, Utility may at any time, by a written Change Request seek changes to be implemented within the general scope of the Agreement provided this does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Solution and the technical compatibility of the change envisaged with the nature of the Solution as specified in the Contract.

14.2.7 The Change Request/New Requirement management procedure will follow the following steps: -

i. Identification and documentation of the need for the Change Request/New Requirement - The information related to initiator, initiation date and details of Change Request/New Requirement and priority of the change/New Requirement will be documented by the Utility.

ii. Analysis and evaluation of the Change Request/New Requirement - Impact of the change/ new requirement in terms of the estimated effort, changed schedule, cost and the items impacted will be analyzed and documented by the AMISP.

~~iii. Approval or disapproval of the Change Request/New Requirement – the Utility will approve or disapprove the Change Request/New Requirements. Once approved the Change Request is converted into a Change Order which is subject to the conditions laid down in Article 14.2.5.~~

~~iv. Implementation of the change/New Requirement – The Change Order/New Requirement will be implemented in accordance with the agreed cost, effort, and schedule by the AMISP.~~

~~v. Verification of the change/New Requirement - The Change Order/New Requirement will be verified by the Utility on implementation of the change request.~~

15. Miscellaneous

(a) Waiver

15.1 WAIVER

15.1.1 Subject to Article 15.1.2, no relaxation, forbearance, delay, or indulgence by either Party in enforcing any of the terms and conditions of the Contract or the granting of time by either Party to the other shall prejudice, affect, or restrict the rights of that Party under the Contract. Neither shall any waiver by either Party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

15.1.2 The waiver by either Party of a breach or default of any of the provisions of this Contract by the other Party shall not be interpreted as:

a) A waiver of any succeeding breach of the same or other provision, nor shall any delay or omission on the part of the other Party to exercise; or
b) A way to avail itself of any right, power, or privilege that it has or may have under this contract to operate as waiver of any breach or default by the other Party.
c) Any waiver of a Party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the Party granting such waiver, and must specify the right and the extent to which it is being waived.

(b) Extension of Time

15.2 EXTENSIONS OF TIME

15.2.1 If at any time during performance of the Contract, the AMISP or its subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to this Contract, the AMISP shall promptly notify the Utility in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the AMISP's notice, the Utility shall evaluate the situation and may at its discretion extend the AMISP's time for performance, in which case the extension shall be ratified by the Parties by amendment of the Contract.

15.2.2 Except in case of Force Majeure, as provided in Article 9 or where the delay in delivery of the Goods or completion of Related Services is caused due to any delay or default of the Utility, any extension granted under Article 15.2.1 shall not absolve the AMISP from its liability to the pay of liquidated damages pursuant to Article 7. Time will be the essence of the Contract and no variation shall be permitted in the delivery time/delivery schedule mentioned in the order unless agreed by the Utility. The AMISP is expected to implement the systems for the project area as per the schedule indicated in the Contract.

(c) Insurance

15.3 **INSURANCE**

15.3.1 The Goods supplied under the Contract shall be fully insured by the AMISP against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery.

15.3.2 The AMISP shall furnish to the Utility copies of certificates and policies of the Insurances as soon as they are affected and renewed by or on behalf Of the AMISP from time to time in terms of Article 15.

(d) Transportation

15.4 TRANSPORTATION

15.4.1 The AMISP shall at its own risk and expense transport all the AMISP's equipment to the site by the mode of transport that the AMISP judges most suitable under all the circumstances.

15.4.2 Unless otherwise provided in the Contract, the AMISP shall be entitled to select any safe mode of transport operated by any person to carry the AMISP's equipment.

15.4.3 The AMISP shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the

AMISP's equipment to the Project site. Utility shall use its best endeavours in a timely and expeditious manner to assist the AMISP in obtaining such approvals, if requested by the AMISP.

16.Confidential Information

16.1 Both AMISP and the Utility undertake to each other to keep confidential all information (written as well as oral) concerning the business and affairs of the other, which has been obtained or received as a result of the discussions leading up to or the entering of the Contract.

16.2 After the entering of the Contract, the Utility and the AMISP shall keep confidential and shall not, without the written consent of the other Party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other Party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the AMISP may furnish to its subcontractors such documents, data, and other information it receives from the Utility to the extent required for the subcontractors to perform its work under the Contract, in which event the AMISP shall obtain from such subcontractors an undertaking of confidentiality similar to that imposed on the AMISP under this Article 16.

16.3 The Utility shall not use such documents, data, and other information received from the AMISP for any purposes unrelated to the Contract. Similarly, the AMISP shall not use such documents, data, and other information received from the Utility for any purpose other than the design, procurement, or other work and services required for the performance of the Contract.

16.3.1 The obligation of a Party under Articles 16.1 and 16.2 above, however, shall not apply to information that:

a) Utility or AMISP need to share with the institutions participating in the financing of the Contract;
b) now or hereafter enters the public domain through no fault of that Party;
c) can be proven to have been possessed by that Party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other Party; or
d) Otherwise lawfully becomes available to that Party from a third Party that has no obligation of confidentiality.

16.3.2 The above provisions of this Article 16 shall not in any way modify any undertaking of confidentiality given by either of the Parties hereto prior to the date of execution of the Contract in respect of the Supply or any part thereof.

16.3.3 Each of the Parties to this Contract, undertakes to the other to take all such steps as shall from time to time be necessary to ensure compliance with the provisions of the above Articles by its employees, agents and sub-contractors.

16.3.4 The provisions of this Article 16 survive completion or termination, for whatever reason, of the Contract.

17. Subcontracting

17.1 The AMISP shall be permitted to appoint subcontractor(s) so as to meet its obligations under the Contract with the Utility, with intimation to the Utility, provided they ensure that any person engaged by AMISP are not blacklisted/ debarred/ banned/ suspended as on date of intimation to the Utility (as defined in Clause 5 under Section 2 of this RFP)."

177.2 AMISP shall engage only such sub-contractor(s) who satisfy the eligibility requirement in terms of applicable laws including the guidelines issued vide Order No. F/No.6/18/2019-PPD by Ministry of Finance, Department of Expenditure, Public Procurement Division dated 23 July 2020 and as amended from time to time.

18. Warranty

18.1 The AMISP 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.

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

18.3 The warranty of the AMI system shall remain valid till expiry of the Contract Period.

18.4 The AMISP 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. AMISP 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.

18.5 The maintenance of the system supplied & installed by the AMISP shall be comprehensive. The AMISP shall be responsible for providing all the spares as may be required. The spares shall be maintained by the AMISP at no extra cost to the Utility.

18.6 At the end of the contract or at the time of transfer in case of termination under article 11, the meters shall have a warranty of five years from their installation.

19. Change in Laws and Regulations

19.1 Unless otherwise specified in the Contract, if after the Bid Submission Deadline indicated in **SCC**, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in India where the sites is located (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the project delivery, then such delivery shall be correspondingly amended, to the extent that the AMISP has thereby been affected in the performance of any of its obligations under the Contract.

19.2 The Party affected by a change in law shall give notice giving details of the likely impact of the change in law. The Parties shall negotiate in good faith to place the affected party at the same economic position as if no change in law had occurred. Provided only such change in law events which have financial impact beyond a threshold specified in **SCC**, are to be considered for the purposes of grant of relief to the affected Party.

19.3 Notification of Change In Law: If the AMISP is affected by a Change in Law in accordance with Article 19.1 and wishes to claim relief for such Change in Law under this Article 19, it shall give notice to the Utility of such Change in Law as soon as reasonably practicable after becoming aware of the same. Any notice served pursuant to Articles 18 shall provide, amongst other things, precise details of the Change in Law and its effect on the AMISP.

20. Severability

20.1 If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract or the

Contract as a whole and the remaining provisions of the Contract shall remain in full force and effect.

21. Language

21.1 The official language of the Contract is English. Contract as well as all correspondence and documents relating to the Contract exchanged by the AMISP and Utility, shall be written in English. Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Contract, the English translation shall govern.

21.2The AMISP shall bear all costs of translation to English and all risks of the accuracy of such translation. The AMISP shall be bound to the English translation and what has been stated therein.

22. Assignment

22.1 The AMISP shall not assign, in whole or in part, their obligations under this Contract without prior permission of the Utility.

22.2 The permission for assignment of whole or part of the AMISP's obligations of this contract shall only be requested/permitted at least two years after Installation Milestone.

22.3 However, in case of default by the AMISP in debt repayments or in the event of default by the AMISP as per Article 11 of Section 7, the Utility may facilitate the Lenders to substitute the existing AMISP with their nominee AMISP subject to the fulfilment of the qualification requirements and provisions of the Contract and subsequently execute an amendment to this Contract.

23. Entire Agreement

23.1 This Contract along with all its annexures, schedule and the provisions of the RFP reflect the entire understanding of the Parties.

23.2 No variation or modification of the terms of the Contract shall be made except by written amendment signed by the Parties.

24. Disclaimer

24.1 Utility reserves the right to share, with any consultant of its choosing, any resultant proposals in order to secure expert opinion.

24.2 Utility reserves the right to accept any proposal deemed to be in the best interest of the Utility.

25. Public Disclosure

25.1 All materials provided to Utility by the AMISP may be disclosed in accordance with the provisions of applicable law including but not limited to the Right To Information Act, 2005 (RTI), etc.

25.2 The AMISP's team shall not make or permit to be made a public announcement or media release about any aspect of this Contract unless Utility first gives the AMISP its written consent.

26. Adherence to Safety Procedures, Rules, Regulations and Restriction

26.1 AMISP shall comply with the provision of all laws including labour laws, rules, regulations and notifications issued there under from time to time. All safety and labour laws enforced by statutory agencies and by Utility shall be applicable in the performance of this Contract and AMISP's team shall abide by these laws.

26.2 Access to the Utility's locations shall be strictly restricted. No access to any person except the designated personnel belonging to the AMISP who are genuinely required for execution of work or for carrying out management/maintenance who have been explicitly authorized by Utility shall be allowed entry to the Utility's locations. Even if allowed, access shall be restricted to the pertaining equipment of Utility only. The AMISP shall maintain a log of all such activities.

26.3 The AMISP shall take all measures necessary or proper to protect the personnel, work and facilities and shall observe all reasonable safety rules and instructions. AMISP's team shall adhere to all security requirement/regulations of Utility during the execution of the work. Utility's employees and associates also shall comply with safety procedures/policy.

26.4 The AMISP shall report as soon as possible any evidence, which may indicate or is likely to lead to an abnormal or dangerous situation and shall take all necessary emergency control steps to avoid such abnormal situations.

26.5 Utility will be indemnified for all the situations mentioned in this Article in the similar way as defined in Article 12.

27. Non- Solicitation of Staff

27.1 The Articles of this contract, which by nature are intended to survive termination of this Contract, shall remain in effect after such termination

28. Survival

28.1 The Articles of this contract, which by nature are intended to survive termination of this Contract, shall remain in effect after such termination.

28.2 In the event AMISP is a consortium and a Party proposes to cease to be a member of the Consortium it shall send a notice to the Utility and all other members of the Consortium. In the event no objection is received from the Utility and/ or other Consortium Member within 15 days of the receipt of notice, the Consortium Member shall be entitled to leave the Project after giving a notice of 7 days.

28.3 Notwithstanding that exit of any member of the consortium the Lead Consortium Member shall be responsible for development of the Project and compliance with the terms and conditions of this AMISP Contract.

28.4 In the event Lead Consortium Member proposes to bring in a new entity for implementation of the Project, such new entity shall execute a deed of adherence stating that it shall comply with the provisions of the Consortium Agreement and the AMISP Contract. Also, the new entity, as on date of replacement shall, satisfy the qualification requirements as mentioned in section 3: Eligibility and Qualification requirements.

29. Notices

29.1 All notices to be given under this Contract shall be in writing and in the English language.

29.2 A Notice shall be effective when delivered or on the notice effective date, whichever is later.

29.3 All notices must be delivered personally, by registered or certified mail or by facsimile transmission or email.

29.4 All notices shall be effective:

a) If sent by facsimile transmission or email, when sent (on receipt of confirmation of the correct number or address);
b) If sent by registered post or certified mail, within 5 (five) days of dispatch;
c) If delivered personally, on receipt by intended recipient, provided that all notices given by facsimile transmission shall be confirmed by registered or certified mail.

29.5 Each party shall forthwith notify the other party of any change in its address to which notices under this Contract are to be delivered, mailed or facsimiled.

30. Additional Security

30.1 The AMISP has furnished Additional Security in the form of an irrevocable bank guarantee valid up to a period of 6 (six) months beyond a period of two years after the Installation Mile stone or extended thereafter, for the amount indicated in **SCC** on the prescribed format. However, in case of delay in Installation Milestone, the validity of the initial Additional Security shall be extended by the period of such delay. In the event delay is solely due to acts and/ or omission of the Utility cost of extending the validity of Additional security shall be reimbursed to the AMISP by the Utility.

30.2 Any payments shall be made to the AMISP only after receipt of the additional security by Utility.

30.3 Upon achievement of the Installation Milestone, the value of the additional security shall be reduced by AMISP, to the extent indicated in **SCC** as determined in accordance with numbers of meters considered for Installation Milestone.

30.4 Upon Termination of the Contract due to Utility Event of default or completion of a period of two years after the installation milestone, the additional Security shall be discharged by Utility without any interest and returned to the AMISP not later than 14 (fourteen) working days following the date of Termination of the Contract or completion of a period of two years after the installation milestone.

30.5Upon Termination of the Contract due to AMISP Event of default, the additional security shall be forfeited by Utility.

30.6In case of any delay by the AMISP in performing the activities of the scope of work with respect to the Project Implementation Schedule, then upon Utility's request, the AMISP shall extend the validity of the additional Security for the period for which the installation milestone is extended. In the event delay is solely due to acts and/ or omission of the Utility cost of extending the validity of additional Security shall be reimbursed to the AMISP by the Utility.

~~**31. [Advance Payment security (Optional)]**~~

~~30.1 [*Utility, at its discretion, may provide to the successful bidder an interest-bearing advance payment against an advance payment security furnished by the successful bidder in the form of a bank guarantee for [15] % of the Contract Price.*~~

~~30.2 *Within 14 (fourteen) Days of the receipt of Letter of Award from the Utility, the Successful Bidder shall furnish the Advance Payment Security, using for that purpose the format of Advance payment Security given in Form 4 in Section 8.*~~

~~30.3 *The utility shall provide an advance payment for [70] % of the advance payment security furnished by the successful bidder, at the time of contract signing.*~~

~~30.4 *The amount of the security shall be reduced in proportion to the value of the services executed by and paid to the successful bidder from time to time and shall automatically become null and void when the full amount of the advance payment has been recovered by the Utility. The security shall be returned to the successful bidder immediately after its expiration*~~

~~30.5 *The interest rate on advance payment shall be Marginal Cost of Funds Based Lending Rate (MCLR) for one year of the State Bank of India, prevailing on the date of advance payment to the Successful Bidder. The interest accrued on interest bearing advance shall be adjusted first before releasing any payment. The interest rate shall be calculated on the daily progressive balances outstanding as on the date of recovery/adjustment i.e., on daily rest basis.]*~~

III. Special Conditions of Contract

<table>
<tr><th>GCC Article/ Clause</th><th>Amendments of, and Supplements to, Clauses in the General Conditions of Contract</th></tr>
<tr><td>1.1 (b)</td><td><Name of the successful Bidder/ AMISP></td></tr>
<tr><td>1.1 (j)</td><td>< To indicate whether if SPV is applicable or not ></td></tr>
<tr><td>1.1 (y)</td><td><The Utility to indicate here the number, name and salient details of the RFP></td></tr>
<tr><td>1.2.12</td><td>
The methodology for determining the ‘Total Meter-Months’ as well as ‘Operation and Maintenance Period of the AMI system’ is provided below:
Assuming a deployment of 10 Lakh Smart Meters to be installed in Project area A, ‘Total Meter-Months’ is determined as below:
‘Total Meter-Months’ = (Total number of smart Meters to be installed in the AMI Project X 93 months) = 10 Lakh meters X 93 months = 930 lakh meter-months (A)
The implementation of the AMI system is aligned to the schedule provided above. This implies the following:
a) 50,000 Smart Meters (5% of total) are operationalized at the end of 7th Month from date of execution of the Contract;
b) From there on, ~40,909 Smart Meters (4.09% of total) are operationalized every month till 500,000 Smart Meters (50% of total) are operationalized at the end of 18th Month from date of execution of the Contract;
c) From there on, 55,555 Smart Meters (5.55% of total) are operationalized every month till 10,00,000 smart meters (100% of total) are operationalized at the end of 27th Month from date of execution of the Contract.

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 7th Month from date of execution of the Contract. Hence, ‘Meter-Months’ of AMI system operated after operational go-live is determined as below:
<table>
<tr><th>Month</th><th>Total Smart Meters Installed</th><th>Meter-Months</th></tr>
<tr><td>7</td><td>50,000</td><td>0</td></tr>
<tr><td>8</td><td>90,909</td><td>50,000</td></tr>
<tr><td>9</td><td>1,31,818</td><td>90,909</td></tr>
<tr><td>10</td><td>1,72,727</td><td>1,31,818</td></tr>
<tr><td>11</td><td>2,13,636</td><td>1,72,727</td></tr>
<tr><td>12</td><td>2,54,545</td><td>2,13,636</td></tr>
<tr><td>13</td><td>2,95,455</td><td>2,54,545</td></tr>
<tr><td>14</td><td>3,36,364</td><td>2,95,455</td></tr>
<tr><td>15</td><td>3,77,273</td><td>3,36,364</td></tr>
<tr><td>16</td><td>4,18,182</td><td>3,77,273</td></tr>
<tr><td>17</td><td>4,59,091</td><td>4,18,182</td></tr>
</table>
</td></tr>
</table>

18	5,00,000	4,59,091
19	5,55,556	5,00,000
20	6,11,111	5,55,556
21	6,66,667	6,11,111
22	7,22,222	6,66,667
23	7,77,778	7,22,222
24	8,33,333	7,77,778
25	8,88,889	8,33,333
26	9,44,444	8,88,889
27	10,00,000	9,44,444
Total	**1,000,000**	**93,00,000**

Basis the above table, the AMI System would have been already operational for 93,00,000 meter-months prior to Installation Milestone(B)
Hence, AMI system will remain operational for the remaining Contract period, i.e.,
= ['Total Meter-Months' (A) – 'Meter-Months' of prior to Installation Milestone (B)] (C)
= (9,30,00,000 – 93,00,000) meter-months
= 8,37,00,000 meter-months (C)
Time period (in months) for operating AMI system after Installation Milestone is,
= [Remaining 'Meter-Months' / (Total number of Smart Meters installed in the AMI Project)] (D)
= 8,37,00,000 / 10,00,000
= ~83.70 months
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) = 20 months + 83.70 months = 103.70 months

The above methodology has been illustrated in the graphic at Annexure I (SCC)

5.1.1

Contract Price is INR [X] <Utility to insert to figure based on the total project cost as provided in Form 1 given in Section 5>

5.2.3

S. No.	Deliverable	Payment
1.	i. Monthly documentation/ records/ test certificates/ etc. during Post-Operational Go-Live Phase a. Monthly progress report briefing the status of installation of meters and meter boxes on pro-rata basis, including problems that arise with the installed	= AMISP Service Charge (as per Table- Bill of Materials and Services for Smart Meters in Form 1 given in Section 5) X total number of meters in operation and maintenance phase at the end of each month Post-Operational Go-Live Plus

		AMI system (if any) as well any cyber security related issues and corrective action taken by AMISP for the same; b. Change Notes c. Reports as mentioned in this Contract which includes but not limited to the following: i. Service Level Agreement (SLA) performance report; ii. Energy Audit report; iii. Other reports as per mentioned in Clause 6.2.2 of the Section 6;	Lumpsum payment rate per meter (as per Table- Bill of Materials and Services for Smart Meters in Form 1 given in Section 5) X total number of new smart meters installed and integrated for which Lumpsum payment has not been made earlier, if any Plus Payment towards change request/new requirement completed, if any (as per Table- Bill of Materials and Services for Smart Meters in Form 1 given in Section 5) Plus Agreed rate for replacement of meters X Number of meters replaced due to vandalism, theft, etc.
	2.	Quarterly documentation/ records/ test certificates/ etc. during Post-Operational Go-Live Phase a. As-Built Drawings; b. Update consumer indexing as per the implemented AMI system.	*<To be made on every third month of each quarter of the Contract Period as defined by the Utility>* = AMISP Service Charge X total number of meters in operation and maintenance phase at the end of each month Post-Operational Go-Live Plus

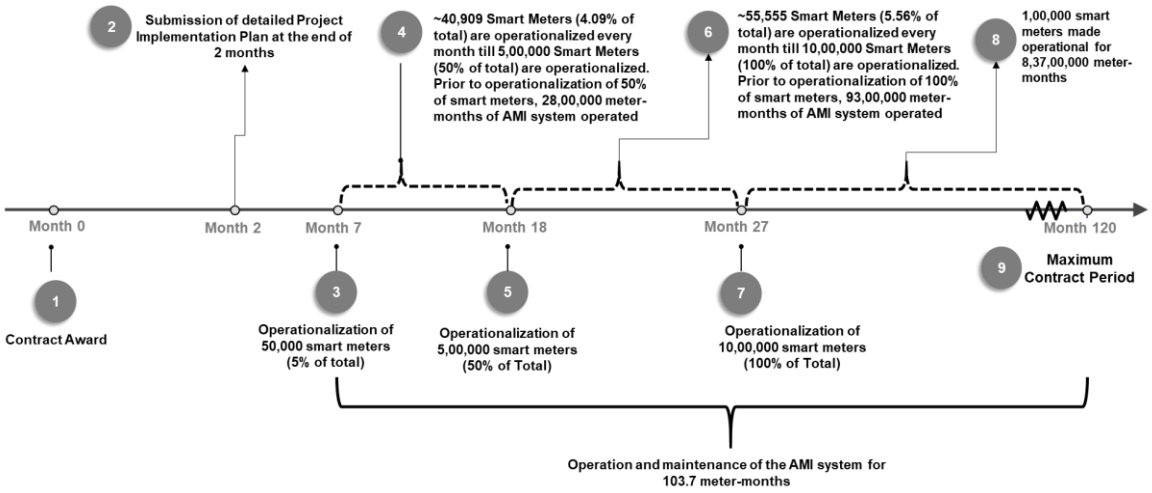
			Lumpsum payment rate per meter X total number of new smart meters installed and integrated for which Lumpsum payment has not been made earlier, if any Plus Payment towards change request/new requirement completed, if any Plus Agreed rate for replacement of meters X Number of meters replaced due to vandalism, theft, etc.

	3.	Annual documentation/ records/ test certificates/ etc. during Post-Operational Go-Live Phase a. Cyber Security Audit; b. Data Privacy Audit report; c. Updated Exit Management Plan	*<To be made on every last month of each year of the Contract Period as defined by the Utility>* = AMISP Service Charge X total number of meters in operation and maintenance phase at the end of each month Post-Operational Go-Live Plus Lumpsum payment rate per meter X total number of new smart meters installed and integrated for which Lumpsum payment has not been made earlier, if any Plus Payment towards change request/new requirement completed, if any Plus Agreed rate for replacement of meters X Number of meters replaced due to vandalism, theft, etc.
6.1	[3% of the Contract Price or as per the prevalent GoI guidelines/ Orders], if the selected bidder is a consortium or a Sole Bidder		
6.2	[1.5] % of the Contract Price, if the selected bidder is a consortium or a Sole Bidder		
7.3	An illustrative example for arriving at the deductions is given in Annexure II(SCC)		
7.4	A sum equivalent to [1]% of the Contract Price		
11.5.3 (a)	[60] %		

11.5.3 (b)	[100]%
11.5.3 (c) i	[60]%
11.5.3 (c) ii	[100] %
11.5.4 (a)	[10.5] %
13.5	[insert state capital where Utility is operating]
13.6	[insert state capital where Utility is operating]
14.1	[-20%] to [+30%]
19.1	<indicate the Bid Submission Deadline date>
19.2	[0.2 % of the Contract Price]
30.1	[2.5] % of the Contract Price, in case the share of equity participation in the SPV of any consortium member is less than 10% or if any consortium member is not willing to be a part of the SPV to be formed, except in the case when the said consortium member is a CPSE/ PSU or a subsidiary/ Joint venture of a CPSE/ PSU. If a Central Public Sector Enterprise (CPSE) / Public Sector Undertaking (PSU) or Subsidiary/ Joint Venture of a CPSE/ PSU is either the sole Bidder or a lead member of a Bidding Consortium, the bidder shall be exempted from providing an additional security.
30.3	[1.25] % of the Contract Price, in case the share of equity participation in the SPV of any consortium member is less than 10% or if any consortium member is not willing to be a part of the SPV to be formed, except in the case when the said consortium member is a CPSE/ PSU or a subsidiary/ Joint venture of a CPSE/ PSU.

Annexure I (SCC)

Graphic Illustration



*

Annexure II (SCC)

*< For example, in case AMISP delays installation of say 100 similar type of meters by say 5.5 months out of a total meter installation of 1000 meters assuming AMISP Service Charges as Rs. 50 /meter/month for such meter. Liquidated Damages would be worked as 5*50*100*50%= Rs.12,500. Maximum Liquidated Damages that can be deducted in case of delay of say 13 months is limited to 12 months i.e., 12*50*100*50%= Rs. 30,000. Further, Liquidated Damages will be levied as per the delay of Goods i.e., if 80 meters are implemented after 5 months of delay and rest 20 meters are implemented after 12 months of delay, then LD would be 5*80*50*50%+12*20*50*50% = Rs. 16,000. In the event more than one type of meter are delayed, the LD would be calculated for each category of the meter on basis of their respective AMISP Service Charge >*

Appendix A – Project Requirements (AMI System Requirements and Service Level Agreement)

[This Appendix shall include Section 6 of the RFP Document including all amendments/ clarification etc. thereto]

Appendix B - AMISP Charges including AMISP Service Charges

[This Appendix shall include Bill of Material given in Section 5 of the RFP Document and the charges agreed therefor]

PART III

Contract Related Forms

Section 8. Contract Related Forms

Form No.	Document
1	Performance Security as per the format prescribed in Form 1
2	Letter of Award as per the format prescribed in Form 2
3	Additional security as per the format prescribed in Form 3
4	Format for Bank Guarantee for Advance payment in Form 4 *(Optional)*

Form 1: Format of Performance Security

[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.]

Reference No. ……. Bank Guarantee No. ……. Dated: …….

To:
[Utility]
[Address]

Dear Sir/ Madam,

WHEREAS……. *[Insert name of the Lead Consortium Member/ Sole Bidder]* with address ……. [*Insert address of the Lead Consortium Member/ Sole Bidder]* having its registered office at ……. [*Insert address of the Lead Consortium Member/ Sole Bidder*] (hereinafter, the "Selected Bidder"), subsequent to participation in Tender No. [Tender Details] (the "RFP") issued by [Utility] (hereinafter, the "Beneficiary") for Appointment of AMI Service Provider for Implementation of AMI Project in pre-paid mode, have been issued the Letter of Award as the Selected Bidder. The Selected Bidder was required to incorporate a Special Purpose Vehicle (SPV) for implementation of the project. The Selected Bidder has formed an SPV in the name of ……. *[Insert name of the SPV]*having its registered office at ……. [*Insert address of the SPV]* (hereinafter, the "AMISP/ Contractor")

And WHEREAS a Bank Guarantee for Rupees ……. *[Insert amount in words equivalent]* (…….) *[Insert amount in figures]* valid till……. [*Insert Contract Period*] is required to be submitted by the Selected Bidder to the Beneficiary for due performance of the Contract by the AMISP as per the terms and conditions of the RFP.

We,…….*[Insert name of the Bank and address of the Branch giving the Bank Guarantee]* having our registered office at …….[Insert address of the registered office of the Bank] hereby give this Bank Guarantee No. …….[Insert Bank Guarantee number] dated …….[Insert the date of the Bank Guarantee], and hereby agree unequivocally and unconditionally to pay immediately on demand in writing from the Beneficiary through any officer authorized by it in this behalf, any amount not exceeding Rupees ……. [Insert amount in words] (…….) [Insert amount in figures] to the said Beneficiary withoutany demur, reservation, contest, recourse or protest and/or without any reference to the Selected Bidder/Contractor. Any such demand made by the Beneficiary on the Bankshall be conclusive and binding notwithstanding any difference between the Beneficiary and the Selected Bidder/ Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority.

We ……. *[Insert name of the Bank]* also agree that non-performance, delayed performance or violation of any of the terms and conditions of the contract by AMISP would constitute a default on the part of the Selected Bidder and that this Bank Guarantee is liable to be invoked and encashed within its validity by the Beneficiary in case of any occurrence of a default on the part of the AMISP or the Selected Bidder and is liable to be forfeited by the Beneficiary.

This agreement shall be valid and binding on this Bank up to and inclusive of ……. [*Insert the date of validity of the Bank*] and shall not be terminable by notice or by Guarantor change in

the constitution of the Bank or the firm of the Selected Bidder or AMISP or by any reason whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, conceded with or without our knowledge or consent by or between the Selected Bidder, AMISP and the Beneficiary.

NOTWITHSTANDING anything contained hereinbefore, our liability under this guarantee is restricted to Rupees ..... *[Insert amount in words equivalent*]. Our Guarantee shall remain in force till ……. *[Insert the contract period]*. Unless demands or claims under this Bank Guarantee are made to us in writing on or before……. [*Insert contract period*], all rights of the Beneficiary under this Bank Guarantee shall be forfeited, and we shall be released and discharged from all liabilities there under.

[Insert the address of the Bank with complete postal branch code, telephone and fax numbers, and official round seal of the Bank]

[Insert signature of the Bank's Authorized Signatory]

Attested:

……. [Signature] (Notary Public)

Place: …….Date: …….

INSTRUCTIONS FOR SUBMITTING BANK GUARANTEE

1. Bank Guarantee to be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.
2. The Bank Guarantee by Bidder shall be given from the Scheduled Commercial Banks.

Form 2: Format of Letter of Award

Sub: Bid for Appointment of AMISP for Smart Prepaid Metering on DBFOOT basis

REF: - 1. Request for Proposal for selection of AMISP dated [•] ("RFP")
2. Your proposal dated [•] ("Proposal")
3. Your clarification [•]

Dear Sir,

1. This is in reference to your Proposal in relation to the RFP.

2. Pursuant to the evaluations of the Bid, your bid has been found to be most suited.

3. <*applicable in the event the Selected Bidder is a sole bidder or a bidding Consortium with the lead consortium member not being a CPSE/ PSU or subsidiary/ Joint venture of a CPSE/ PSU*>You are requested to please take steps for incorporation of the SPV in terms of the RFP for execution of the AMISP Contract. The execution of the AMISP Contract shall happen only after you have furnished the performance security in terms of the RFP.

4. A draft of the AMISP Contract was provided to you along with the RFP. Please note that there shall be no change whatsoever in the terms and conditions as set out in the draft Contract.

5. Please note that in the event of failure to comply with any terms and conditions of this Letter of Award, the entire Bid Security may be forfeited.

6. Any further correspondence in connection with the Project should be addressed to the [insert details of the appropriate authority •]" with a copy to Chairman/ Managing Director, till further instructions are issued.

7. The terms and conditions as set out in this Letter of Award shall stand valid until execution of the AMISP Contract.

8. Please acknowledge the receipt and return the duplicate copy of this Letter of Award after signing and stamping it in all the pages to the undersigned as a token of acceptance.

Thanking You

Yours truly
[insert details of the Utility]

Reference No. ……. Bank Guarantee No. ……. Dated: …….

Form 3: Format of Additional Security

[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.]

Reference No. ……. Bank Guarantee No. ……. Dated: …….

To:
[Utility]
[Address]

Dear Sir/ Madam,

WHEREAS……. *[Insert name of the Lead Consortium Member/ Sole Bidder]* with address ……. [*Insert address of the Lead Consortium Member/ Sole Bidder]* having its registered office at ……. [*Insert address of the Lead Consortium Member/ Sole Bidder*] (hereinafter, the "Contractor"), subsequent to participation in Tender No. [Tender Details] (the "RFP") issued by [Utility] (hereinafter, the "Beneficiary") for Appointment of AMI Service Provider for Implementation of AMI Project in pre-paid mode, have been issued the Letter of Award as the Selected Bidder. The Selected Bidder was required to incorporate the AMISP. Further the AMISP was required to furnish an additional Security in the form of a Bank Guarantee on behalf of ……. [Insert names of the Consortium Members] with address ……. [Insert addresses of the Consortium Members] having its registered office at ……. [Insert address of the Consortium Members] (hereinafter, the "Consortium Member"), [whose % of equity participation in the SPV to be formed is less than 10%] (OR) [who is not going to be a part of the SPV to be formed]

And WHEREAS a Bank Guarantee for Rupees ……. *[Insert amount in words equivalent]* (…….) *[Insert amount in figures]* valid till……. [*Insert Additional security validity period*] is required to be submitted by the AMISP as per the terms and conditions of the RFP.

We,…….*[Insert name of the Bank and address of the Branch giving the Bank Guarantee]* having our registered office at …….[Insert address of the registered office of the Bank] hereby give this Bank Guarantee No. …….[Insert Bank Guarantee number] dated …….[Insert the date of the Bank Guarantee], and hereby agree unequivocally and unconditionally to pay immediately on demand in writing from the Beneficiary any officer authorized by it in this behalf any amount not exceeding Rupees ……. [Insert amount in words] (…….) [Insert amount in figures] to the said Beneficiary on behalf of the Contractor.

We ……. *[Insert name of the Bank]* also agree that non-performance, delayed performance or violation of any of the terms and conditions of the contract by AMISP would constitute a default on the part of the Bidder and that this Bank Guarantee is liable to be invoked and encashed within its validity by the Beneficiary in case of any occurrence of a default on the part of the AMISP or the Selected Bidder and that the encashed amount is liable to be forfeited by the Beneficiary.

This agreement shall be valid and binding on this Bank up to and inclusive of ……. [Insert the date of validity of the Bank] and shall not be terminable by notice or by Guarantor change in the constitution of the Bank or the firm of the Bidder Or by any reason whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, conceded with or without our knowledge or consent by or between the Bidder and the Beneficiary.

NOTWITHSTANDING anything contained hereinbefore, our liability under this guarantee is restricted to Rupees ..... *[Insert amount in words equivalent*]. Our Guarantee shall remain in force till ……. *[Insert the contract period]*. Unless demands or claims under this Bank Guarantee are made to us in writing on or before……. [*Insert contract period*], all rights of the Beneficiary under this Bank Guarantee shall be forfeited, and we shall be released and discharged from all liabilities there under.

[Insert the address of the Bank with complete postal branch code, telephone and fax numbers, and official round seal of the Bank]

[Insert signature of the Bank's Authorized Signatory]

Attested:

……. [Signature] (Notary Public)

Place: …….Date: …….

INSTRUCTIONS FOR SUBMITTING BANK GUARANTEE

1. Bank Guarantee to be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.
2. The Bank Guarantee by Bidder shall be given from the Scheduled Commercial Banks.
3. Lead bidder shall execute separate bank guarantees for each of the consortium members, on behalf of whom, the additional security is being provided.

+

x

TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT SINGLE PHASE (5-30Amp or 5-60Amp) LT STATIC WHOLE CURRENT ENERGY METERS WITH BACKLIT LCD DISPLAY AND OPTICAL COMMUNICATION FACILITY (For Consumer Metering)

Guideline:

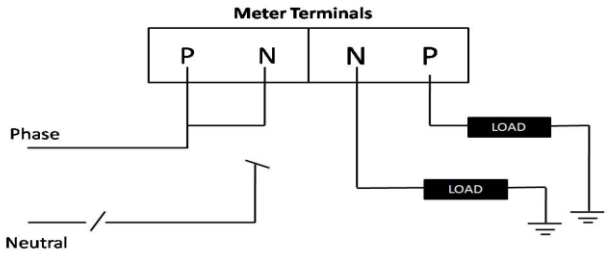
1. In case of deviation in the below mentioned technical specifications from the applicable IS (IS:16444 Part-I & IS:15959 Part-II with latest amendment) , then the AMISP has to comply with the IS:16444 Part-I & IS:15959 Part-II with latest amendment, wherever applicable.

1. SCOPE:-

a. This specification covers design, engineering, manufacture, stage-inspection, testing and supply of A.C. Single Phase (1 Ø) Whole Current Smart Meter with NIC card (Rating: 5-30 A) with starting & Limits of Error test as per 5A Ib) solid state(static) whole current electronic LT energy meters of accuracy class1.0 with backlit LCD display and communication port for data downloading as per requirement given in this specification. The meters shall be supplied in a Hinge type meter box made of transparent engineering plastic, which shall be weather proof having flame retardant properties conforming to relevant specification. The meter and Hinge type meter box shall be supplied in suitable packing so as to with stand transits hocks during road transport.

The meters should be suitable for single phase two wire system, capable to record and display monthly average p.f., energy in KWH, and demand in "KW" including other electrical quantities. The meters shall be capable to record over full power factor range of Zero Lag-Unity-Zero Lead, as per requirement given in this specification. These LT Meters should record total energy at basic frequency & harmonics. In addition the meters shall have provision for recording time of day (TOD)energy parameters.

The single phase meter should register energy as per accuracy class even if the incoming phase and neutral terminal of the meter are connected together & only phase is drawn from the supply and load is connected on both phase and neutral or either of the two element of the meter separately and is being run through earth. The meter should record energy as per actual current drawn.



b. It is not the intent to specify completely herein all the details of the design and construction material. However, the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to the Purchaser, who will interpret the meanings of drawings and specification and shall have the right to reject any work or material which in his judgment is not in accordance there with. The offered materials shall be complete with all components, accessories and required software's necessary for the effective and trouble free operation in the System for measurement of electricity supplied to the consumers. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not.

c. It is compulsory that the offered LT meters shall bear BIS certification i.e. the meters shall be

ISI marked and the bidder shall have to furnish valid ISI license along with the offer (during supply of meters), which, if considered necessary, may be verified by the Purchaser.

d. It is compulsory that bidder must possessISO9001, ISO 14001 & ISO 27001certification. The bidder must have certificate of Capability Maturity Model Integration (CMMI) level 3 certification issued by recognized body SEI (software Engineering Institute).

The meter shall be encapsulated/ chemical welding with break to open type designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design, may have option to provide one single sealing hole capable to accommodate 02 nos. seal, 01 no. seal provide by manufacturer at its works and another seal will be provided by utility after testing.

2. STANDARDS:

These LT meters and the associated accessories shall conform in all respects to the following relevant Standard Specifications with latest amendment thereto:-

Indian Standard No.	Title
IS:13779-1999 and IS 16444 read with latest amendments	Specification for AC static watt hour meter for class 1&2
CBIP Technical report No.325 (with latest amendments)	Specification for A C static Electrical Energy Meters
IS: 15959 with latest amendment	Data exchange for electricity meter reading, tariff and load control – Companion specification.
IS:14772	General requirement for enclosures.
IS:9000	Basic environmental and other Testing for Electronic & Electrical items.
IS:11731	Determination of flammability of solid electrical insulating materials
IS:11000	Resistance to heat& fire
CEA Regulation	On installation of meters- 17/03/06

3. SERVICE CONDITIONS(CLIMATIC CONDITIONS):

(i)The LT meters to be supplied against this specification should be capable of performing and maintaining required accuracy under extreme hot, cold, tropical and dusty climate and solar radiation typically existing in State of M.P. The LT meter shall be required to operate satisfactorily and continuously under the following tropical climatic conditions:

(a)	Maximum ambient air temperature	$55^{o}C$
(b)	Maximum ambient air temperature in shade	$45^{o}C$
(c)	Maximum temperature attainable by the meter exposed to sun	$60^{o}C$
(d)	Minimum ambient temperature	(-) $5^{o}C$
(e)	Average daily ambient air temperature	$40^{o}C$
(f)	Maximum relative humidity	95%

(g)	Number of months of tropical monsoon condition	4 months
(h)	Maxim multitude above mean sea level	1000 meters
(i)	Average annual rainfall	150 cams
(j)	Maximum wind pressure	200kg/sq.m
(k)	Is oceanic level (days per year)	40
(l)	Seismic level (horizontal acne.)	0.30g
(m)	Permitted noise level	45db

All the parts & surface, which are subject to corrosion shall either be made of such material or shall be provided with such protective covering and finish, which ensures total protection from any injurious effect of humidity.

4. PRINCIPAL PARAMETERS:

These LT meters shall conform to the following specific parameters:

S. No.	Item	Specification
1.	Type of installation	Indoor/Outdoor
2.	System voltage (phase to neutral)	240V + 20% to - 40% neutral solidly grounded.
3.	System frequency	50Hz±5%
4.	No. of phases	1 phase 2wire (single Phase +Neutral)
5.	System meathing	Solidly grounded
6.	Resistance to surge voltage of 1.2/50 Micro sec.	As per relevant IS
7.	Testvoltage at50Hz	4KV RMS for 1 minute including latest amendments in relevant IS.

5. CONSTRUCTIONAL REQUIREMENTS:

The Base of the meter should preferably be opaque so that internal circuitry and design are not visible from outside and Hinge type meter box shall be fully transparent /opaque designed and constructed in a manner to avoid any danger during use under normal working condition including personal safety against electric shock. The meter case and Hinge type box should comply following parameters:-

Material Used for Meter case and Hinge type Meter Box:

i. The meters shall have a case, which shall be ultrasonically/chemically welded in case of Encapsulated design to the meter base so that access to the internal parts should not be possible without breaking the meter case. The material of meter body (base and cover) shall be made of Engineering plastic.

ii. The meter casing material should be glass reinforced, flame retardant, unbreakable engineering plastic material to ensure high reliability, long trouble- f r e e life, safety against electric shock, spread of fire and effects of excessive temperature. The material should be corrosion resistant, inert to chemicals, oxidizing agents, petro-chemical products, acids, salts and ultraviolet radiation. The meter chamber shall be dust proof and moisture proof. The supplier should indicate hardness,

melting temperature and tensile yield strength of the material and necessary test certificate of the same shall be furnished. The meter base and cover should be sturdy enough to prevent damage during transportation and installation.

iii. The engineering plastic used shall conform to IS: 11731 besides meeting the test requirement of heat deflection test and as per IS 11000(Part2 sec1) for resistance to heat and fire as per glow wire test specified in the relevant standard.

iv. All electrically live screws shall be of heavily tinned/ nickel-plated brass/ Zinc plated steel. All other screws shall be electro plated

v. The terminal inserts shall be of heavily tinned brass/ nickel or silver plated copper, zinc plated steel.

vi. The meter shall conform to the degree of protection IP51 of IS: 12063 for protection against ingress of dust, moisture and vermin.

vii. The meter should be immune against jump during sudden switching of heavy loads or transient voltage spikes.

6. RATINGS:

The LT meters as specified in scope of this tender shall be rated as follows:

(a)	Voltage	240V
(b)	Current	
(i)	Basic current (Ib)	As per TS
(ii)	Rated max. continuous current (Imax)	As per TS
(c)	Frequency	50Hz
(d)	Accuracy	Class 1.0

7. POWER SUPPLY VARIATION:

The extreme power supply variations which the LT meter should withstand without damage and without degradation of its metering characteristics, as it operates under its normal operating conditions would be as under:

Voltage	+20%to–40%of rated voltage
Current	120%of Imax.
Frequency	±5%of rated frequency
PF range	Zero(lag)–unity –Zero(lead)

The LT meter shall work over wide PF range and the limits of errors with the variation of PF shall be as per CBIP 325(latest amendments)/IS:13779/ IS 16444.

All specifications shall adhere to Technical specifications as per CBIP 325.

8. POWER CONSUMPTION:

8.1 Voltage Circuit: As per IS 16444

8.2Current Circuit: As per IS 16444

8.3Auxiliary Power: The LT meter shall draw power for working of electronic circuit from phase & neutral. Meter will draw power from incoming terminals for its own consumption

9. STARTINGCURRENT:

The LT meter should start registering energy at 0.4% of basic current at UPF as per IS:16444

10. RUNNINGWITH NOLOAD:

When 115% of rated voltage is applied with no current flowing in current circuit, the test output of the LT meter shall not produce more than one output pulse count as per IS:16444.

11. INFLUENCE QUANTITIES:

The single phase LT meter shall work satisfactory with guaranteed accuracy as per limit pre scribed in IS applicable shall be IS:16444 Part-I & IS:15959 Part-II with latest amendment. under presence of the following quantities:-

(i) External magnetic field
(ii) Electromagnetic field
(iii) Radio frequency interference
(iv) Vibration
(v) Harmonic wave form
(vi) Voltage fluctuation
(vii) Electromagnetic high frequency field

12. TEMPERATURE RISE:

a) Under normal conditions of use at Imax current, winding and insulation shall not reach a temperature, which might adversely affect the operation of these LT meters.

b) With each current circuit of the meter carrying rated maximum current and with each voltage circuit (and those auxiliary voltage circuits which are energized for periods of longer duration than their thermal time constant) carrying 1.20 times the rated voltage, the temperature rise of the external surface shall not exceed by more than 20ºC, with the ambient temperature between 25ºC to 45ºC.

13. LIMITS OF ERRORS:

WhentheLTmeterisunderreferenceconditions,thepercentageerrorsshallnot exceed the limits as specified in IS:16444.

14. DISPLAY:

14.1 The LT meters shall have bright LCD Electronic display with backlit & with minimum 6 digits to read up to one tenth of KWh with another digit for legend. The decimal digits shall be clearly distinguished from integer digits. The backlit should not glow during power off condition. The LCD shall be of STN (Super Twist Nematic) type designed suitably to withstand temperature of 80ºC (storage) & 65ºC (operation). The LCD shall be of HTN (high twisted nematic).

(i) When the LT meter remains at a constant temperature of 65^{O}C for a period of 30 minutes, the character of LCD should not deform.

(ii) After keeping the LT meter at a constant temperature of 80^{O}C for a period of 30 minutes and when restores at normal temperature, LCD display should work as in normal conditions.

The LCD display should have a wide viewing angle of 45^{o} to 60^{o} up to one-meter distance, for clear visibility of the display of the meter reading. Large viewing area with large display icons is desired. The registered parameters shall not be affected by loss of power. The display shall not be affected by electrical and magnetic disturbances. The meter shall make use of non-volatile memory capable of storing and retaining all the data required to be stored, without the help of any power source or battery backup and shall have a minimum retention time of 12 years under un-powered condition. The minimum character height shall be 8.5 mm for whole digits of kWh Display. **Dot-Matrix type LCD display is not acceptable**. The accuracy of display for all parameters shall be matching with the accuracy class of meter as per IS.

14.2 The display of various parameters in push button mode shall be scrolling one after another. The display shall have ON time of at least 10seconds for each measured value.

14.3 The meter shall be capable to measure and display continuously “Active Energy KWh” at all loads and in full power factor range of zero lag- unity- zero lead. The LT meter should also have provision for automatic recording and storing of required parameters at 24.00 Hrs on the last day of the month for each calendar month and the same should go to go to memory.

14.4 Meter shall display indications for temper continuously. This indication will reset only after restoration of temper. The meter shall have min 6 digits with '-' indication. Without indication indicates '+'. , parameter identifier, backlit Liquid Crystal Display (LCD) of minimum 10 mm height, wide viewing angle.

15. DISPLAY SEQUENCE:

The Liquid Crystal Display register for single and three phase LT meter should display the measured value(s). The height of the display character should be minimum 8.5 mm. In addition display of the required parameters should be in two different modes as stated hereunder:-

15.1 Auto scroll Display Mode:

The LT meters shall have following parameters in auto scroll display

i) Date: DD: MM: YY Real Time: HH:MM

ii) Cumulative Active Energy KWH total and fundamental KWH; Kwh total and fundamental kwh are essential to follow Regulatory norms.

iii) Instantaneous load in KW in three decimal.

iv) Current Power factor

15.2 Display parameter (Push Button) Mode:

The display of the following parameters shall be scrolling one after the other through push button. The display shall have ‘ON’ time of minimum 10 seconds of each measured value, except LCD segment check. The LCD segment check shall be on meter display for minimum 2 seconds. Display parameters shall move forward if button is pressed prior to the programmed time for display of each parameter.

(a) LCD segment check
(b) Meter serial number
(c) Real date and time (Date DD-MM-YY, Time HH-MM)
(d) Cumulative active energy (KWH) register.
(e) Cumulative apparent energy (KVAH) register.
(f) Maximum demand of the month should be in KW and kVA by default up to two decimal (since last auto reset) with date & time with 15 minutes integration on sliding window principle with sub integration period of not greater than 5 minutes. Cumulative active energy KWH for each calendar month for previous two months with programmed billing date.
(g) Cumulative apparent energy KVAH for each calendar month for previous two months.
(h) Maximum Demand in KW and KVA by default up to two decimal, each calendar month for previous six months with date and time of such demand, Maximum demand of the month shall be in KW and KVA by default & up to two decimal digits
(i) Average PF to be provided for previous 6 months.
(j) Tamper information- this shall be displayed when tampered with following.
(a) Date of last tamper occurrence.

(b)Time of last tamper occurrence.

(c)Number of time meter tampered.

(k) Instantaneous Phase voltage
(l) Instantaneous Phase current
(m) Instantaneous Neutral current
(n) Instantaneous p.f. (With sign of lead/lag)
(o) Instantaneous load in KW and KVA in three decimal
(p) High resolution Energy value (resolution will be sufficient to enable conduction of the starting current and accuracy test in less time).

Since meters are required duly fitted with Hinge type meter box, hence for reading purpose, an arrangement should be made on top cover of Hinge type meter box with its mechanical connection to the meter's body as described in the Specification of meter box to activate the display push button of meter.

The display with push button shall be auto off type after completion of the display cycle it should revert back to normal auto scroll mode approximately after 10 seconds. Fresh button press will be required after resumption of auto scroll cycle to display the above parameters again.

15.3 Meter Reading during Power Outage:

The meter shall have provision to read the meter in no-power condition. The same push button shall be used for display of parameters of auto scroll mode during power outage. In any case, RTC Battery Power shall not be used for display under no-power condition. During power outage, it should be possible to download the meter data though optical port. In battery mode auto and push mode functionality will be same and in Power On mode.

15.4 LCD Least Count:-

The kWh display shall be with one decimal digit in push button mode and in auto scroll mode. The internal least count of the energy recording shall not be more than 0.01 KWh. and every 0.01 KWh, consumption shall be internally stored.

16. COMMUNICATION CAPABILITY

16.1 The meter should have only one communication port i.e. galvanically isolated optical communication port for data communication with CMRI on 9600 bps or higher. The port shall be in line with Indian companion specs. Optical Port and NIC Module will be provided in meter.

Meter Box cover shall be provided with a suitable arrangement (slot) to read the meter Electronically though CMRI by using Optical Cable/Port Directly. The Optical Port Slot on meter cover should meet the standard requirement of IEC1107 for dimensions. The Optical Port slot shall be designed in such a way that there should not be any possibility to insert any wire, tool through the slot to tamper the meter.

The Communication port shall be well protected by software to avoid any chances of tampering and hence no need of sealing arrangement.

The meter shall have ability to communicate with Common Meter Reading Instrument (CMRI) in a secure manner. The interface for communication between MRI & Base computer shall be supplied free of cost. The software required for CMRI and Base Computer System with necessary security provisions shall also be supplied free of cost with the following features:

a. It should not be possible to reset the energy reading in the meter or make any change in the data stored in the meters either current or historical, with the MRI.

b. The optical communication module of the meter shall have no physical access from outside the meter.

c. The clock day/date setting and synchronization shall only be possible through password/key code command from CMRI.

d. Common Meter Reading Instrument (CMRI) to be supported for all category single phase and phase meters: The CMRI shall have possibility to read both communication types of meters purchased by [utility] – optical port [utility] shall exchange reading EXE file for the CMRI of successful bidders. The CMRI without IRDA port shall be accepted. The CMRI shall be able

to read from optical port shall exchange reading EXE file for the CMRI of other successful bidders.

16.2 BILLING POINTREQUIREMENTS:

The predefined date and time for registering the billing parameters of energy, PF and MD as well as Tamper Count and Power-On hours details shall be at 00.00 hours of the first day of each calendar (billing) month and all the billing parameters shall be transferred to billing registers.

The above billing data, TOD register's data, tamper information and instantaneous parameters data shall all be retrievable through the meter's communication port through a common meter reading instrument (CMRI) and shall be transferred (downloaded) to a PC with Windows based software to get complete details in numerical and/or graphic form. The necessary base computer software (BCS) for this purpose shall be provided by the supplier with complete details.

17. TOD TARIFF/DEMAND

The meter should be capable of registering the time-of-day energy (TOD) and maximum demand. The time registers shall be programmable by the purchaser. The meter should have in-built capacity to define up to four registers as per IS:15959. The meter should also have capacity to define multiple time zones within the registers. The change of the TOD time-period(s) or defining TOD registers should be possible through CMRI with special authenticated command from the BCS and Remote command from HES so that only authorized person(s) can make such changes. The main control of this system along with proper security password/code should be available on one or more computers located at the authorized location(s) as per the directions to be given by the Purchaser.

Provision should be made for automatic reset of maximum demand at the end of pre-defined period (e.g. end of the month). **The billing parameters at the time of automatic reset of MD shall be programmed such that it will transfer from rate registers to the irrespective billing registers**. The main control of this system along with proper security password/code should be made available on one or more identified computers located at the authorized location(s) as per the directions to be given by the Purchaser

Necessary compatible meter application software for various programmable features as discussed above in the meter and also necessary software for the compatible computers to obtain various details as discussed above shall be provided by the supplier. No separate cost will be borne by the purchaser on this account.

TOD zones and their Timings:

- TOD 1,2,3 ,4 Cum. KWh & KVAH register (Programmable & Configurable upto 8 TOD timing) for the last 6 Months.

- TOD 1,2,3,4 MD register KW & KVA (Programmable & Configurable upto 8 TOD timing) for the last 6 Months.

- TOD Timing TOD1: 22:00 hrs to 06:00 hrs
  TOD2: 06:00 hrs to 9:00 hrs
  TOD3 9:00 hrs to 17:00 hrs
  TOD4: 17:00 hrs to 22:00 hrs

18. MIDNIGHT ENERGY DATA:

Cumulative active energy KWH and apparent energy KVAH shall be logged at 00.00 Hrs. of every day and shall be maintained for last 45 day on FIFO basis. These daily load profile parameters shall be possible to view at BCS level.

19. TEST OUTPUT DEVICE:

The LT meters shall have a test out put device in the form of calibrating LED of red colour having

minimum intensity 10 M (Milli-candela) accessible from the meter front and shall be capable of being monitored conveniently with suitable testing equipment while operating at site. The location of the calibrating LED should be such that the calibrating pulses can be sensed easily through sensor for site testing of the LT meter's accuracy.

The LT meters shall also give high-resolution energy values on the display. The resolution will be sufficient to enable conduction of the starting current and accuracy test in less time.

20. BASE COMPUTER APPLICATION SOFTWARE to be supported by all category of single and three phase meters.

BCS shall be supplied by AMISP for each type of meter. For efficient and speedy recovery of data read through CMRI, Base computer software shall be supplied having the following specifications stated as under:

The BCS software shall be user friendly Windows based. The Base Computer software shall give all details adequate for analysis. The software shall have the facility to convert all the consolidated information / data of selectable parameters into ASCII, XML format. It should be possible for the purchaser to build its own BCS/CMRI software using DLMS/COSEM (OBIS) standards for direct and bi-directional communication with meters and read/transfer data from meters/CMRI transparently to own database.

Platform: The BCS shall be executable on all WINDOWS system. The BCS shall be suitable to run on Windows-based computers.

Meter Data Display: The software shall show electrical condition existing at the time of reading the meter in tabular forms

All the information about energy, maximum demand and their respective TOD register reading, billing register readings shall be shown in a manner which user can easily understand.

The software shall be capable of preparing CMRI to read the meter information or time setting of the meter.

Support Display: There shall be "user friendly" approach for viewing meter data for the reading collected now or for the reading collected in the past. All information about a particular consumer will be sorted out and available at one place so that locating any consumer's past data is easy. It shall be possible to retrieve/locate data on the basis of either one of the following particulars:

Consumer's ID/Numbers.

Meter Sr. No.

Date of meter reading.

Location.

The Data Transfer: It shall be possible to transfer data to and from CMRI through serial interface.

Configurability: It shall be possible to have selective e printing of all available data of the meter. Print out shall not include anything and everything available with the BCS. The software shall support "print wizard" where by user can decide what to print out. The use of the software need not revert back to the supplier of the software for modifying the software just to print what he desires.

BCS shall have facility to export data to ASCII, XML or spreadsheet format, as the case may be, with adequate built in provision for implementing security against data tampering (e.g. CRC). The API for checking the data while uploading to purchasers system shall also be made available. Here again an "Export wizard" or similar utility shall be available whereby user can select file format, what data to export, the field width selection etc.

Mapping of OBIS code as per DLMS protocol for instantaneous/billing/event/ transaction

parameters shall be checked.

Those Meter Parameters which have not been allocated unique OBIS Codes in the Indian Standards (IS 15959), but are required by the Discom have been earmarked. Unique OBIS Codes are proposed to be allocated to these parameters by the Discom. The same would be made available to AMISP, so that there is a uniformity in Meter Parameter Codes across the Smart meters procured through various manufacturers. This will facilitate integration of MDM with HES.

The details related to mandatory Meter parameters which are desired by Discoms but have not been allocated unique OBIS codes in IS are provided as:

Mandatory Meter Parameters -IS15959

Note:

1. Mandatory parameters for Single phase and three phase meter:

- Parameters under head of Missing/ shortfall are derived parameters which can be derived from primary parameters as per IS.
- Parameters under Load survey are derived parameters which can be derived from primary parameters.
- Daily survey parameters can be derived at system meter end i.e., KWh & Kvah.

2. Mandatory parameters for three phase meter:

- For load connection and disconnection relays are only feasible in phases. Neutral relay is not required and has been deleted.
- All relays shall be connected/disconnected simultaneously so a Relay status parameter as per IS15959 part2 is recommended.

Security: The BCS 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 protecting by different passwords. The configurable of passwords shall be user definable. The software installed on one PC shall not be copy able on another PC.

Help: The exhaustive online help shall be available with the software so that user can use all the features of the software by just reading the help contents.

It shall be responsibility of the meter manufacturer to provide DLMS Compliant CMRI & Base Computer Software and all the facilities and support required by the purchaser,to use the CMRI for readingandretrievingthedatafromthemeterandtodownloadthedatatoBase Computer on free of cost basis till the life time of meter.

As the meters are DLMS Compliant therefore the CMRI & Base Computer Software shall be common i.e. CMRI & BCS can read, dump and view any make of DLMS Compliant Meter. Manufacturer shall provide the LLS and HLS to the Purchaser. CMRI shall have provision to store the LLS and Base Computer Software shall have provision to store the LLS and HLS both of other make of meters also. It should be possible to change the HLS related configuration through the hand held meter-reading device with special authenticated command from the BCS so that only authorized person(s) can make such changes. The main control for this change along with HLS should be available on the computer located at the metering office.

If the bidder is an old supplier of the Purchaser then they have to provide the above software with competency to ready their earlier supplied meters with proprietary protocol.

21. Common Meter Reading Instrument (CMRI) to be supported for all category single phase and 3 phase meters

The manufacturer shall provide the protocol and other information to interpret the transmitted billing data. The data storage inside the CMRI and communication of CMRI with the meter shall be encrypted so that there is no possibility of tampering with the downloaded data. CMRI and BCS shall be made available by AMISP. BCS shall be supplied by AMISP for each type of meter.

The salient points of CMRI are mentioned below

a. **01 (one) CMRI shall be supplied with each lot of 20000 nos. of meters** along with battery charger. Android (Android version 12 or latest) based CMRI, 1 per 20,000 meters shall be provided by AMISP (it will be handed over to Discom along with the Set of Meters).

b. An undertaking shall invariably be submitted by the bidder to the effect that their CMRI shall be capable for down loading readings of other makes and types of meters.

c. Common Meter Reading Instrument (CMRI) to be supported for all category single phase and 3 phase meters:

d. The CMRI shall have possibility to read both communication types of meters purchased by [utility] – optical port [utility] shall exchange reading EXE file for the CMRI of successful bidders. The CMRI without IRDA port shall be accepted. The CMRI shall be able to read from optical port shall exchange reading EXE file for the CMRI of other successful bidders. Common Meter Reading Instrument (CMRI) to be supported for all category single phase and phase meters: The CMRI shall have possibility to read both communication types of meters purchased by [utility] – optical port [utility] shall exchange reading EXE file for the CMRI of successful bidders.

e. If required [utility] shall be free to exchange the communication protocols of successful bidders amongst each other without insisting for any Non Disclosure Agreement (NDA) etc. No stipulations or conditions shall be acceptable to this effect.

f. The optical mode of CMRI shall have a feature to read meters without pre programming the meter serial numbers. Even in case of IrDA port, CMRI shall have a feature to read multiple meters within the range without pre-programming the meter serial numbers in advance.

g. The data download time shall not exceed 10 Minute.

h. After successful downloading, indication shall be available on both meter and CMRI.

i. The CMRI shall

- have Microprocessor based design.
  CMRI and android (Android version 12 or latest) based solution can be made available by AMISP.
- have legible large graphics LCD display with backlit of adequate size to display reading menu, Phasor diagram and other information in readable font size from an ideal reading distance with easy readability in varying ambient light condition.
- The size of upper case alpha character shall be at least 3mm.
- The CMRI shall have minimum memory capacity of 8 GB;
- BIOS/OS on flash/EEPROM memory. The system should be upgradeable to higher capacities at a later date, if required.
- Provided with necessary software for loading application programs via a serial port for uploading and down loading between CMRI and base computer station (BCS).
- have provision for loading the software of specific makes of meters into the CMRI for the purpose of reading and programming the specific make's of energy meters.
- have Alphanumeric keypad / virtual keypad on LCD should be such that the selection of option on the display could be done easily.
- have legible and non-fading keypad imprints.
- have feedback for key press acknowledgement (beep) for user.
- have enclosure of ABS/Polycarbonate or better insulating material of high thermal stability, mechanical strength. The degree of protection shall confirms to IP65 as per IS12063/IEC529.
- have built in module of all the standard communication ports viz. IrDA such that external ports shall be free for use with other devices if any.
- support LPR meter reading by using external LPR module provided by the LPR meter manufacturer if required by [utility] at later stage.
- have detachable Standard universal optical cord.

- have detachable 9 pin D type connector for connection with optical port interface outside the sealed meter box.
- have separate socket for battery charger adopter.
- The meters are required to be offered with AMR Compability, and should be as per IS 16444
- The updates of application programs/ communication protocols of different meters type shall be made available as web-updates downloadable to CMRI from BCS.
- have USB port or provided with external adaptor cable RS-232 to USB which shall have capability to communicate with optional accessories (external flash drive, USB GSM/GPRS/CDMA/3G Modem).
- have Real Time Clock (RTC) powered by separate primary battery with minimum life 10 years.
- have the facility to get time set from the Base Computer Station (BCS) only. The date time setting facility from the keys of CMRI should be inhibitive.
- be powered by rechargeable battery.
- be provided with battery charger for automatic charging of CMRI battery.
- be a provision for auto power save which shall force the instrument in the power saving mode in case of no activity within 5 minute.
- The average capacity of a charged battery shall be sufficient to communicate with meters and base computer station for at least;
    i) Min 10 Hrs during Meter reading with different communication and
    ii) Min 14 Hrs in standby mode.

  Bidder should furnish the battery specification and the working currents of the instrument to justify the capability of instrument to perform on site as above.
- . The bidder shall provide necessary specification of the battery used in the CMRI so that same could be arranged from the open et at competitive rate. For the purpose the type, code and makes of the battery shall invariably be mentioned by the bidders. In case batteries are equipment specific/ proprietary then it shall be responsibility of the Meter/CMRI manufacture to provide the batteries on demand by the [UTILITY] even after the guarantee period is over within 15 days time against orders and also extend necessary assistance to replace the battery.
- Suitability of battery for the given space and capacity shall be mentioned in following table

SN	Make of battery	Type	size	Code	mAh, etc	Remark
1						
2						

- have battery low indication and automatic cut off to avoid further drain of the battery. The battery status should be indicated suitably on the LCD display itself, which clearly indicate the amount/percentage of charge available.
- be provided with Li-ion/Li Polymer rechargeable battery.
- have security of data downloaded from meter up to downloading to BCS. There should be no possibility / options to remove any meter data file by operator before downloading to PC.
- The CMRIs to be supplied with the meters shall bear /marked / mentioned with the “Order no. & date, Name of Meter manufacturer and guarantee period for ease in identification in field.
- be provided with two part flexible universal type optical cord to read the meters with optical port duly fitted with and without optical sensor cords
    i) The universal optical sensor suitable for all make meters terminating into a 9 pin D type male connector with a cable of min. 500 mm+10 mm length with electrical circuit.
    ii) CMRI cable should have matching 9 pin D type female connector of min. 1500 mm + 10mm length with electrical circuit.

- Unless otherwise modified in the specification, CMRI shall comply with the CBIP Technical report No.111 with latest amendments.
- Meet climatic requirement mentioned in specification of energy meter
- **Type Tests:** The CMRI shall conform following tests. For testing of CMRI Report No.111 shall be referred.
    - Free Fall Tests as per IS900 (Part-VII Section-4) 1979
    - Shock Test as per IS 9000 (Part-Vii Section-1) 1979.
    - Vibration test as per IS 9000 (paart-8) 1981
    - Tests of protection against penetration of dust and water as per IS:12063.
    - Dry Heat Test as per IS 9000 (Part-III).
    - Cold Test as per IS 9000 (Part-II Section III of 77)
    - Damp Heat Cyclic Test as per IS 9000 (Part V of 81).
    - Test for Electromagnetic compatibility (EMC) as per IS 1000-4-2 (1995).
    - Radio Interference Measurement as per Table-4 Clause-6 of CISPR 22.

j. The manufacturer shall provide the protocol and other information to interpret the transmitted billing data. The data storage inside the CMRI and communication of CMRI with the meter shall be encrypted so that there is no possibility of tampering with the downloaded data.

k. The details like Make and type of the SBM (spot billing machine) with which CMRI compatibility are to be shown during evaluation shall be mentioned.

l. CMRI shall have option to select Meter number/s to dump in BCS specifically. CMRI and BCS shall be made available by AMISP.

21.1 Readings to be downloaded with CMRI:

The CMRI duly loaded with meter reading software should support in down loading all-important data stored in meter whether specified or not required essentially for deriving billing parameters including MD parameters. The following minimum parameters should be downloaded by CMRI.

i. Sr. No. of meter
ii. Date & Time
iii. Instantaneous Phase current
iv. Instantaneous Neutral current
v. Instantaneous voltage
vi. Cumulative Active energy (KWh)
vii. Cumulative Apparent energy (KVAh)
viii. MD during the month (in KW & KVA)
ix. Instantaneous load in KW and KVA.
x. Instantaneous Power factor (sign of lag or lead)
xi. Cumulative active energy in KWh for the last 6 months.
xii. Cumulative apparent energy in KVAh for the last 6 months
xiii. Maximum demand in KW & KVA for the last 6 months up to three decimal.
xiv. Average PF of the last 6 months.
xv. TOD 1,2,---,6 Cum. KWh & KVAH register(Programmable) for the last 6 months.
xvi. TOD 1,2,---,6 MD register KW & KVA (Programmable) for the last 6 months.
xvii. Tamper information including cover open tamper.
xviii. Daily load profile/mid night energy data for last 45 days.
xix. Block load profile parameter (with integration period of 15 minutes) for 35 days.
xx. Power OFF – ON event. (The persistence time shall be 5 minutes for logging Occurrence and immediate for restoration).

Any other information whether specified or not shall be as per the IS:15959 with latest amendment.

The downloaded data along with date and time stamp of such reading shall remain on CMRI with

suitable encryption and it should not be possible to pre-program or manipulate the recorded data of the CMRI before downloading the same on computer. The Supplier shall supply Software (compatible with Windows 10 system and/or higher) and training, free of cost for the use of software at multiple data collection and at RMS Centres/CCNB/Billing Centres of the utility.

After successful downloading of meter data to CMRI, an indication on CMRI or meter or both for confirmation of successful data transfer shall be provided. During this period the energy recording should not be affected.

Necessary upgrades shall be possible in CMRI software and shall be supplied free of cost for downloading simultaneously the existing parameters and any parameters added in future specifications of meters.

It is the responsibility of the supplier to supply the CMRIs preloaded with Combined Meter Reading Software i.e. Meter Reading Software (complying to IS:15959) and Softwares of all other makes of meters installed at our base. Supplier shall also load their CMRI Meter Reading Software (complying to IS:15959) on the available CMRIs at Stores and at the field to make the available CMRI common for all makes/type of meters installed in the existing base.

The Supplier shall also provide Low Level Security Password to exchange among the eligible bidders/suppliers to read the meter through CMRI.

22. MAXIMUMDEMAND REGISTRATIONAND MD RESETS:

The Meter shall continuously monitor and calculate the maximum demand at the point of supply, during any consecutive15minutesduringthecalendar month. It shall store the maximum demand with date and time, when it occurred. The maximum demand shall automatically reset at 24.00 Hrs of the last date of each calendar month for which minimum 30years calendar shall be programmed by the manufacturer. Maximum demand of the month shall be in KW & KVA up to three decimal digits.

23. REAL TIME CLOCKAND BATTERY:

The MD integration cycle shall be on the basis of Real time clock of the meter. The maximum drift in real time clock of the meter shall not exceed ± 3 minutes per year and crystal should be temperature compensated for temperature range of 0oC to 50oC. A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The metering data stated above including integration etc shall be independent of battery. The minimum life of battery should be ten years. All specifications shall adhere to Technical specifications as per CBIP 325. All specifications shall adhere to IS specifications as per CBIP 325.

Time drift is defined in CBIP only not in IS. It should be as per Technical specifications.

24. CALIBRATION:

The meters should be software based factory calibrated and there shall not be any mechanicaladjustmentincalibrationafterfreezingtheparametersatworks. This is to ensure that the meter cannot be calibrated at site.

25. CONSTRUCTION:

Meter shall be designed and constructed to be capable of withstanding all severe stresses and vibration and dust environments likely to been countered in actual field conditions. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.

26. TERMINALS, TERMINAL BLOCK AND COVER:

26.1 The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block should be made from best quality non-hygroscopic, flame retardant material (capable of passing the flammability tests given in IS:11731) with nickel plated

brass or equivalent or better material for connecting terminals. It shall be an integral part of the meter base.

26.2 Terminal holes inner diameter shall be of minimum 5.5mm with extended terminal block which form extension of the terminal holes to accommodate the insulation of conductor and terminal inserts shall be of adequate length in order to have proper grip of conductor with cage clamp or barrel type arrangement with the help of two screws such that there is no risk of loosening or undue heating. Each screw shall engage at least 3 threads in the terminal. Electrical connection shall be so designed that contact pressure is not transmitted through insulating material. It should be possible to directly insert the solid or stranded wire into the terminals.

26.3 Sufficient clearance shall be allowed between terminals. Further, the supporting webs between the two terminals of the terminal block should be sufficiently high to ensure that the two neighboring terminals do not get bridged by dust or it is not possible to have flashed over between adjacent terminals of terminal block.

26.4 The terminals shall be of suitable rating to carry 200% of Imax and shall be made of electro-plated (or tinned) brass.

26.5 All connection screws and washers should be tinned/ nickel-plated brass/ Zinc plated steel. The terminal screws shall not have pointed end at the bottom. All terminals shall have two screws. The terminals shall be properly bound in the insulating material of terminal block. Live connection screw are brass-Ni plated without washer and having flat bottom end.

26.6 The terminal block shall have provision with single/two/ threescrews for fixing to the meter board. It shall not be possible to remove the meter from the hanging screw without removing the screws from the terminal block. It should be fulfill purpose/requirement of TS and necessary approval should be taken by bidder for specific design from competent authority

26.7 The voltage circuit and current circuit shall be solidly connected inside the meter body without any link. A firm connection shall be established within the meter case to energize the voltage/current circuit. The connections shall be as per the recommended methods given in IS-13779.

26.8 TERMINAL BLOCK COVER:- The terminal block cover for the energy meters shall be provided transparent type having hinge, which can be sealed independently of the meter cover. The Extended Terminal Block Cover (ETBC) shall have a clear space of at least 25 mm, thus allowing sufficient clearance space for inserting cables. The terminals, their fixing screws and the insulated compartment housing them with meter fixing arrangement on the base of meter box shall be enclosed by extended terminal cover in such a way that no part of meter or accessories at terminal block shall be accessible from the front of the meter. There shall be provision of fixing of seals so that screws cannot be loosened without breaking the seals. The terminals shall not be accessible without removing the seal(s) of terminal cover when energy meter is mounted on the meter board / box. Necessary approval should be taken by bidder for specific design from competent authority.

27. CURRENTAND VOLTAGE CIRCUITS:

The cross section of current circuit shall be designed to withstand the temperature rise of 50^{o}C over the ambient temperature at maximum current. PT less design shall be used for power supply to PCB. The meter design shall be based on CT or CT and shunt combination or shunts. It is necessary to ensure accurate recording by the meters during the condition when DC component exists in the load, EM CT/Shunt currents should be compared and higher of the two should be used for measurement. Specific confirmation shall be submitted by the bidders that accuracy of measurement will not suffer due to utilization of shunt on account of thermal variation and

temperature coefficient up to an operational temperature of 80°C.

28. CT/Shunt Fixing arrangement:- The CTs/Shunts & other measurement devices when provided in the meter shall be mounted through proper fixing arrangement so that it should have a firm support and should not move from its position in any case.

29. METER FIXING ARRANGEMENT:

Every meter shall have at least two fixing holes one at the top and one at the bottom. The top hole shall be provided with a special clip at the back of the meter so that holding screw is not accessible after the fixing of the meters. The lower fixing screws shall be provided on/with the terminal block under the terminal cover. It should be fulfill purpose/requirement of TS and necessary approval should be taken by bidder for specific design from competent authority.

30. CONNECTION DIAGRAM&TERMINAL MARKINGS:

The connection diagram of the meter shall be clearly shown on the nameplate of meter and shall be of permanent nature. The meter terminals shall also be marked and this marking should appear in the above diagram. The connection diagram must be available on the terminal cover.

31. TERMINALARRANGEMENT:

Connecting terminals of the meter shall be in the following sequence:

Phase(in) Neutral (in), Neutral (out), Phase (out)

32. NON FLAMMABILITY:

The terminal block, and the meter case shall be such as to ensure reasonable safety against spread of fire. It shall not be ignited by thermic over load of live parts in contact with them. To comply with this requirement, all the parts shall fulfil the conditions of the glow wire test as per relevant standard.

33. SEALINGARRANGEMENT:

33.1 The meters should be software calibrated at factory and sealed suitably before dispatch.

33.2 At-least two sealing screws of Nickel plated steel / brass shall be provided for proper fixing of meter body (cover & base). Each sealing screw shall have two independent sealing holes. One hole should be provided in the head and one in the bottom portion. The diameter of the hole shall be 2.0 mm & 1.5 mm for the head and thread portion respectively. The sealing screw shall be tighten from the bottom of the extended flange on the meter body cover & base. The sealing screws shall be provided with patented lash wire tamper proof polycarbonate seals by the meter manufactures with additionally laser marked sr. no. matching with the meter sr. no., company logo and high rise logo of [UTILITY]. All the seals should be provided on front side only. Access to the working part should not be possible without breaking the seals.

However encapsulated meter design having single mould shall be preferred i.e. in one part only, a single integrated base & cover so that access to the internal part should not be possible without breaking the meter case. Such meters shall be provided with 02 nos. sealing holes. 01 no. hole shall be sealed by the manufacturer at its works with Polycarbonate seal and another shall be sealed by the utility after testing.

The meter shall be encapsulated / chemical welding with break to open type designed or base and top cover separated, may have option to provide one single sealing hole with one sealing screw only. In case of encapsulated design, if there is no sealing provision the same shall be accepted. The meter shall be encapsulated/ chemical welding with break to open type designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design.

Necessary approval should be taken by bidder for specific design from competent authority.

33.3 The serial number of meter is to be indelibly engraved/ marked/ laser –etched on the base as well as the cover of the meter box, and can be easily viewed to check duplication attempts for the purpose of keeping track of meter seals with serial no. matching with that of meter.

33.4 Meter cover shall be permanently and solidly welded with Base so that it could not be opened without breaking. In case of encapsulated design chemical welding is accepted

33.5 The provision shall also be made to provide additional lash wire seals on the meter body by the [UTILITY].

34. ADDITIONAL SEALS:

The bidder shall be required to supply 5nos.lash wire polycarbonate seals free of cost with each Single phase meters, as per specification appended herewith in Annexure-IV (C). The series of seal numbers shall be provided by the [UTILITY] in the event of placement of order. The bidders are required to submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals with the sample meters (Seals shall be provided at the time of technical demonstration and not at the time of bid submission. The final seal design and specification shall be changed/updated after issuance of the LoA, as per Discom's approval.) for evaluation by the committee as per technical specifications given in Annexure-IV (C).

35. TAMPERAND FRAUDPROTECTION:

Logics for design of various tampers, the value of voltage, current, time etc. to be selected for design of tamper shall be submitted to the purchaser for approval and record. If required bidder has to modify logic if necessary (The last tamper date and time of occurrence and tamper counts must appear in the DISPLAY and rest of the details in VIEW PARAMETERS). The persistence time for logging the tamper shall be 5 minutes for occurrence as well for restoration except separately defined like for magnet persistence time shall be 30 seconds for both occurrence and restoration and in case of cover open tamper persistence time shall be immediate.

The meter shall record and store last 100 events of tampers (occurrence + restoration) along with date and time of occurrence and restoration of each and every event. The event recording shall be compartment wise and roll over type i.e. it shall always maintain record of last 100 events occurred of selected tampers for logging.

The meter should have tamper & fraud protection features and shall record selected tamper information with date & time stamp. The meter shall continue to register active energy accurately even under following conditions:

35.1 The meter should register energy consumption correctly in forward direction irrespective of the direction of current in the current circuit (i.e. input and output interchange, phase and neutral connections interchange etc.).

35.2 **Load Earthing**:

(i) The meter shall record correctly when earth is used as a return path for load fully or **partially even when phase and neutral connection are reversed**

(ii) When incoming neutral is disconnected, outgoing neutral is connected to earth through resistance and load is connected to earth, the arrangement should be provided such that power LED/ICON starts blinking when incoming voltage is below 200 Volts. The energy register shall advance for low voltage up to 120 Volts.

(iii) Earth tamper should be logged with date and time of occurrence & restoration.

35.3 **Neutral Missing/Disturbance**:

(a) In the event of disconnection of neutral from incoming & outgoing side -

The single-phase meter should register energy even if both the incoming and outgoing neutrals are disconnected and load is drawn through local earth. This should be irrespective of the position of phase. The threshold current for this feature should be greater than 20% of Ib and the assumption should be rated voltage, rated frequency and Unity power factor in proportion to the current drawn, as per class of accuracy of meter. Meter shall have provision to record the tamper of Neutral Missing/disturbance with date and time of occurrence and restoration. Meter

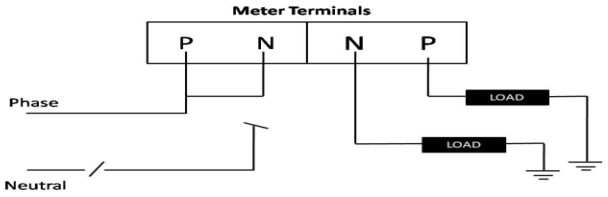
should display the readings under such condition.

The meter shall record energy proportional to the current and rated voltage with Unity pf when any of the enclosed tamper circuits are used to tamper energy by more than 10% using a diode in both polarity, or a variable resistance or a variable capacitance. The meter will be tested in these conditions such that the measured terminal voltage is reduced by 10%, 20% and 30% of rated voltage. The meter accuracy at 0.25 lag and 0.5 lead power factor shall be verified immediately after this test. The voltage threshold below which the recording should start at Vref , UPF and actual load is 90% of 240 volts i.e. 216 volts; meter shall record Neutral disturbance tamper. The testing shall be done as specified.

The meters shall work properly even if neutral is not available and shall work satisfactorily even if any two of potential wires are extended to it. The meter shall work properly in the absence of both incoming and outgoing neutral. Meter should be immune to the neutral missing & the recording should not be get affected in absence of both incoming & outgoing neutral.

Load switch should not be opened in both condition & meter should be recorded energy as per TS condition . In actual field conditions, there are cases where the meter has to work under single wire condition. Event shall be recorded. It shall work on single wire condition and event shall be recorded in the meter with date and time..

(b) The single-phase meter should register energy even if the incoming phase and neutral terminal of meter are connected/joined together and the load is connected on both phase and neutral or either of the two element of the meter separately and is being run through earth, then the meter should record energy as per actual current drawn (sum of the currents). The threshold current for this feature should not exceed 20% of Ib and the assumption should be rated voltage, rated frequency and Unity power factor in proportion to the current drawn, as per class of accuracy of meter. Same should also be logged as event with date & time as neutral missing/disturbance tamper. Detailed circuit diagram is as under:-



Load switch should not be opened in both condition & meter should be recorded energy as per TS condition. Event shall be recorded.

35.4 **Cover opening** :

If attempt is made to open the meter body, the meter shall detect /log with date and time of meter body opening tamper, even in absence of supply. This tamper shall also be displayed on the meter LCD in auto scroll mode. The auto scroll mode shall be locked with display of this tamper and push button mode shall work normal on pressing the push button.

In case of encapsulated meter design where base and cover are one part, cover open tamper shall be logged whenever meter terminal block is separated/removed/ misalign from the enclosure

35.5 **DC Immunity**:

The meter should not saturate on passing of direct current which can cause the meter either to stop recording or record inaccurately as per IS: 13779 (latest version).

35.6 **External Magnetic Influence**:

The meter shall either remain immune to tamper through application of external magnetic field (AC electro magnet or DC magnet) as per value specified in CBIP 325 or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F. as per CBIP 325 and same should also be logged as event with date & time.

Also In case of abnormal permanent magnetic field, meter shall either remain immune or if the metering gets affected then meter shall record energy at Imax, rated voltage and unity P.F and same should also be logged as event with date & time.

The meter shall be provided with built in logic/ indication and sensor to detect tamper beyond meter's magnetic immunity level and display of such occurrences. The meter accuracy or display accuracy shall not be affected by permanent magnetic field up to meter's magnetic immunity level.

At the time of occurrence of magnetic tamper, meter should record tamper event with Imax, rated voltage and unity P.F and at the time of restoration it should logged with actual parameters.

35.7 **Application of abnormal voltage /frequency**:

A) The accuracy of the meter should not be affected with the application of abnormal

voltage/frequency such as spark discharge of approximately 35 KV in any of the following

manner for 10 minutes:

i) On any of the phases or neutral terminals

ii) On any connecting wires of the meter

iii) Voltage discharge with 0-10 mm spark gap

iv) At any place in load circuit

v) Spark on meter body.

Remark: Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and meter should be immune in both condition.

Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and for conformance criteria of energy meter with 35 KV spark device/jammer test guideline as per CBIP-325 appendix-J should be followed".

B) Meter should also be immune for tamper by application of remote induction device (Jammer) when meter with communication module is placed inside of meter box and when meter without communication module is placed outside of meter box.

For the test methodology and conformance criteria of energy meter with 35 KV spark device/jammer test guideline as per CBIP-325 appendix-J should be followed.

If OBIS code is not available in IS: 15959 manufacturer specific OBIS code shall be acceptable.

Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and for conformance criteria of energy meter with 35 KV spark device/jammer test guideline as per CBIP-325 appendix-J should be followed.

35.8 **EMC/EMI Test**:

The meter shall also pass all EMC/EMI tests as per IS:16444 with latest amendments.

35.9 Further the bidder shall carefully note and confirm that:

1. The measurement of meter shall not be influenced by injection of AC voltages / chopped signal/DC signal and harmonics on the outgoing leads of the meter. In 3 ph meter also AC voltage/chopped signal/DC signal can be injected through Out going leads (load side).

2. The meter shall not get affected by any remote device.; As per Ts (Jammer test/35 KV spark may be performed in two condition 1. when NIC card is placed in meter and meter is mounted inside of meter box as per actual field condition 2.On the meter without NIC card and meter is outside of meter box). Remote device means any electrical or electronic or electromechanical or any other equipment

3. The bidder should furnish detailed explanation as to how the meter is able to detect/Protect recording the above tamper and fraud features with sketches and phaser Diagram. Additional features, if any, in the meter may also be clearly indicated.

Along with the tamper information, the meter shall also record the instantaneous values of voltages, currents and power factors to simulate and elaborate the existing condition during the tamper events.

36. LED INDICATIONS :

The following LED indications must be provided on single and Three phase indication:

(i) KWh indicator for Meter calibration - Red (Calibration LED-Imp/KWh)

(ii) Input and output reversal reversal accepted -Yellow LED indicator or ICON on Indication / current LCD; any indication of current reversal shall be

Neutral disturbance event to be record in case of Earth Tamper condition in Three phase meter specifications.

(iv) Power supply ON and Phase indication - LED or ICON on LCD for line 1, 2 & 3 or information on LCD like backlight on, value of supply voltage etc.

All the LEDs shall be of low power consumption and distinctly visible from distance. Except KWh indicator, all the other indications may be provided as Icon on backlit LCD.

37. SALIENTFEATURES:

The meter shall have the following additional features.

37.1 The meter shall be compact in design. The entire design and construction shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation/loading/unloading etc. The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.

37.2 The short time over current rating shall be 30 Imax for one half cycle at rated frequency as per clause No.9.2.3 of IS:13779.

37.3 The meters shall remain within ±1% accuracy when tested at basic current at rated voltage at 0.25 lag and 0.5 lead power factor.

37.4 Meter shall work within accuracy up to max. loading up to 120%I_{max}.

37.5 Even if phase to phase voltage (i.e. 440 Volts) is applied for 5 minutes between phase and neutral of the meter, the meter should not get damaged and continue to record correctly within class 1.0 accuracy after restoration of normal supply.

37.6 The meter shall also withstand impulse Voltage without any damage in accordance with the clause 12.7.6.2 of IS: 13779:1999.

37.7 The meter shall make use of Non Volatile Memory capable of storing & retaining all the data required to be stored, without the help of any power source or battery back up.

37.8 Computation of demand shall be on the basis of Real Time Clock of the meter itself.

37.9 Provision shall be there to do the billing operation automatically at a predefined date by programming the meter.

37.10 Meters covered under this specification shall be fully static type with non-volatile memory to register various billing parameters and complete with other features as detailed out in this specification. Any other design meeting technical specification or features/accuracy etc., better than this specification and manufactured as per relevant IEC/IS shall also be acceptable.

~~37.11 Meter shall be suitable for accurate measurement and display of energy and other billing parameters within the specified limits of errors under balance and unbalanced load conditions in a poly phase network.~~

37.12 Indication shall be provided on display to show the healthiness of phase voltage. Indication on LCD or separate LED shall be provided.
The meter shall have min 7 digits with '-' indication. Without indication indicates '+'. , parameter identifier, backlit Liquid Crystal Display (LCD) of minimum 10 mm height, wide viewing angle.

37.13 The meter shall be full programmable by the user for TOD timings and billing dates etc. For security reasons, the meter operating software should have at least “two level write protection” against any modification/editing of the parameters, data, setting etc. except those required for Billing data, TOD metering & meter shall be as per IS15959 part 2

37.14 The meter shall conform to the degree of protection IP51 of IS: 12063/IEC: 529 for protection against ingress of dust, moisture and vermin’s.

37.15 The meter base & meter cover shall be made of high grade, fire-resistant, non-inflammable high-grade and good quality engineering plastic.

37.16 The entire design and construction shall be capable of withstanding stresses likely to occur in actual service and rough handling transportation. The meter shall be convenient to transport and immune to shock and vibrations during transportation and handling.

37.17 The voltage circuit and current circuit shall be solidly connected inside the meter body without any link. A firm connection shall be established within the meter case to energize the voltage/current circuit. The connections shall be as per the recommended methods given in IS-16444

37.18 The bidder should specify the make & origin of components used in samples and should supply meters with same components in the event of order. If purchaser observes any change in make of components from the sample or approved list of components then the lot will be rejected.

37.19 The meter should not saturate up to 900% Ib if applied for 30 minutes and should record energy accurately (with in class 1.0 limits) for power factor range zero lag-unity-zero lead. The test shall be conducted on the meter applying Vref, 900% Ib, UPF for 30 minutes and accuracy shall be checked after 30 minutes to observe the meter performance.

37.20 Meter body (cover & base) and meter box material should be strictly as per the technical specification requirement. [UTILITY] at its discretion may arrange the testing of material from any supplied lot during the supplies from any NABL Accredited lab, if required.

38. SELF DIAGNOSTIC FEATURE

These parameters are desired to check the meter healthiness. OBIS code may be finalised in consultation with Discom. This is additional requirement which is to be provisioned in the meter.

The meter shall be capable of performing complete self-diagnostic check and continuously monitor all the circuits for any malfunctioning and ensure integrity of data memory location at all time. The meter shall have display indication for unsatisfactory/nonfunctioning/malfunctioning of the following:

a) Time and date on meter display

b) All display segments on meter display

c) Real Time Clock (RTC) status in meter reading print out at BCS end/HES and MDM

d) Non-volatile Memory (NVM) status in meter reading prints out at BCS end/HES and MDM end.

The OBIS code for the Self diagnostic feature shall be as under:-

OBIS Code for Self-diagnostic shall be 1 0 96 5 0 255 of one-byte length. The bit position shall be as per the table given below:-

S. No.	Parameter	BIT Position (through LSB)
1	RTC Status	BIT 0
2	NVM Status	BIT 1
3	Primary Battery	BIT 2

Note:- Bit shall be set to “0” for OK and set to “1” for not OK.

39. ELECTROMAGNETIC COMPATIBILITY AND INTERFERENCE REQUIREMENT:

39.1 The meter shall meet EMI/EMC requirements as specified in the relevant standards and shall also be protected against radiated interference from either magnetic or radio frequency sources.

39.2 The offered whole current meter shall also withstand DC Immunity test for main and neutral circuit at Iref = Imax/ root 2 as per IS:16444 so as to ensure that the meter current circuits do not saturate on passing of direct current.

39.3 The meter shall be designed in such a way that the conducted or radiated electromagnetic disturbances as well as electrostatic discharge do not damage or influence the meter.

39.4 The disturbance(s) to be considered are:

(i) Harmonics
(ii) Voltage dips and short interruptions
(iii) Fast transient burst test
(iv) External D.C. and A.C. magnetic fields
(v) Electromagnetic H.F. fields
(vi) Electrostatic discharges
(vii) Radio frequency interference suppression.

40. 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(s) in addition to the details as asked for, the same may be furnished against the last item of that Section.

41. NAME PLATE AND MARKING:

Every meter shall have a name plate clearly visible and indelible and distinctly marked in accordance with IS:13779/16444 (latest version). The following information should appear on the name plate affixed on to the meter:-

(i) Manufacturer’s name or trade-mark and place of manufacture.
(ii) Designation of type
(iii) Number of phases and number of wires for which the meter is suitable.
(iv) Guarantee period – Contract Period
(v) Purchase Order No. & Date.
(vi) Property of [UTILITY].
(vii) Bar coding of SN, Month & Year of manufacture
(viii) Sign of Insulation Class
(ix) Connection diagram
(x) Serial number, year and month of manufacture (MM/YYYY)
(xi) Principal unit in which the meter records Reference voltage
(xii) Basic current and rated maximum current (current rating)

(xiii) Reference frequency in Hz
(xiv) Meter constant (Imp/KWh)
(xv) Accuracy class
(xvi) Reference temperature
(xvii) ISI mark and license number
(xviii) Firm ware version for meter

42. TESTS:

(A) Type Test:

The type test certificate for all tests as indicated in IS:16444 (with latest amendments), CBIP Report 325 and DLMS Conformance test report as per IS:15959 shall be furnished along with the bid. Type test certificates from any one of the standard laboratories NABL accredited for particular equipment/test shall only be considered. Type test report, amongst other details, should contain the following information clearly:

(i) Type of meter and display
(ii) Class of Accuracy.

Type test certificate from educational institute(s) will not be accepted. The type test certificate shall not be more than 5 years old as on the date of opening of bid. the certificate must be for the exact model offered without any changes.

The Smart meter (WAN /NAN) should be type tested at any NABL accredited Laboratory in accordance with IS 16444 with latest amendments and our tender specifications, CBIP Report 325 and IS15959 with latest amendments. The Type test report certificate should not be more than 5 years old as on date of opening of bid.

(B) Additional Type Test: In addition to the tests mentioned at (A) above, bidder shall have to furnish the type test reports of compliance of anti-tamper features as per tender specification of at least one make of meter.

(C) Acceptance tests: All Acceptance tests as per relevant ISS and laid down in this tender specification shall be carried out.

(D) Verification during pre-dispatch inspection:

Inspecting officer shall verify that no DC supply/ signal is given to reference meter during the DC injection test. The accuracy of display parameters shall be verified at the time of inspection in line with class of accuracy of meter.

i. Voltage variation test
ii. Accuracy tests under all anti tamper conditions.
iii. Permanent magnet test
iv. Special accuracy test – the meters shall remain within ±1% accuracy when tested at basic current at rated voltage at 0.3lag and 0.5 lead power factor.
v. The accuracy of the meter, Real time clock disturb, Memory data corruption, meter functioning hang up etc. should not occur with the application of abnormal voltage/ frequency:

A) The accuracy of the meter should not be affected with the application of abnormal voltage/frequency such as spark discharge of approximately 35KV in any of the following manner for 10 minutes:

i) On any of the phases or neutral terminals
ii) On any connecting wires of the meter
iii) Voltage discharge with 0-10 mm spark gap
iv) At any place in load circuit

v) Spark on meter body.

Remark: Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and meter should be immune in both condition.

vi. Also Immunity from remote loop induction device (jammer)

The accuracy and above indicated parameters of meter shall be checked before and after the application of above device(s) with site conditions.

Meter should also be immune for tamper by application of remote induction device (Jammer) when meter with communication module is placed inside of meter box and when meter without communication module is placed outside of meter box.

vii. During the inspection / acceptance test at the place of supplier / manufacturer, all the major components (with make) used in the offered meters shall be verified as per approved list / sample and listed by the inspecting officer of [UTILITY]. The invoices of the components shall also be verified. Similar practice shall be adopted for component verification after receipt of lot(s) at the bidders stores at meter testing lab on random sample by the Committee, if required so by [UTILITY] for confirmation that the supplied meter is of similar design or not. During PDI acceptance test and other test as per TS requirement will be carried out as per relevant IS. However routine test of each meter is to be carried out by the meter manufacturer.

(E) Routine Tests:

All the routine tests as stipulated in IS:13779/16444 and in addition tamper and fraud protection tests as per TS shall be carried out and test certificates shall be furnished for approval of the Purchaser.

43. TEST FACILITIES AVAILABLE WITH THE MANUFACTURER:

The tests shall be carried out as per relevant Standards and test certificates shall be furnished for approval. The Supplier 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 materials.

Bidders should carefully note that the standard meters used for conducting tests shall be calibrated periodically at NABL Accredited Test Laboratories and test certificates shall be available at Works for verification by Purchaser's representative.

The Supplier/Manufacturer shall have at least the following testing facilities to ensure accurate calibration:

(i) Insulation resistance measurement
(ii) Running at no load
(iii) Starting current test
(iv) Limits of error
(v) Power loss in voltage and current circuit
(vi) Repeatability of error
(vii) Transportation test
(viii) Low load run test
(ix) Heating test

44. INSPECTION:

44.1 The Purchaser's authorized representative may carry out the inspection at any stage of manufacture. The Supplier/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 absolve 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.

44.2 All acceptance tests and inspection shall be made at the place of Supplier/Manufacturer. The Supplier shall provide all reasonable facilities without demanding any charge to the inspector representing the Purchaser to satisfy him that the equipment is being furnished in accordance with this specification.

44.3 The Supplier/Manufacturer shall keep the Purchaser informed in advance, about the manufacturing/readiness activities so that arrangement can be made for inspection.

44.4 The Purchaser reserves the right to insist for witnessing the acceptance/routine testing of the bought out items. The Supplier shall give 15 days advance intimation to enable the Purchaser to depute his representative for witnessing the acceptance and routine tests.

44.5 The Purchaser reserves the right to get type tests done in respect of any meter, or Box from any of the lots received at any bidders Stores at Supplier's expenses.

45. SAMPLE:

Sample before Commencement of supplies:

The Supplier shall submit sample of offered meter along with the meter box having all the features conforming to the prescribed specification for our approval before commencement of supply.

46. RANDOM SAMPLE TESTING AFTER RECEIPT OF METERS AT STORES:

The consignment of meters received at Bidders Store shall be accepted only after testing of sample meters at CPRI/any NABL accredited testing laboratory the testing charges shall be borne by the bidder. Purchaser may select meters at random from a lot of meters supplied and sent to CPRI/ERTL/any NABL accredited testing laboratory for acceptance test as per relevant ISS.

The sample meters shall be selected randomly from the lot and will be sent to CPRI for acceptance test as per relevant ISS and as per procedure prescribed in schedule-IV (D) and DLMS Compliance shall also be verified from the lab. If the sample fails in the above tests, then the entire lot will be rejected.

47. QUALITY ASSURANCE PLAN:

47.1 The designed life of the meter shall be minimum of 10 years and to prove the designed life, the firm shall have to follow at least the following Quality Assurance Plan:-

(i) The factory shall be completely dust proof.

(ii) The testing rooms shall be temperature and humidity controlled as per relevant standards. The testing and calibrating equipments should be automatic and all test equipment shall have their valid calibration certificates.

(iii) Power supplies used in testing equipment shall be distortion free with sinusoidal, wave forms and maintaining constant voltage, current and frequency as per the relevant standards.

(iv) During the manufacturing of the meters the following checks shall be carried out.

(a) Meter frame dimensions.

(b) The assembly of parts shall be done with the help of jigs and fixtures so that human errors are eliminated.

(c) The meters shall be batch tested on automatic, computerized test bench and the results shall be printed directly without any possibility of human errors.

47.2 The Supplier/Manufacturer shall furnish the following information. Information shall be separately given for individual type of meters offered.

(i) 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 material in presence of Supplier's representative and copies of test certificates.

(ii) Information and copies of test certificates as in (i) above in respect of bought out accessories.

(iii) List of manufacturing facilities available.

(iv) Level of automation achieved and list of areas where manual processing exists.

(v) List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

(vi) List of testing equipments available with the Supplier 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.

47.3 The Supplier/Manufacturer's laboratory 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). The details of testing facilities available for conducting (a) The routine tests and (b) Acceptance tests shall be furnished in Schedule annexed with tender document.

48. MANUFACTURING ACTIVITIES:

(i) All the materials, electronics and electrical components, ICs used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.

(ii) The Manufacturer should use Application Specific Integrated Circuit ASIC or Micro controller for metering functions.

(iii) 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 shall be of high quality. Further, the Supplier should own or have assured access of the above mentioned facilities. The PCB material should be of glass epoxy FR-4 grade conforming to relevant standards.

(iv) All insulating materials used in the construction of meters shall be non-hygroscopic, non-aging and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.

(v) Quality should be ensured at the following stages

(a) At PCB manufacturing stage, each board shall be subjected to bare board testing.

(b) At insertion stage, all components should undergo testing for conforming to design parameters and orientation.

(c) Complete assembled and soldered PCB should undergo functional testing using test equipments (testing zig).

(d) Prior to final testing and calibration, all meters shall be subjected to accelerated ageing test to eliminate infant mortality.

1. The calibration of meters shall be done in-house.
2. The Supplier/Manufacturer should submit the list of all components used in the meter along with the offer.
3. A detailed list of bought-out items which are used in the manufacture of the meter should be furnished indicating the name of firms from whom these items are procured. The Supplier shall also give the details of quality assurance procedures followed by him in respect of the bought-out items.
4. The details of testing facilities available for conducting the routine and acceptance tests and other special tests on the meter shall be furnished with the bid. The facility available if any for conducting type test may also be furnished.

49. DOCUMENTATION:

49.1 All drawings shall conform to International Standards Organization (ISO "A" series of drawing sheet/India Standards Specifications IS: 656. All drawings shall be in ink and suitable for micro filming. All dimensions and data shall be in S.I. Units.

49.2 List of drawings and documents:

The Supplier/Manufacturer shall furnish the following:

(i) Two sets of drawing clearly indicating the general arrangements, fitting details, electrical connections etc.

(ii) Technical leaflets (user's manual) giving operating instructions.

(iii) Three copies of dimensional drawings of the quoted item.

49.3 The manufacturing of the equipment shall be strictly in accordance with the approved drawings and no deviation shall be permitted without the written approval of the Purchaser. All manufacturing and fabrication works in connection with the equipment prior to the approval of the drawing shall be at the Supplier's risk.

49.4 Approval of drawings by Purchaser shall not absolve the Supplier of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirements of the latest revision of application standards, rules and codes of practices. The equipment shall conform in all respect to high standards of engineering, design, workmanship and latest revisions of relevant standards at the time of ordering and Purchaser shall have the power to reject the materials which, in his judgment, is not fully in accordance therewith.

49.5 The successful Supplier shall, within 2 weeks of notification of award of Purchase Order, submit three sets of final versions of all the drawings as stipulated in the Purchase Order for Purchaser's approval. The Purchaser shall communicate his comments/ approval on the drawings to the Supplier within two weeks. The Supplier shall, if necessary, modify the drawings and resubmit three copies of the modified drawings for approval. The Supplier shall within two weeks, submit 10 prints and two good quality report copies of the approved drawings for Purchaser's use.

49.6 Sets of operating manuals/technical leaflets per 100 meters shall be supplied to each consignee in the first instance of supply. Additional copies of sets of operating manuals/technical leaflets in the numbers as may be desired by the purchaser shall have to be supplied to the consignee or field officers.

49.7 One set of routine test certificates shall accompany each dispatched consignment.

49.8 The acceptance test certificates in case of pre-dispatch inspection or routine test certificates in cases where inspection is waived shall be got approved by the Purchaser

50. GUARANTEE:

(i) The Meters and CMRIs are to be guaranteed for upto the Contract Period.

(ii) The meter found defective within the above guarantee period shall be replaced by the supplier free of cost within 30 days of the receipt of intimation. If the defective meters are not replaced within the above specified period, the same shall be treated as breach of performance of the Purchase Order and shall be liable for consequential penal action.

(iii) The replacement of Stop/ Defective meter at consumer premises shall be done by AMISP as per MPERC regulatory norms or as prescribed by the Utility.

51. PACKING & FORWARDING:

51.1 The equipment shall be packed in 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. Any material found short inside the packing cases shall be supplied immediately by Supplier without any extra cost.

51.2 Each consignment shall be accompanied with a detailed list containing the following information.

a) Name of the consignee

b) Details of consignment

c) Destination

d) Total Weight of Consignment

e) Handling and packing instruction

f) Bill of material indicating contents of each package

51.3 The packing shall be done as per the Manufacturer's standard practice. However, he should ensure the packing is such that the material should not get damaged during transit by Rail/Road.

52. GENERAL :

52.1 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, shall be furnished by the bidder.

52.2 The Supplier shall indicate the method adopted to transform the voltage and current to the desired low values with explanation on devices used such as CT, VT or potential divider as to how they can be considered superior in maintaining ratio and phase angle for variation of influencing quantities during its service period.

52.3 The Supplier shall furnish details of memory used in the meter.

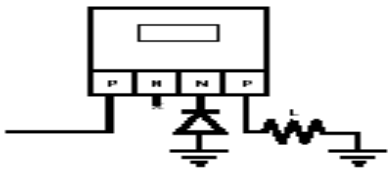
52.4 The Technical Specification of Hinge Type Meter Box Made of Engineering plastic/Polycarbonate has been described in Schedule-IV(B).

52.5 The procedure for Verification/Testing of Material supplied described in Revised Schedule-IV(D) shall be followed.

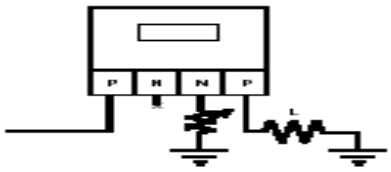
52.6 It is mandatory to conform compliance of guaranteed technical particular of ac single phase Static DLMS compliant smart energy meter with LCD display.

53. Tamper circuits

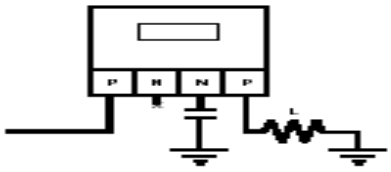
Tamper Circuit 1



Tamper Circuit 2



Tamper Circuit 3



Schedule-IV(B)

TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate)

1. The meter box shall be weather proof, tamper proof and made of transparent engineering plastic conforming to IS: 11731. Type test of material is required to be furnished along with the sample.

2. The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 degrees. centigrade.

3. Thickness of the base and cover should be at least 2 mm.

4. The overall dimensions of the box will be such that a minimum clearance of 10 mm shall be maintained from top and both sides of the meter. However, the clearance at bottom should be of 70 mm from the meter and 25 mm from the terminal block. in addition, there should be minimum clearance of 10 mm in the front from the face of meter.

5. The top cover of the meter box should be of Hinge type having at least 2 nos. U clamps to hold the cover with base with tamper proof sealing arrangement. The cover and base shall have groove all along with the fitting edge, so that after fixing the top cover, no wire or any device can be, temporary or permanently, inserted in the box.

6. Internal hinges: A minimum of 2 nos. internal hinges well protected against corrosion shall be provided on left side of the box. The hinges of the door shall be concealed and they shall be fixed to the flanges provided to the base and cover of the box in such a manner that the door opens by a minimum of 120 degrees. Further bidder may also provide General practice Book open type arrangement therefore internal hinges should provide accordingly

7. Meter shall be fitted with the base of box through screw or by some other better means in such a way so that once the meter is fitted with the base; it cannot be removed from the base and become an integral part with base. The meters shall be supplied duly mounted on the base of meter box.

8. Suitable circular holes with adjustable cable glands shall be provided at the bottom of the meter box for inlet and outlet of consumer's service cables. The incoming and outgoing gland shall be positioned such that they disable direct access to terminals through glands.

9. The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad can be accepted.

10. The boxes shall be specific to the meter mounted in it. Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.

11. The box should have proper mounting arrangement so that it could be mounted on the wall or the pole, as the case may be. LT CT meter boxes are to be mounted on wall or pole as per requirement (For consumer or DTR)

12. The meter box comprises of base and cover shall pass the following tests;

    i) **Unbreakability test**:-
    Shall not get damage or deform while dropping from a height of 10 ft. and hammered with 2 kg Hammer to test its unbreakability.

    ii) **Boiling water test** :-
    It should pass the boiling water test as prescribed in IS:13010.

13. The overall dimensions of the meter box shall vary according to the different make of meters. However, it shall comply with the minimum requirements as described above.

14. The individual meter manufacturers shall submit the specific drawing and sample accordingly to accommodate their make of meter only. In the event of order placement, the AMISP shall submit a Meter Box Sample as per technical specification (as engineering plastic) before the commencement of Supply for approval.

TECHNICAL SPECIFICATIONS OF LASH WIRE POLYCARBONATE METER SECURITY SEALS

1. Seals should be made of high quality polycarbonate material and it should not be effected by boiling water etc. The seal must be able to withstand harsh environment indirect sunlight exposure. The seal should withstand heat resistance test at least for two Hours at 147 degree Celsius.
2. The seal should be transparent clear. The seal should be of one- piece polycarbonate body consisting of capsule and locking anchor with integrated non- magnetic & non corrosive stainless steel sealing wire.
3. Manufacturer must patent the supplied seal; so that identical seal cannot be manufactured by other manufacturer and similar type of fictitious are not available to the counterfeiters.
4. Every seal should have 20 cm long non corrosive, non magnetic two strand stainless steel wire (0.40/0.25mm) permanently moulded to the seal body and locking cap of seal also moulded with steel wire.
5. The seal should have high rise molded Logo of **Discoms** copy of it is enclosed and Thermo engraved sequential unique alphanumeric 7 digit serial numbers on the main body and on the cap. The sequence serial nos, logo & color if any shall be intimated separately.
6. The serial nos. should be Thermo engraved or laser engraved and printed in highly visible contrast such a way that the same cannot be manipulated by using any tool or by any chemical reactions. This should be distinct and can be easy to read without using lens. The locking cap should be same serial no thermo engraved printed in highly visible contrast.
7. The sealing arrangement should be such that its original position cannot be restored after any effort of tamper or breaking of the seals.
8. The sealing mechanism should be such that it can be sealed without using any pliers or tools. The sealing procedure must be fool proof and there should not any scope of pre tampering / malpractice with sealing wire while sealing.
9. Packaging: The seal should be supplied in packet of 100 seals. Each packet shall be labeled for following information.
   . Logo details
   . Serial Number Range
   . Quantity
10. Samples: Supplier shall submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals as per TS & drawing (dimensional) for approval before commencement of supply.
11. Test: Seal should be tested for following plastic properties. Test certificate from NABL accredited lab
    1. Heat resistance at 147 degree Celsius.
    2. Breaking strength seal shall be able to withstand a force of at Least 12.0 Kg
    3. Salt spray test.
    4. Boiling water test.
12. The seal should have following essential features.
    i. Tamper resistance
    ii. Heat resistance
    iii. Environmentally safe
    iv. Should withstand direct sun light & rain water exposure
    v. Tamper evident: Material must show clear sign of tampering such as dis-colourisation when material is compromised by Penetration, Drilling, cutting, bending or pulling etc.
    vi. One end of the wire should be loose and other end of wire should be permanently fixed on the bottom of female body of seal.
    vii. Ultra violet ray resistant.

13. **Construction:** One piece construction comprising of polycarbonate capsule & anchor and integrally connected non corrosive & non magnetic 2 strand twisted stainless steel sealing wire.
Capsule : Contains and internal locking mechanism which accepts the anchor and permanently secure the sealing wire.

Anchor : The locking cap shall have double Anchors, which secures the loose end of the sealing wire into the capsule locking mechanism.

Wire : Passes through and secures the meter.

14. Marking (A) For [UTILITY],
Logo of Discom :

S.NO. From ---------- To ---------- to be provided on main body of seal and top cap.

Color: Clear transparent (Color Less)

On other side of main body: Respective discom

Note:- Seal patent certificate shall be produced by the firms to ascertain the seals provided on the meter and with the meters are patented. The patented seals shall have mark of the patent seal manufacturer also in addition to the marking as per the above requirement.

Schedule-IV(D)

VERIFICATION / TESTING OF METERS SUPPLIED

i) On receipt of first lot in bidders Store, three (3) sample meters shall be selected for conducting Type Test for each category of meter as per relevant IS by a committee constituted by discom. For whole current smart meter (single or three phase) one additional sample shall be selected by the committee for the testing of relay/ connect-disconnect as per relevant IS. The samples so selected shall be sealed by at least 3-4 seals/stickers by the committee members. The selected samples shall be sent with complete details for type test and additional test/special tests and DLMS conformance test as per specification at CPRI, Bhopal/any third party NABL accredited **test lab. The type test charges shall be borne and deposited by the supplier."** The detailed procedure is explained hereunder.

During the pendency of Type testing and DLMS conformance test of first lot at NABL Lab, the supplier shall provide all the application software, interfaces to the utility to enable the generation of bills using CMRI data from the respective Discom's billing units.

It is also binding on the bidders to provide other information & support and software customization also in addition to above, as may be required by purchaser to achieve auto billing and analysis of data as per the provision of technical specification requirement till satisfaction and acceptance by purchaser.

The random sample testing from subsequent lot(s) of individual DI shall be subject to acceptance test at CPRI//ERTL or any third party NABL accredited laboratory at the discretion of purchaser.

ii) In case of successful type test results, supplies shall be continued. However, in case the meter(s) do not meet the requirement as per ISS Specification in type test(s), three more samples shall be selected from the supplies already received to get them type tested at supplier's cost. In case of repeat failure in type test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled.

iii) On receipt of consignment of subsequent lot in AMISP' stores, a set of 32 meters shall be selected randomly and sent to CPRI/ERTL/any third party NABL accredited laboratory at the discretion of Discom for conducting acceptance test as per the prescribed procedure. The Cost shall be borne by the AMISP.

S. No	Particulars of tests	No. of samples to be tested
(i)	Starting Current test and No load test	32 Nos.
(ii)	AC high Voltage test, Insulation test, Limits of error, Test of meter constant, Power consumption test.	8 nos. out of above 32 Nos.
(iii)	Repeatability of error	3 nos. out of above 8 Nos.
(iv)	Voltage variation, Tamper & fraud protection, D.C. Immunity Test, Magnetic Immunity test (Permanent magnet test of 0.27 Tesla), Accuracy test after application of 440 Volts for 5 minutes, Imax for 30 minutes test, D.C. Injection test, Approx. 35 KV high voltage /high frequency burst test, remote loop induction device (jammer) test, Shock test and Fast transient burst test.	3 nos. out of above 8 Nos.

Following procedure shall be adopted to clear the tested lot:

1. Failure of any 2 nos. meters shall be allowed out of 32 nos. of meters tested at sr. no. (i) of above table. Failure of more than 2 nos. meters, the further testing shall be suspended and lot shall be declared as fail.
2. Failure of any one meter shall be allowed out of 8 nos. of meters tested at sr. no. (ii) of above table. In case of failure in more than one meter, the further testing shall be suspended and lot shall be declared as fail.
3. No failure shall be allowed out of 3 nos. of meters tested at sr. no. (iii) of above table. In case of failure of any meter, the further testing shall be suspended and lot shall be declared as fail.
4. Failure of any one meter shall be allowed out of 3 nos. of meters tested at sr. no. (iv) of above table. In case of failure in more than 1 no. meter, further testing shall be suspended and lot shall be declared as fail.

iv) In case of failure of samples of lot/ sub-lot in the test(s) detailed above, the similar testing procedure as described shall be repeated on another lot and if the lot fails consecutive second time the entire quantity of respective lot/sub-lot shall be rejected and shall have to be replaced by the supplier at his own cost. Repeated failure/poor results in the testing may render cancellation of order.

v) The supplies, at the option of Utility, may be utilized in the field during the period of testing. In case of repeat failure in Type/Acceptance Test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled. The Utility also reserves the right to accept or reject the utilised quantity in the field on the basis of the test results.

vi) The Utility also reserves the right to get additional samples for all or any of the selected tests at purchaser's cost at any independent test house at any stage of supply, if so considered necessary to ensure that the quality of meters being offered for inspection is same as already got type tested.

vii) However, the purchaser i.e. [UTILITY] may its option/ discretion may allow the supplier to re-offer the material after change/ modification in the design of meters. The balance material shall be accepted only after successful Type Testing. The Type Testing charges shall be borne by the supplier. The decision of [UTILITY] in this regard shall be final and binding on the supplier.

viii) In case of successful test results, supplies shall be continued.

ix) The decision of [UTILITY] regarding verification/ Testing of meters at CPRI or any other third party NABL accredited laboratory shall be final and binding on the supplier and the [UTILITY] shall not be required to give any reason(s) in writing or otherwise at any time for the rejection of material.

GUARANTEED TECHNICAL PARTICULAR OF LT SINGLE PHASE WHOLE CURRENT STATIC ENERGY METERS WITH OPTICAL COMMUNICATION PORT

(For Consumer Metering)

SINGLE PHASE 2 WIRES, 240 Volts 5-30 AMP, SMART ENERGY METER

Sl.No.	Particular	Purchasers Requirement	Offered
1.	Name of manufacturer	To be mentioned	
2.	Type, name & number (Model)	To be mentioned	
3.	Standard Applicable	IS 16444 with its latest amendment as on date.	
4.	Rating		
(i)	Accuracy Class	Class-1.0 as per IS 16444 for Active Energy	
(ii)	Rated Voltage	240V (+ 20% -40%)	
(iii)	Rated current	Ib-5/10 Amp. Imax 30/60 Amp, Variation 120 % of Imax	
(iv)	Rated frequency	50 Hz ± 5%	
(v)	Power factor	0 lag - Unity – 0 lead	
(vi)	Shall work within accuracy up to max. loading	120 % of Imax	
5.(i)	Continuous current rating (Amp.)	30/60 Amps.	
(ii)	Running with no load and 115 % of rated voltage	No creeping	
6.	Short time over current for one half cycle at rated frequency.	30 Imax	
7.	Starting current at which meter shall run & continue to run	Starting current at which meter shall run & continue to run - 0.4%of Ib at rated voltage and unity power factor & continue to run at 60 A	
8.	Power loss at rated frequency & reference temperature		
(a)	Current circuit at rated current	As per IS 16444	
(b)	Voltage circuit at rated current	As per Is 16444	
9.	Type of material used		
(a)	Base Material and thickness	Transparent/ opaque, High Impact strength, non-hygroscopic, flame retardant, Engineering plastic of min. 2.0 mm thick	
(b)	Meter cover material	---As above ---	
(c)	Terminal Block material	High Impact strength non hygroscopic, flame retardant material. Barrier of adequate size shall be provided between neighbouring terminals.	
(d)	Colour	Meter cover shall be fully transparent/Opaque	
(e)	Screw		
(i)	Material	Material of Screw is tinned/ nickel-plated brass/ Zinc plated steel	
(ii)	Size	5-6 mm dia	

Sl.No.	Particular	Purchasers Requirement	Offered
10.	Internal diameter of Terminal Hole	As per CBIP report 325	
	Note	**Meter Cover should be ultrasonically welded.** **The meter shall be encapsulated/** chemical welding with break to open type **designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design**	
11.	Centre to Centre clearances between adjacent terminals	More than 13 mm	
12.	Transducers		
(i)	Input	CT/Shunt or combination and potential divider (PT less)	
(ii)	Output	Digital	
13.	Type of display	LCD with Backlit	
(i)	Operation suitability	LCD suitable for operation up to $80^{o}C$	
(ii)	No. of Digits	6 including decimal digit (5+1)	
(iii)	Size of Numerals	SIZE OF NUMERALS 8.5 x 5 mm MIN	
14.	Display Sequence (display should be self explanatory)		
14.1	Auto Scroll Mode		
(i)	Cumulative active energy	KWh	
(ii)	Maximum demand of month	KW	
14.2	Push button mode	(As per specification)	
15	Type of push button arrangement	Spring loaded push button to be provided on top cover of meter box to activate the push button of meter to read parameters Spring loaded push button/ Capacitive Touch Keypad can be accepted.	
16.(i)	Reading during power-off condition	Meter shall be able to display the reading trough any push button mode in power off condition.	
(ii)	Type of arrangement made to display in power off condition	To be explained	
(iii)	During power outage if reading button pressed continuously for more than 1 minute	Display shall be inoperative and it will get operative with change of date / resumption of power.	
17.	Whether meter is provided with optical port for data downloading	To be indicated	
18.	Battery Backup	Meter shall be supplied with separate battery backup for RTC and for display in case of power failure. The battery shall have a guaranteed life of 10 years from date of installation of meters.	

Sl.No.	Particular	Purchasers Requirement	Offered
19.	Fixing/sealing arrangement		
(i)	Fixing of meter	Min. 2 fixing holes (one at top & one at bottom under terminal block). The top fixing screw shall not be accessible after meter is fixed to meter box base.	
(ii)	Sealing of meter cover to Base	(a) At least 2 nos. polycarbonate irreplaceable tamper evident seals with serial no. matching with that of meter also marked with discom name and firm's logo.	
		(b) seal shall be provided on front side only.	
		(c) Meter cover shall be permanently and solidly welded with Base so that it could not be opened without breaking. In case of encapsulated design chemical welding is accepted	
20.	Performance of meter in tamper conditions		
(i.)	Phase-neutral interchanged	Should work within specified accuracy	
(ii)	Main & load wire are interchanged	----do----	
(iii)	(a) Load is not terminated back to meter & current is drawn through local earth fully or partially even when phase and neutral connection are reversed.	---do----	
	(b) Incoming neutral disconnected, outgoing neutral connected to earth through resistance and load is connected to earth.	LED start blinking when incoming voltage is below 200V and Energy register shall advance for low voltage up to 120V for single phase meter. LCD icon shall also be accepted	
(iv)	Neutral disconnected from both incoming & outgoing and load drawn through local earth	Provision should be there to not exceeding threshold current of 20% of I_b and start recording energy.	
(v)	Indication in above tamper condition (LED or ICON)	"Reverse" indication for (i) & (ii), "Earthed" indication for (iii) above & (iv)	
(vi)	Injection of abnormal frequency and voltage of the order of 35 KV with help of external device. Meter should also be immune for tamper by application of remote induction device (Jammer) when meter with communication module is placed inside of meter box and when meter	Should work normal	

Sl.No.	Particular	Purchasers Requirement	Offered
	without communication module is placed outside of meter box.		
21.	Suitability of meter to sustain over voltage i.e. phase to phase voltage injected between phase & neutral	Should sustain	
22.	Size of calibration LED and other LED/Icon	Size of calibration LED and other LED/Icon: Low Power 3mm or 5mm. Calibration LED of Red colour is essential.	
23.	Electromagnetic compatibility (EMC/ EMI severity level)	Should withstand severity level 4	
24.	Effect on accuracy of external electromagnetic interference of electrical discharge, external magnetic field & DC current in AC supply or in neutral	Should work within accuracy Complying with standards with its latest amendment as on date.	
		The meter shall not get influenced by any external magnetic fields (AC Electromagnet or DC Magnet) as per value(s) specified in CBIP technical reports no 325 for AC magnetic field. • Under the influence of abnormal magnetic field (above prescribed limits) the meter shall record power value not exceeding the product of rated voltage and maximum current (I_{max}). • Meter shall have provision to record the tamper of abnormal magnetic induction with date and time of occurrence and restoration.	
25.	Effect of accuracy in tamper conditions	Should work within accuracy specified in IS:16444 with latest amendment	
26.	Cut off voltage (at which meter stop working)	Cut off voltage (at which meter stop working) shall be below 40% of the rated voltage (Vref)	
27.	Ref. Temperature	27^{o}C	
28.	Temperature range of operation	-10^{o}C to 60^{o}C	
29.	Drift in accuracy of measurement with time	No Drift in accuracy in measurement with time	
30.	Fixing arrangement of name plate	Plastic nameplate fixed in side the meter. It should contain all the details as per ISS	
31.	Type of body	Projection type	
32.	Calibration	Software calibrated at factory.	
33.	Manufacturing activity		
(i)	Mounting of components on PCB shall be SMT type	SMT type and ASIC technology	
(ii)	Compliance to quality assurance	To be complied	
34.	Testing facility		

Sl.No.	Particular	Purchasers Requirement	Offered
(i)	Fully automatic meter bench with print out facility shall be available.	Must be available	
(ii)	Make and S.No. of Test bench	To be indicated	
(iii)	Accuracy of ESS duly calibrated	---do---	
(v)	Following in house testing facility shall be available;		
a)	Insulation resistance	Must be available	
b)	Running on no load	--do--	
c)	Starting current	--do--	
d)	Limits of error	--do--	
e)	Power loss in voltage and current circuit.	--do--	
f)	Repeatability of error	--do--	
g)	Transportation test	--do--	
h)	Low load run test	--do--	
I)	Heating test	--do--	
35. (i)	Whether offered meter are Type Tested as per IS:16444 at NABL accredited Lab	To be indicated	
(ii)	Name of the Lab	To be indicated	
36.	Guarantee period of meter printed on name plate.	As per TS	
37	Parameters (In case of net-meter both export & import parameters to be measured)	Instantaneous: As per IS 15959 (Part 2): 2016 Billing parameters: As per IS 15959 (Part 2): 2016 Daily Load Profile: As per IS 15959 (Part 2): 2016 . The billing parameters shall be retained in the meter for 12 months and should automatically rollover. With additional parameters of export TODs, Profile parameters for meters (including Import - export parameters) shall be in line with IS16444 part1 requirements and import/export parameters shall be in line with the requirements of IS16444 part1 and IS15959 part2.	
38	Maximum Demand	Should have Maximum Demand registers kW and kVA with integration period 15 minutes. It should be programmable for 30/15 minutes. Resets should be auto-monthly as well as through HES. MD Recording should be based on sliding window principal with default MD integration Period 15 Min	

Sl.No.	Particular	Purchasers Requirement	Offered
39	Load Survey/Interval Data	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. By default, LS parameters shall be with 15 Min. integration period. In addition to that Instantaneous parameter (IP data) shall also be captured on every 15 min interval at HES level.	
40	Time of Use	As per IS 15959 (Part 2): 2016	
41	LCD Indicators	As per IS 16444:2015	
42	Tamper/Event recording	As per IS 15959 (Part-2):2016. 200 events shall be stored in local memory of Smart Meters (100 occurrence and 100 restoration)	
43	Alarm switch / contactor	As per IS 15884	
44	Measuring Elements	Meter should have two measuring elements – one in phase and other in neutral path.	
45	Anti-Tamper features	As per TS	
46	Disconnection/Reconnection Mechanism	As per IS 16444.	
47	Connect/Disconnect Indication	As per IS 16444	
48	Programmability	It should be possible to program the parameters limits / values remotely through adequate security mechanisms. Once programmed it will be possible for the programmed parameters to come into effect from a certain date & time. Metrology under such condition must remain intact and shall not be upgradable	

Sl.No.	Particular	Purchasers Requirement	Offered
		from remote & Meter shall be as per IS 15959 part 2	
49	Communication and Communication Protocol	As per IS 16444	
50	RTC & time synchronization	Meter shall have RTC with 20 years calendar programmed in the memory and provision for time synchronization, the maximum drift shall not exceed +/- 300 Seconds per year. The clock day/date setting and synchronization shall only be possible through password/Key code command from remote server through communication network. Contractor shall submit the methodology for the synchronization of RTC.	
50	Data display facility (manual/Auto)	Data Display shall have following features: Data display facility (manual/Auto) Minimum 7-digit LCD display having minimum 8.5x5 mm min for all digits Display of data as per TS. The Push button for manual scrolling in addition to auto scrolling with a persistence time of 10 seconds for each parameter shall be provided. High resolution (shall display energy value with resolution of 2 digits before decimal and 5 digits after decimal. KWh total and fundamental kWh are essential. In case of Net Metering Import, Export and Net will be available at Meter Display and at HES also In case of prepaid meter Display parameters should be available as per IS 15959 and latest amendment and same shall be available at HES also. With additional parameters of export TODs, the requirement shall be in line with IS16444 part 2 for import - export meter parameters.	
51	Guarantee	Manufacturer Shall undertake a guarantee to replace meter with NIC up to Contract Period (Execution + AMC). However meter	

Sl.No.	Particular	Purchasers Requirement	Offered
		with NIC is supplied after execution period then Guarantee period shall be 5 and half year from date of supply.	
52	Remote Firmware Upgrade	As per IS 15959 (Part 2): 2016	
53	Testing of Smart Meter	As per TS	
54	Other parameters/features not covered in the above GTP	Conform to specification of IS 16444 (with its latest amendment).	
55	Category	UC1	
56	Limits of error	As per IS 16444 Part 1	
57	Humidity	As per IS 13779	
58	Power Consumption of meter	As per IS 16444 Part 1	
59	Power Quality Information	As per IS 15959 part 2	
60	Load Control	As per IS 16444 Part 1	
61	Data Exchange Protocol	As per IS 16444 Part 1	
62	Data Retention	As per IS 16444 Part 1	
63	First Breath (power on) and Last gasp (power off) condition detection and communication to HES	As per IS 16444 Part 1	
64	Plug-in Communication Module	The Smart Meters (with same make) shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF/Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN).The Plug-In module shall be field swappable/ replaceable.	
65	Data Display Facility	As per IS 16444. However, minimum requirements should include the following: Data Display shall be in two modes- 1. Auto Scroll 2. Scroll with Push Button The display parameters shall be: Auto Scroll Mode: • Display Check • Date and Time	

Sl.No.	Particular	Purchasers Requirement	Offered
		• Last Recharge Amount • Last Recharge Time • Current Balance Amount • Current Balance Time • Cumulative Active Energy kWh with legend. • Current calendar month MD in kW with legend. • Instantaneous voltage • Instantaneous Phase current • Instantaneous Load kW • Instantaneous average Power Factor These parameters should be displayed on the Meter Display continuously for a period of 10 seconds on Auto scroll. Scroll with Push-button: • All Parameters mentioned under Auto-Scroll mode should be displayed. Additionally, the following Parameters shall also be displayed: • Internal diagnostics (display check) • Meter Serial No. • Last month cumulative kWh with legends • Last month MD in kW with legends • Current month Average Power Factor • Last month Average Power Factor • 2nd Last month cumulative kWh with legends • 2nd Last month MD in kW with data and time of Occurrence • 3rd Last month cumulative kWh with legends • 3rd Last month MD in kW with data and time of Occurrence	

Sl.No.	Particular	Purchasers Requirement	Offered
		Further, the Meter should display high resolution energy values with resolution of 3 digits before decimal and 2 digits after decimal in push button mode The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds. (The order of display may be revised as per requirement of the Utility). Meter display should not go in to sleep mode during Power-On condition in case the push button is not operated for more than 10 minutes	

REMARKS:

(1) All the information/parameters indicated above shall exist in the meter offered & shall withstand all the tests specified above within the variation of current/voltage frequency and climatic conditions specified therein.

(2) Even though if any features or parameters are not specifically covered in this GTP, but are essential for the satisfactory performance of the meter as per the specification, are deemed to have been covered in the GTP.

Annexure-B

ISI MARKED, DLMS COMPLIANT, CATEGORY-D2, LT STATIC WHOLE CURRENT 20-100 AMP or Better (10-100Amp) THREE PHASE 4 WIRE LCD DISPLAY METER WITH AMR COMPATIBILITY, CLASS 1.0s

Sl. No.	Test	Minimum requirement	As per firm's offer
1	Name of manufacturer		
2	Type, name & number		
3	Standard Applicable	IS:16444 CBIP report 325 with latest amendment & Indian companion specification IS:15959 with latest amendments	
4	Type of Meter (Model No.)		
5	Category	"D2"	
6	Rating		
	i) Accuracy class	Class-1.0	
	ii) Rated voltage	240V +20%_ -40%	
	iii) Rated Current		
	a) Whole current meter	Ib-20/10 Amp. Imax 100 Amp.	
	iv) Rated frequency	50 Hz +5%	
	v) Power factor	0 lag to Unity to zero lead	
	vi)Shall work within accuracy upto max. loading	i) up to 120 Amp loading	
7	i) Continuous current rating (Amp.)	100Amp	
	ii) Running with no load & +115% voltage	No creeping	
8	Short time over current for 10 milli seconds	30 Imax	
9	Starting current (minimum) at which meter shall run & continue to run	0.4% of Ib at rated voltage and unity p.f as per IS 16444	
10	Power loss at rated frequency & reference temperature		

Sl. No.	Test	Minimum requirement	As per firm's offer
	a) Current circuit at rated current per phase	As per IS 16444	
	b) Voltage circuit at rated	As per IS 16444	
11	Momentary over voltage	As per IS	
12	Dielectric voltage-withstand	As per IS	
13	Communication port	Communication port should be as per IS 16444. AMR through optical port/ GPRS is acceptable.	
14	Communication protocol standard	2 nos. galvanically isolated optical port i.e.,. 1 NO galvanically isolated optical port for load survey facility etc. Optical Port and NIC Module will be provided in meter Indian companion specification IS:15959 with latest amendments. Communication protocol standard-meter shall be galvanically isolated communication port as per IS16444 i.e. one galvanically isolated optical port for load survey facility etc. & another for WAN/NAN communication module.	
15	Type of communication	Meter should be compatible for reading through MRI	
16	Battery backup	Lithium battery with min. life of 10 yrs	
17	Type of material used		
	a) Base		
	i) Material	High Impact strength, flame retardant, UV stabilized polycarbonate	
	ii) Thickness	2.0 mm	
	b) Terminal Block		
	i) Material	As above	
	ii) Thickness	2.0 mm	
	c) Meter cover		
	i) Material	As above Transparent Polycarbonate	
	ii) Thickness	2.0 mm	
	d) Terminal cover		
	i) Material	As above Transparent Polycarbonate	

Sl. No.	Test	Minimum requirement	As per firm's offer
	ii) Thickness	2.0 mm	
	e) Screw		
	i) Material	tinned/ nickel-plated brass/ Zinc plated steel	
	ii) Size	Size M-8/M-6 and length as per inner dia of terminal hole for proper gripping and tightening of cable.	
18	Size of Terminal Hole	Size of terminal hole (internal diameter minimum)- 9.5 MM, as per CBIP	
19	Transducers		
	i) Input	CT & PT	
	ii) Output	LCD display with back light as & when needed	
	iii) Accuracy	Class-1.0	
20	Type of Display		
	i) No. of Digits display	7 (One digit after decimal point)	
	ii) Character size of display digits	10 MM	
21	Fixing/sealing arrangement		
	i) Fixing of meter	3 fixing holes (one at top & two at bottom terminal block)	
	ii) Sealing of meter cover to Base	2 nos., tightening from rear	
	iii) Sealing of terminal cover	One	
	iv) Min. size of flanges for tightning the sealing screws in meter cover and terminal cover	Terminal cover – 6 mm Meter cover - 10 mm (including top cover & base flanges)	
22	Type of hinged undetachable terminal cover & size/ thickness of hinges	Book (Door) type opening	
	Note:-	**Meter cover should be ultrasonically welded with base as per specification. In case of encapsulated design base and top cover shall be chemical welded.** **.**	
23	Performance of meter in tamper conditions		

Sl. No.	Test	Minimum requirement	As per firm's offer
	i) Phase-neutral interchanged	Should work within specified accuracy	
	ii) Main & load wire are interchanged	--do--	
	iii) Load is not terminated back to meter & current is drawn through local earth fully or partially	--do--	
	iv) Indication on above tamper conditions	LED indication	
24	(i) Injection of abnormal frequency and voltage of the order of 35 KV with help of external device.	Should sustain	
	(ii) Suitability of meter to sustain over voltage i.e. phase to phase voltage injected between phase & neutral	Should sustain as per relevant IS	
25	Size of calibration LED & colour as per clause 5.12.3	to be indicated	
26	Electromagnetic compitability (EMI/EME severity level)	Should withstand severity level 4.	
27	Effect on accuracy of external electromagnetic interfe. of electrical discharge, external magnetic field & DC current in AC supply or in neutral.	Should work within accuracy as per latest ISS & CBIPreport-325	
28	Effect of accuracy in tamper conditions	Meter should record as per relevant electrical condition	
29	Cut off voltage (at which meter stop working)	Cut off voltage (at which meter stop working) shall be below 40% of the rated voltage (Vref)	
30	If there is current Ix (equal to or more than 2% Ib) in a phase even if reference voltage of that phase is Vx (equal to or less than 50% of V rated)	In such a case meter should record energy = V rated X Ix (taking u. p. f.) (The measurement for the affected phase will start at Vref, Actual Current in that phase and UPF after persistence time of 5 Minutes. And the tamper shall be recorded as Current without Voltage Tamper with time stamping and KWH reading) As there is no OBIS code for current without voltage tamper, the logging of missing potential tamper instead of	

Sl. No.	Test	Minimum requirement	As per firm's offer
		current without voltage tamper is excepted.	
31	Input voltage & frequency variation within which meter works satisfactory	+20%- -40% of V. ref. +_ 5% of req. Frequency	
32	Relative humidity	95% (some times approaches to saturation)	
33	Ref. Temperature	27oC	
34	Temperature range of operation	-10oC to 60oC	
35	Drift in accuracy of measurement with time	No Drift in accuracy in measurement with time	
36	Fixing arrangement of name plate	Meter rating shall be fixed inside the meter cover and should be clearly visible from the window. It should not be faded with time.	
37	Approximate weight of meter	To be mentioned	
38	Type of body	Projection type	
39	Manufacturing activity		
	i) Whether SMT components & technology used	SMT component & technology necessary	
	ii) Whether submitted quality assurance plan	Required to submit	
40	Testing facility		
	i) Whether fully automatic computerised meter test bench with print out facility available	Must available	
	ii) Make & S.No. of Test bench	-	
	iii) Accuracy of ESS duly caliberated	0.1 class ESS	
	iv) Whether following in house testing facility available:		
	a) Insulation resistance	Must be available	
	b) Running on no load	-do-	
	c) Starting current	-do-	
	d) Accuracy requirement	-do-	
	e) Power consumption	-do-	

Sl. No.	Test	Minimum requirement	As per firm's offer
	f) Repeatability of error	-do-	
	g) Tamper condition	-do-	
	h) Electromagnetic compatibility	-do-	
41	Whether offered meter is type tested as per IS 16444 with latest amendment CBIP report-325 and tender specification.	Whether offered meter is type tested as per IS 16444 with latest amendment CBIP report-325 and tender specification	
42	Guaranteed life of meter	manufacturer's warranty till Contract period.	
43	Other parameters/features not covered in the above GTP	Shall conform to specification of IS-13779 & CBIP report No.325	
44	Whether the display sequence of the offered meter is as per the technical specification.	Should comply	
45	Whether the offered meter is having 8 ToD over as per technical specification	Should comply	
46	Whether the MD integration period of the meter is 15 min, based on shiding window participate.	Should comply	
47	Whether the tamper features of the offered meter are as exactly as per Annexure- I of Vol III of Tender.	Should comply	
48	Whether the performance on DC injection in complying with the ref. Annexure- I of Vol III of Tender.	Should comply	
49	Whether the load survey features are complying with the requirements	Should comply	
50	Sealing of meter	As per TS	
51	Parameters (In case of net-meter both export & import parameters to be measured)	Instantaneous: As per IS 15959 (Part 2): 2016 Billing parameters: As per IS 15959 (Part 2): 2016 Reactive Energy as per IS 15959 Part 1, Category D2 Meter Daily Load Profile: As per IS 15959 (Part 2): 2016	

Sl. No.	Test	Minimum requirement	As per firm's offer
		The billing parameters shall be retained in the meter for 6 months and should automatically rollover. Last 6 month billing parameters are required as per IS 15959 part3. The billing parameters shall be retained in the meter for 12 months and should automatically rollover. With additional parameters of export TODs, Profile parameters for meters (including Import - export parameters) shall be in line with IS16444 part1 requirements and import/export parameters shall be in line with the requirements of IS16444 part1 and IS15959 part2.	
52	Maximum Demand	Should have Maximum Demand registers kW and kVA with integration period 15 minutes. It should be programmable for 30/15 minutes. Resets should be auto-monthly as well as through HES. MD Recording should be based on sliding window principal with default MD integration Period 15 Min	
53	Load Survey/Interval Data	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. By default, LS parameters shall be with 15 Min. integration period.	
54	Time of Use	As per IS 15959 (Part 2): 2016	
55	LCD Indicators	As per IS 16444:2015	

Sl. No.	Test	Minimum requirement	As per firm's offer
56	Tamper/Event recording	As per IS 15959 (Part-2):2016. 200 events shall be stored in local memory of Smart Meters (100 occurrence and 100 restoration)	
57	Alarm switch / contactor	As per IS 15884	
58	Measuring Elements	Meter should have Four measuring elements – Three in phase and other in neutral path.	
59	Anti-Tamper features	As per TS	
60	Disconnection/Reconnection Mechanism	As per IS 16444.	
61	Connect/Disconnect Indication	As per IS 16444	
62	Programmability	It should be possible to program the parameters limits / values remotely through adequate security mechanisms. Once programmed it will be possible for the programmed parameters to come into effect from a certain date & time. Metrology under such condition must remain intact and shall not be upgradable from remote & Meter shall be as per IS 15959 part 2	
63	Communication and Communication Protocol	As per IS 16444	
64	RTC & time synchronization	Meter shall have RTC with 20 years calendar programmed in the memory and provision for time synchronization, the maximum drift shall not exceed +/- 300 Seconds per year. The clock day/date setting and synchronization shall only be possible through password/Key code command from remote server through RF communication network. Contractor shall submit the methodology for the synchronization of RTC.	
65	Data display facility (manual/Auto)	Data Display shall have following features: Data display facility (manual/Auto) Minimum 7-digit LCD display having minimum 8.5x5 mm min for all digits Display of data as per TS.	

Sl. No.	Test	Minimum requirement	As per firm's offer
		The Push button for manual scrolling in addition to auto scrolling with a persistence time of 10 seconds for each parameter shall be provided. High resolution (shall display energy value with resolution of 2 digits before decimal and 5 digits after decimal. Kwh total and fundamental kwh are essential to follow regulation • In case of Net Metering Import, Export and Net will be available at Meter Display and at HES also In case of prepaid meter Display parameters should be available as per IS 15959 and latest amendment and same shall be available at HES also. With additional parameters of export TODs, the requirement shall be in line with IS16444 part 2 for import - export meter parameters.	
66	Guarantee		
67	Remote Firmware Upgrade	As per IS 15959 (Part 2): 2016	
68	Testing of Smart Meter	Comply as per TS	
69	Other parameters/features not covered in the above GTP	Conform to specification of IS 16444 (with its latest amendment).	
70	Category	UC1	
71	Humidity	As per IS 13779	
72	Power Consumption of meter	As per IS 16444 Part 1	
73	Power Quality Information	As per IS 15959 Part-2	
74	Load Control	As per IS 16444 Part 1	
75	Data Retention	As per 16444 Part 2	
76	First Breath (Power on) and Last gasp (Power off) condition detection and communication to HES	As per IS 16444 Part 1	
77	Plug-in Communication Module		

Sl. No.	Test	Minimum requirement	As per firm's offer
		The Smart Meters shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF / Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN). It is accepted to have adaptability between NAN and WAN communication also through firmware up-gradation.	
78	Data display facility (manual/Auto)	As per IS 16444. However, minimum requirements should include the following: Data Display shall be in two modes- • Auto Scroll • Scroll with Push Button The display parameters shall be: • Auto Scroll • Display Check • Date and Time • Last Recharge Amount • Last Recharge Time • Current Balance Amount • Current Balance Time • Cumulative Active Energy kWh with legend. • Cumulative Active Energy kVAh with legend. • Current month MD in kW with legend. • Current month average Power Factor • Instantaneous voltage VRN • Instantaneous voltage VYN • Instantaneous voltage VBN • Instantaneous current IR • Instantaneous current IY	

Sl. No.	Test	Minimum requirement	As per firm's offer
		• Instantaneous current IB • Instantaneous current IN • Instantaneous Load kW and kVA • Instantaneous average Power Factor These parameters should be displayed on the LCD/LED continuously for a period of 10 seconds on Auto scroll. • Scroll with Push-button All Parameters mentioned under Auto-Scroll mode should be displayed. Additionally, the following Parameters shall also be displayed: • Internal diagnostics (display check) • Meter Serial No • Cumulative Energy in kVArh Lag/ Lead with legend • Cumulative Active Energy kWh ToD wise with legends. • Cumulative Apparent Energy kVAh ToD wise with legends. • Current month MD in kVAh with legends • Last month cumulative kWh with legends • Last month cumulative kVAh with legends • Last month MD in kW with legends • Last month Average Power Factor • 2nd Last month cumulative kWh with	

Sl. No.	Test	Minimum requirement	As per firm's offer
		legends • 2nd Last month cumulative kVAh with legends • 2nd Last month MD in kW with data and time of Occurrence • 3rd Last month cumulative kWh with legends • 3rd Last month cumulative kVAh with legends • 3rd Last month MD in kW with data and time of Occurrence Further, the Meter should display High Resolution energy values with resolution of 3 digits before decimal and 2 digits after decimal in push button mode. The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds. (The order of display may be as per the requirement of the Utility). Meter display should not go in to sleep mode during Power-On condition in case the push button is not operated for more than 10 minutes	

REMARKS:

(1) All the information/parameters indicated above shall exist in the meter offered & shall withstand all the tests specified above within the variation of current/voltage frequency and climatic conditions specified therein.

(2) Even though if any features or parameters are not specifically covered in this GTP, but are essential for the satisfactory performance of the meter as per the specification, are deemed to have been covered in the GTP.

VERIFICATION / TESTING OF METERS SUPPLIED

a) Type test

In case of order, three (3) samples for Type Test and DLMS conformance test shall be selected & sealed by authorized person of Discom from the first lot received in Purchaser's Area stores. The selected samples shall be sent with complete details for type test at CPRI / any NABL accredited test house. The type test charges shall be borne by the supplier.

In case of successful type test and DLMS conformance test results, supplies shall be continued. However, in case the meter(s) do not meet the requirement as per ISS/CBIP/Specification in type test(s), three more samples shall be selected from the supplies already received to get them type tested at supplier's cost. In case of repeat failure in type test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled.

b) Acceptance test

i) On receipt of subsequent consignment of individual DI in Area Stores, set of meters as per relevant standards shall be selected randomly and sent to CPRI or any other NABL accredited lab for conducting acceptance test as per the prescribed procedure.

ii) In case of failure of samples of lot/ sub-lot in the test(s) detailed in ISS, **the similar testing procedure as described shall be repeated on another lot and if the lot fails consecutive second time the entire quantity of respective lot/sub-lot shall be rejected and shall have to be replaced by the supplier** at his own cost. Repeated failure/poor results in the testing may render cancellation of order.

iii) The supplies, at the option of Utility, may be utilized in the field during the period of testing. In case of repeat failure in Type/Acceptance Test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled. The Utility also reserves the right to accept or reject the utilised quantity in the field on the basis of the test results.

iv) The utility also reserves the right to get additional samples for all or any of the selected tests at Utility's cost at any independent test house at any stage of supply, if so considered necessary to ensure that the quality of meters being offered for inspection is same as previously type tested meters.

In case of failure in type test, the Purchaser at its discretion may allow the supplier to re-offer the material after change/ modification in the design of meters. The balance material shall be accepted only after successful Testing. The Testing charges shall be borne by the supplier. However, the supplier will have to pay liquidated damage towards delay in supply on account of re-offer in accordance with original delivery schedule of purchase order.

ISI MARKED, DLMS COMPLIANT, CATEGORY-D2, LT STATIC WHOLE CURRENT 20-100 AMP or Better (10-100Amp) THREE PHASE 4 WIRE LCD DISPLAY METER WITH AMR COMPATIBILITY, CLASS 1.0s

Guideline:

1. In case of deviation in the below mentioned technical specifications from the IS applicable, then the AMISP has to comply with the IS applicable shall be IS:16444 Part-I & IS:15959 Part-II with latest amendment, wherever applicable.

(1) SCOPE & OBJECTIVE: -

(i) This specification covers design, manufacture, testing and supply of DLMS Compliant, Category-D2, ISI Marked, LT three phase four wire, 240 volt, class 1.0, 20-100Amp or better (i.e.10-100Amp), designed for over loading up to 120 Amps with accuracy guaranteed up to 120 amp static (electronic) trivector whole current LCD display meters with AMR compatibility for consumer metering. bidirectional communication option & remote connect/disconnect switch. The meter should the capable to record and display active, reactive, apparent and maximum demand in active / apparent 3 phase 4 wire AC balance/ unbalanced loads for a power factor range of zero (lagging), unity and zero (leading) as per requirement given in this specification. Meters shall be supplied along with base – computer software's (BCS) as per the details given in this specification.

It is not the intent to specify completely herein all the details of the design and construction of material.

(ii) The material shall, however, conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser.

The Communication port should be as per IS 16444. AMR through optical port/ GPRS is acceptable.

2. APPLICABLE STANDARDS: -

Unless otherwise specified elsewhere in this specification the performance and testing of the meters shall conform to the following Indian/International standards and all related Indian/International standards to be read with up to date and latest amendments/revision thereof: -

1	IS : 13779:1999 and IS 16444	A.C. static watt-hour meters for active energy (class 1.0s)
2	CBIP Tech Report 325	Specification for AC static electrical energy meters of CBIP New Delhi with its latest amendments.
3	IS 12063	Specification for degree of protection for enclosure.
4	*IS 15959*	Communication protocol

Unless otherwise specified elsewhere in this specification the static meters shall conform to the latest version available of the standard as specified above.

The equipment meeting with the requirements of other authoritative standards, which ensure equal or better quality than the standard mentioned above, shall also be considered.

In case of conflict the order of precedence shall be:

1. IS 15959
2. Specifications as per bid document,
3. Indian Standard, IS 13779 and IS 16444
4. CBIP Technical Report No.325

In case of any difference between provisions of these standards and provision of this specification, provisions contained in the bid document shall prevail.

3. SERVICE CONDITIONS: -

The offered meter shall be suitable for satisfactory continuous operation as per relevant standards under the following tropical conditions: -

a)	Maximum ambient temperature	:	50ºC
b)	Maximum ambient temperature in shade	:	45ºC
c)	Relative Humidity	:	10 to 95%
d)	Maximum Annual Rainfall	:	1450 mm
e)	Maximum wind pressure	:	150 Kg/m^2.
f)	Maximum altitude above mean seal level	:	1000 meters
g)	Isoceraunic Level	:	50 days/year
h)	Seismic level (Horizontal acceleration)	:	0.3g
i)	Moderately hot and humid tropical climate		

4. **SUPPLY SYSTEM:**

i)	LT system with voltage	-	3 ph. 4 wire 3x240V (phase to neutral)
ii)	Voltage variation	-	+20% to -40%
iii)	Current	-	Ib =20/10 Amp Imax =100 Amp or higher Designed for overloading upt o 120 Amp
iv)	Frequency	-	50 Hz
	Variation	-	+/- 5%
v)	Power factor	-	Zero lag-unity - zero lead

5. TECHNICAL REQUIREMENT & DESIGN CRITERION

5.1 Meters are required for installation in the premises of LT consumers.

5.2.1 The meters shall be suitable for LT whole current system.

5.2.2 The meter shall be 3 phase 4 wire type, suitable for continuously 240VAC (Phase to Neutral) and shall be capable of withstanding twice the nominal voltage i.e. 480 volt between phase to neutral (or earth).

5.2.3 The meter must be DLMS compliant category ‘D2’.

5.2.4 **Power consumption** :

i) Voltage circuit - As per IS 16444(Part1) with latest version

ii) Current circuit - As per IS 16444(Part1) with latest version

5.2.5 **Starting current** :- The meter should start registering at 0.4% of Ib as per IS: 16444 .

5.2.6 **Radio interference suppression and electromagnetic capability** :- The meter shall not generate conduct or radiate noise, which would interface with the other requirement. The above shall confirm to the requirement listed in the applicable standard.

5.2.7 **External magnetic Influence** - The meter shall not get influenced by any external magnetic fields (AC Electromagnet or DC Magnet) as per value(s) specified in CBIP technical reports no 325 for AC magnetic field.

5.2.8 **Running with no load** : When the 115% of rated voltage is applied with no current flowing in the current circuit, meter shall not register any energy and test output of the meter shall not be more than one pulse on no load as per IS: 16444(Part1).

5.2.9 The meters shall work satisfactorily in the absence of neutral, and shall work even if any two voltage wires are extended to the meter.

5.2.10 T**he whole current meter shall be designed for 20-100/10-100 Amp or higher rating with overloading upto 120 Amp**. The meter operating software should be programmable so as to enable direct reading of energy & other quantities on the metered (primary) circuit,

5.2.11 Accuracy - Class 1.0

5.2.12 The meters shall make use of Non-Volatile Memory, capable of storing & retaining all the data required to be stored, without the help of any power source or battery backup.

5.2.13 Computation of demand shall be on the basis of Real Time Clock of the meter itself.

5.2.14 Provision shall be there to do the billing operation automatically at a predefined date by programming the meter accordingly, provision of programming minimum 12 billing dates shall be there. If required billing shall also be possible with the press of MD reset button. The default billing date shall be 1st of every month. However, this feature should be user programmable.

5.2.15 The meter shall have provision to store the billing values of KWh / KVAH and MD(KW and KVA) & TOD reading for minimum of last 12 MD resets.

5.2.16 Meters covered under this specification shall be fully static type with non-volatile memory to register various billing parameters and complete with other features as detailed out in this specification. Any other design meeting technical specification requirements or features/accuracy etc., better than this specification requirement manufactured as per relevant IS shall also be acceptable.

5.2.17 Meters shall be suitable for accurate measurement and display of energy and other billing parameters within the specified limits of errors under balanced and unbalanced loads conditions in a poly phase network.

5.3 POWER FACTOR RANGE :- Meters shall be suitable for measurement of billing parameters with specified accuracy for full power factor range i.e. zero lag unity - zero lead.

5.3.1 The meter shall be full programmable by the user for TOD timings and billing dates etc. For security reasons, the meter operating software should have at least “two level write protection” against any modification/editing ofthe parameters, data, setting etc. except those required for Billing data, TOD metering & meter shall be as per IS15959 part 2

5.4 CALIBERATION, CONFIGURATION AND PROGRAMMATION :-

The meter should be only factory calibrated, configured and programmed. No device, such as potentio meters shall be used which can result in change of calibration at site. The above activities should not be possible at site through the use of users software or any such means. It shall, however, be possible to check the accuracy in the field by means of the test output. No setting points/setting registers etc. shall be provided for adjustment of measurement errors. Once finalized, the meter constants shall be freeze and it shall not be possible by the manufacturer or the user to alter the meter constants at factory or at site.

5.5 Provision shall be made to read various billing parameters and tamper data recorded by meter through a meter reading instrument. This arrangement can be through an optical port or any other suitable device. Provision shall be made to seal the optical port to ensure proper security.

5.6 Meters shall be designed for satisfactory operation with the following supply voltage/frequency variation :-

Voltage - V.Ref + 20% to -40%

Frequency- +/-5%

For above voltage and frequency range, the meters shall measure, register and display various parameters accurately.

5.7 **DISPLAY PARAMETERS** (On pressing of push button i.e. billing parameters)

Parameters are required in three different mode Auto display mode, Push button mode and downloaded parameters.

AS PER TS PARAMETERS SHOULD BE DISPLAYED ON PRESSING OF PUSH BUTTON.

The display shall be liquid crystal type with all display parameters available on display. There shall be 7 segments 7 digits for display of parameter value. The LCDs shall be capable of being powered on by Internal Battery and it should be activated by Pressing the Push Button to Display the Parameters in the event of power failure. The height of display unit shall be minimum 8.5 mm and which shall be clearly visible from distance.

a) General Requirements

(I) Auto display mode

i) Date DD:MM:YY
ii) Time HH:MM
iii) Cumulative kWh
iv) MD KW and KVA
v) Instantaneous P.F with sign of Lag / lead
vi) Average PF to be provided for previous 6 months.
vii) Main Billing active KWh
viii) TOD 1,2,--,6 Billing active KWh
ix) Billing MD kW and KVA

(II) Display Parameter Push Button mode

The display of the following parameters shall be continuously scrolling one after another through push button. The display shall have 'ON' time of at least 10 seconds of each measured value, except LCD segment check. The LCD segment check shall be on meter display for 15 seconds. Display parameters shall move forward if button pressed prior to the programmed time for display of each parameter.

i) LCD segment check
ii) Date DD:MM:YY
iii) Time HH:MM
iv) Rising demand register
v) MD reset count
vi) Cumulative kWh energy register
vii) Cumulative kVArh lag energy register
viii) Cumulative kVArh lead energy register
ix) Cumulative kVAh energy register
x) KW and KVA MD register
xi) Cumulative MD register KW and KVA
xii) Instantaneous P.F with sign of Lag / lead
xiii) Frequency
xiv) TOD 1,2,--,8 Cum. KWh
xv) TOD 1,2,--,8 Cum. KVAh
xvi) TOD 1,2,--,8 MD KW and KVA
xvii) Average PF to be provided for previous 6 months.
xviii) Billing MD kW and KVA
xix) Billing MD date
xx) Billing MD time
xxi) TOD 1,2,--,8 Billing MD registers
xxii) Main Billing KWh register
xxiii) TOD 1,2,--,8 Billing KWh registers
xxiv) Main Billing KVAh register
xxv) TOD 1,2,--,8 Billing KVAh registers
xxvi) Tamper information-This shall be displayed when tampered with following.
   a) Date of last tamper occurrence
   b) Time of last tamper occurrence
   c) Number of times meter tampered

b) **Programmable Optional Requirements:** Meter should be as per IS15959, however the extra parameter shall be available on display.

i) Phase wise current - A
ii) Neutral Current - A
iii) Phase wise Voltage - V
iv) Instantaneous Power - KW and KVA

C) **View Parameters (display/information required through MRI/BCS/ AMR) shall be as per IS:16444 with latest amendments.**

5.8 MAXIMUM DEMAND REGISTRATION

Maximum demand computation shall be updated based on only sliding window principle & demand integration period of 15 minutes. The meter shall monitor during each integration period of the month & display maximum value occurred.

5.8.1 The MD integration cycle shall be on the basis of real time. However the real time clock of the meter shall be used only for the purpose of time matching and for computation of maximum demand an internal clock of the meter shall be made use of.

5.9 **MD RESET** :- The meter shall have following MD resetting options :-

a) Automatic reset at the end of certain predefined period. (Say, end of the month - default).

b) Resetting through a hand held terminal capable of communicating with the meter (with proper security)

c) Manual resetting arrangement (MD reset button) with sealing facility.

5.10 **Load Survey** :-

As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days.

5.11 **TAMPER FEATURES** :

The following tamper information shall be available in the meters to detect common ways of tamper & fraud.

a) **Missing Potential detection** :- The meter shall detect PT miss and record this information along with date & time of occurrence and restoration of the event and phase indication.

b) **CT Reversal Detection –** The meter shall detect and indicate the occurrence of CT reversal on meters display along with phase indication and shall also store the date and time of occurrence and restoration in the non volatile memory. Even if meter detect such a condition, but recording of energy and demand of the meter shall be done in positive direction only.

c) **Current Imbalance (CT shorting/by passing)** :- In case of CT open or shorting, which may result in the current imbalance between the phases, the tamper indication should appear, if the load is more than 40% of the rated current (Ib) of the meter & imbalance is more than 30% & exists for 5 minutes or more. Tamper logging should be as per IS 15959.

d) **Power ON/OFF**:- Meter shall be capable of detecting & recording power off if all voltages are not present. The event shall be recorded on the next power up. At the same time, power on event shall be recorded.

e) **Phase Sequence Reversal** :- Meter shall record accurately irrespective of the phase sequence of the supply.

f) **Neutral Missing**:-

The meters shall work properly even if neutral is not available and shall work satisfactorily even if any two of potential wires are extended to it. The meter shall work properly in the absence of both incoming and outgoing neutral. Meter should be immune to the neutral missing & the recording should not be get affected in absence of both incoming & outgoing neutral.

The meter shall not get influenced by injection of AC voltages / chopped signals/ DC signal and harmonics on the outgoing leads of the meter. The meter should able to detect / protect and display the recording of the tamper. Meter should be protected & completely immune against injection of AC voltages / chopped signals/ DC signal and harmonics on the outgoing leads of the meter & meter recording should not be affected.

When DC is injected in neutral circuit and the meter voltage increases above 300 V, Meter will do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. Recording and indication of tamper must occur under this condition.

g) **External Magnetic Interference** – The meter shall not get influenced by any external magnetic fields (AC Electromagnet or DC Magnet) as per value(s) specified in CBIP technical reports no 325 with its latest amendments for AC magnetic field. The meter shall be capable of detecting / recording and displaying the presence of external magnetic field near the meter as per relevant standard and declare as a Magnetic Interference.

h) **Meter cover open tamper**: - If attempt is made to open the meter body, the meter shall **detect /log with date and time** of meter body opening tamper, even in absence of supply. This tamper shall also be displayed on the meter LCD in auto scroll mode. The auto scroll mode shall be locked with display of this tamper and push button mode shall work normal on pressing the push button.

i) **Neutral Disturbance -** The meter shall be capable of detecting / recording and displaying of Neutral Disturbance when spurious signal applied through the neutral.

j) Along with the information, the meter shall also record the instantaneous values of all three phase voltages, three currents, three phase power factors to elaborate the existing condition during all the type of tamper events. Meter should be as per IS 15959.

k) The meter shall record 200 events of PT Miss CT reversal/current imbalance (Occurrence + restoration) along with date and time of occurrence and restoration of each and every event. The event recording shall be compartment wise roll over type i.e., it shall always maintain record of last 200 events occurred. Logics for design of above indicated tamper, the value of voltage current time etc. to be selected for design of tamper logics shall be in consultation with the purchaser. (The last tamper event as per above tamper is to be included in the DISPLAY and rest of the details in VIEW PARAMETERS).

l) **Performance of DC injection :** Apart form all the technical requirements as specified above. The meter should not saturate on passage of direct current, which can cause the meter either to stop recording or record in accurately as per IS: 13779 (latest version).

m) Low Voltage: The meter shall detect low voltage tamper and record this information along with date & time of occurrence and restoration of the event. In such tamper period meter should record energy in class of accuracy. Approval of tamper threshold may be obtained from Purchaser before placing of order.

n) Voltage unbalance: The meter shall detect voltage unbalance tamper and record this information along with date & time of occurrence and restoration of event. In tamper period meter should record energy as per IS16444. Approval of tamper threshold may be obntained from Purchaser before placing of order.

5.12 Provision shall be made for push button to initiate display parameter in the front of the meter.

5.12.1 Provision shall be made for maximum demand reset push button complete with provision to seal the MD reset push button.

5.12.2 Provision shall be made for programmable time between the two maximum demand reset operations.

5.12.3 An operation indicator in the form of blinking optical signal shall be provided to indicate that the meter is operating satisfactorily. Tenderers may confirm whether the blinking optical signal is of weighted pulse and this can be effectively used for verification of accuracy. Whether the intensity of blinking signal is sufficient for detection by the optical sensor may also be confirmed by the tenderers.

5.12.4 Meters shall be programmed for auto display of billing parameters with provision of :-

- 15 seconds time display of each billing parameters auto scroll.
- Display cycles shall be repeated after 15 minutes.

5.12.5 Tamper information shall remain available on Meter Display in case Meter Tampers Persists in the Meter. Once Tamper Event is removed, Display Indication shall disappear from the Meter Display. However, the Tampers which are logged shall only be available in case same are being required on Meter Display.

6. Application of abnormal voltage/frequency:

A) The accuracy of the meter should not be affected with the application of abnormal voltage/frequency such as spark discharge of approximately 35KV in any of the following manner for 10 minutes:

i) On any of the phases or neutral terminals

ii) On any connecting wires of the meter

iii) Voltage discharge with 0-10 mm spark gap

iv) At any place in load circuit

v) Spark on meter body.

Remark: Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and meter should be immune in both condition.

Note :

1. The measurement by meter shall not get influenced by injection of AC Voltages/ chopped signal/ DC signal and harmonics on the outgoing leads of the meter or if get affected it will log the ND event & do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within ±3% as per Indian Standard.

   When AC voltage chopped in the neutral circuit and the meter voltage increases above 300 V, all three phase relays should be disconnected in this condition to prevent drawing a load from phases. Recording and indication of tamper must occur under this condition.

2. The meter shall not get affected by any remote device. As per Ts (Jammer test/35 KV spark may be performed in two condition 1. when NIC card is placed in meter and meter is mounted inside of meter box as per actual field condition 2.On the meter without NIC card and meter is outside of meter box). Remote device means any electrical or electronic or electromechanical or any other equipment.

3. The bidder should furnish detailed explanation as to how the meter is able to detect/ protect recording the above tamper and fraud features with sketches and phaser diagram. Additional features, if any, in the meter may also be clearly indicated.

4. For proper recording of the meters in case there is current Ix (equal to or more than 2% Ib) in

   a phase even if reference voltage of that phase is Vx (equal to or less than 50% of V rated)

   then in such a case meter should record energy = V rated X Ix (taking u. p. f.)

   (The measurement for the affected phase will start at Vref, Actual Current in that phase and UPF after persistence time of 5 Minutes. And the tamper shall be recorded as Current without Voltage Tamper with time stamping and KWH reading)

   As there is no OBIS code for current without voltage tamper, the logging of missing potential tamper instead of current without voltage tamper is accepted.

(B) Meter should also be immune for tamper by application of remote induction device (Jammer) when meter with communication module is placed inside of meter box and when meter without communication module is placed outside of meter box.

7. **TOD TARIFF/DEMAND**:

The provision shall be there to programme TODs for energy and demand, through meter reading instrument. Minimum 8 times zones provision shall be there. The TOD registers shall be made available on display. By default, meter Shall display 4 TOD zone on display and shall be configurable. TOD timing are as follows:
TOD1: 22:00 hrs to 06:00 hrs (Next day)
TOD2: 06:00 hrs to 09:00 hrs
TOD3:09:00 hrs to 17:00 hrs
TOD4: 17:00 hrs to 22:00 hrs

7.1 Provision should be made for automatic reset of maximum demand at the end of pre-defined period (as for eg. end of the month). The billing parameter at the time of automatic reset of the maximum demand shall be stored for atleast 12 months and display shall be possible on demand at the BCS end to be downloaded through MRI. Period as to when automatic reset of maximum demand is required shall be programmable. In addition reset of maximum demand shall be possible through push button or through a hand held terminal capable of communicating with the meter.
In every case the design shall include provision of updation of cumulative demand register with updation of reset counter. Recording of MD based on sliding window principal with 15 minutes integration period with 5 minutes sub interval period. It shall be programmable for 15 minutes and 30 minutes (DIP) with 5 minutes and 10 minutes subinterval period. Billing date shall be programmable.

7.2 Necessary compatible meter application software for various programmable features as discussed above in the meter and also necessary software for the compatible computer to obtain various details as discussed above shall be provided by the supplier. No separate cost will be borne by the purchaser on this account.

7.3 Base Computer Meter application software

BCS shall be supplied by AMISP for each type of meter.

For efficient and speedy recovery of data read through meter reading instrument, base computer software shall be supplied having the following specifications as below:

The BCS software shall be windows based, user friendly. The data transfer shall be highly reliable and fraud proof. Base computer software shall give all details adequate for analysis and abnormal event data & load surveys parameters. The software shall have the facility to convert all the consolidated information / data of selectable parameters into ASCII format EDP department of purchaser can generate its own DBF (Data base files) to download all the required information into it. The BCS should support automatic meter reading with the help of GSM /GPRS/RF NIC. BCS shall be supplied by AMISP for each type of meter.

i. Platform:

The BCS shall be executable on **MS windows 10 or higher version**. The BCS shall be suitable to run on PC or compatible hardware platform.

ii. Meter Data Display:

The software shall show electrical condition existing at the time of reading the meter in tabular forms as well as graphical format. (Phase diagram)

All the information above energy, maximum demand and their respective TOD register reading, billing register readings shall be shown in a manner which user can easily understand.

All the load survey data shall be available in numerical as well as graphical format. It shall be possible to view this data daily, weekly, and monthly format. The load survey graph will show values where the cursor is placed for the selected or for all parameter.

All the information above abnormality events shall be accompanied with date and time stamping. This information shall be displayed in the sequence in which it happened in cumulative format as well as summary format.

The software shall be capable of preparing CMRI to read the meter information or time setting of the meter.

iii. **Support Display**

There shall be “user friendly” approach for viewing meter data for the reading collected now or for the reading collected in the past. All information about a particular consumer will

be sorted out and available at one place so that locating any consumer's past data is easy. It shall be possible to retrieve/locate data on the basis of either one of the following particulars.

a. Site's ID/Numbers

b. Meter Sr. No.

c. Date of meter reading

d. Location

e. MRI File. (Meter Reading File)

iv. <u>The Data Transfer</u>

It shall be possible to transfer data to and from meter reading instrument through serial interface.

v. <u>Configurability:</u>

It shall be possible to have selective printing out of all available data of the meter. Print out shall not include anything and everything available with the BCS. The software shall support "print wizard" whereby user can decide what to print out. The use of the software need not revert back to the supplier of the software for modifying the software just to print what he desires.

BCS shall have facility to export data to ASCII or spreadsheet format for integrating with the purchaser's billing system. Here again an "Export Wizard" or similar utility shall be available whereby user can select file format, what data to export, the field width selection etc.

vi. <u>Security</u>

The BCS shall have multilevel password for data protection and security. The first level shall allow the user to enter the system. The different software features shall be protecting by different passwords. The configurable of passwords shall be user definable. The software installed on one PC shall not be copied on another PC.

vii. <u>Help</u>

The exhaustive online help shall be available with the software so that user can use all the features of the software by just reading the help contents.

8. **<u>DATA SECURITY</u>** :
The data transfer from the meter to MRI and MRI to computer should be fully secured and any unauthorised change in data change should be indicated on computer system. There should be multi label pass word on the base computer system and in the meter to prevent any unauthorised change of TOD timings or resetting of demand, reading of meter etc.

9. A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The maximum drift in real time internal clock of meter shall not exceed ±60 seconds per year when powered by internal battery or supply. The information of meter including and integration etc. shall be independent of requirement of battery. A Lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The meter shall perform satisfactorily without any requirement of external Lithium battery even under power off condition. The minimum life of lithium battery should be ten years.

9.1 Under battery weak condition an indication shall appear on the meter display and flag with self diagnostic feature shall be logged in meter and should be shown at BCS end. The location of lithium battery shall be such that it should be possible to replace the battery at site. All specifications shall adhere to IS specifications as per CBIP 325. As per Contract agreement, it is required for MRI and testing work

Under battery weak condition an indication shall appear on the meter display and flag with self-diagnostic feature shall be logged in meter and should be shown at HES/BCS end

10. **OUTPUT DEVICE** :

The meters shall have a test output in the form of a blinking LED for testing of the meters accuracy. Testing shall also be possible through optical port accessible from the front and can be monitored with Meter Reading Instrument having high resolution display.

The meters shall give high resolution energy values directly to meter reading instrument. The resolution will be sufficient to enable conduction of the starting current and accuracy test in less time.

11. COMMUNICATION PORT & COMMUNICATION PROTOCOL

The Whole Current Static Meter for consumer metering should be DLMS Compliant open protocol conforming to IS 15959 for category 'D2' & Indian Companion Standard.

The energy meter shall have a galvanically isolated optical communication port, so that it can be easily connected to hand held common meter reading instrument for data transfer to or from meter reading instrument with proper security and without error OR subsequently hooked to a remote metering device. The optical port shall be located in front of the meter and shall have adequate sealing arrangement to seal it. Serial communication protocol shall be adopted for data communication. In the forthcoming paragraphs requirement of a D-port telemetering purpose has been described. Meters covered under this tender will be employed for metering at the premises of LT consumers for tariff application. The instantaneous parameters load survey data and tamper information etc will be monitored remotely through computer installed in central station. The data from meter will be transferred to the central station through the either GSM / GPRS/RF communication links as meter are required to be completed with capability of remote meter reading. It will be obligatory on the part of the bidders to supply the software in adequate copy needed for remote meter reading. No separate cost towards remote meter reading software using GSM / GPRS technology/RF will be born by the purchaser. The meters shall be compatible for AMR using GSM / GPRS /RF. The communication port shall be as per IS 16444.

11.1 A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The information of meter including and integration etc shall be independent of requirement of battery, A Lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The meter shall perform satisfactorily without any requirement of external Lithium battery even under power off condition.

11.2 Output device : The meters shall have a test out put in the form of a blinking of LED for testing of the meters accuracy. Testing shall also be possible through optical port accessible from the front and can be monitored with meter reading instrument having high resolution display.

The meters shall give high resolution energy values directly to meter reading instruments. The resolution will be sufficient to enable conduction of the starting current and accuracy test in less time.

Meters shall have two number galvanically isolated ports one for collection of data for load survey and other parameters through the meter reading instrument which can also be subsequently connected to a GSM/GPRS/RF Media for remote metering and other for remote meter reading purpose only. The load survey port shall have optical coupler for transfer of data from meter to the meter reading instrument or modem as the case may be. In addition to this load survey port, provision shall be made for another D- port, which will be permanently hooked to the

RTU/Modem/NIC for the purpose of remote meter reading. While designing this port due care shall be taken and it shall be ensured that damage to the meter/meter circuitry is not possible by injecting magnetic/ electrical charges through this D- port. A specific confirmation, that, these considerations have been taken care of, shall be made by the tenderer.

Communication protocol standard- Meter shall have galvanically isolated communication port as per IS16444 i.e., one galvanically isolated optical port for load survey facility etc. & another for WAN/NAN communication module.

The port for load survey data collection shall be suitable to receive the coupler of CMRI and certain changes in the meter configuration as discussed elsewhere in the tender should be possible through this port and only through this port. The other D-post is exclusively for remote meter reading purpose and communication to the meter through this port for programming purpose should not be possible. Meter should be as per IS15959 & programmable feature should be as per IS15959 for category 'D2' meter. Provision for sealing shall be made for both communication ports, For the output ports available in the meter standard communication protocol shall only be adopted.

11.3 Meters shall have provision for testing of meters in the meter testing laboratory or testing of meters at site with the help of electronic substandard meters and phantom load test set. (In order to reduce the testing time of meter particularly for verification of demand suitable facility shall be provided through meter reading instrument).

11.4 Meter shall operate and record satisfactorily independent of phase sequence of input supply so long as phase association between voltage and current circuit is in order.

11.5 No Setting point / setting register etc. shall be provided for adjustment of measurement error.

11.6 Necessary software for various programmable features as discussed above in the meter and also necessary software for the compatible computer to obtain various details as discussed above and additional if any shall be provided by the supplier. No separate cost will be borne by the purchaser on this account. The software shall include provision for load survey graphic presentation and other reports generation in BCS from the data collected form the meter through meter reading instrument. For efficient and speedy recovery of data read through meter reading instrument, base computer software shall be supplied having the following specifications as below:

The BCS software shall be windows based, user friendly. The data transfer shall be highly reliable and fraud proof. Base computer software shall give all details adequate for analysis and abnormal event data & load surveys parameters. The software shall have the facility to convert all the consolidated information / data of selectable parameters into XML format which should be clearly defined. The EDP department of purchaser can generate its own DBF (Data base files) to download all the required information into it.

12. CONSTRUCTION OF THE METER :

The components on the PCB shall be of surface mounted to ensure reliable performance even under shock/vibration. Body the meter shall be designed suitable for projection mounting. The meter should be made of high-quality raw materials to ensure higher reliability and longer life. The meter should be compact and reliable in design e.g. to transport and immune to vibration and shocks involved in transportation/handling. The construction of the meter shall be suitable for its purpose in all respects and shall give assurance of stable and consistent performance under all conditions especially during dust storms/heavy rains/very hot days. The meter shall conform to IP-51 according to IS-12063. All insulating material used in the construction of the meter shall be non-hygroscopic non ageing and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion. The construction of the meter shall be such as to be sealed independently and prevent unauthorized tampering.

Meters described above shall be installed in consumer premises outdoor inside a meter box, directly under the sun and extreme weather conditions. Suitability of such a use shall also be confirmed. It should be polycarbonate box.

12.1 **METER CASE** :-

The meter shall have a case, which can be sealed in such a way that the internal parts of the meter are accessible only after breaking the meter cover and two sets of seals, one that of terminal cover and the other of the meter cover. The meter case shall be made of self extinguishing polycarbonate. The case shall be so constructed and arranged that any non permanent deformation cannot prevent the satisfactory operation of the meter. The degree of protection shall be IP 51. Color of Meter: Grey/Opaque base & Transparent/Opaque Top cover & Translucent/transparent/Opaque Module cover and Transparent Terminal cover with wire entry Cut.

12.2 **TERMINALS & TERMINAL BLOCK** :- The meter shall have brass/ tinned plated brass terminals/ Ni-plated brass and the holes in the insulating material, which form an extension of the terminal holes shall be of minimum 9.5 mm diameter as per CBIP Technical specification for whole currentmeter. To accommodate the insulation of the conductors and shall be of adequate length in order to have proper grip of conductors/crimping pins with the help of two screws, such that there is no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixing which may be loosened and tightened several times during the life of meter shall be such that the risk of corrosion resulting from contact with any other metal parts is minimized. Electrical connections shall be so designed that contact pressure is not transmitted through insulating material. For current circuit, the voltage is considered to be the same as for the related voltage circuit. The terminal block shall satisfy all the conditions such as clearance and creepage distance between terminals and surrounding part of the meter as specified in relevant clause of CBIP technical report 325.

12.3 **TERMINAL BLOCK COVER**:- The terminal block cover for the meter shall be extended transparent type, which can be sealed independently & over the meter cover. The terminal cover shall enclose the actual terminals, the conductor fixing screws and 10mm of the external conductors and their insulation for which the terminal cover shall be of extended type. The terminals shall not be accessible without removing the seals of the terminal cover when energy meter is mounted on the meter board. Adequate workable space shall be provided in the terminal block. The Terminal cover shall be 30 mm extended & with wire entry cut.

12.4 **INSULATION** :- The meter shall have durable and substantially continuous encloser made of wholly insulating material, including the terminal cover, which envelops all metal parts with the exception of small parts and should withstand an insulation test at 4 KV.

12.5 **RESISTANCE TO HEAT AND FIRE** :- The terminal block, the meter case shall ensure reasonable safety against the spread of fire. They should not be ignited by thermic overload of live parts in contact with them. To comply there with, they must fulfill the test requirement specified.

13. **SEALING OF THE METER** :

The meter cover shall be ultrasonically welded/ chemically welded in case of encapsulated design with the base so that the cover could not be opened without breakingProper sealing arrangements shall be provided on the meter to make it tamper proof and avoid mishandling by unauthorized person. At least two (2) seals on the body, two (2) seals on the terminals block and one seal each on maximum demand device andcommunication port shall be provided.

In addition to above following sealing arrangement shall have to be provided:-

(i) All meters shall be sealed by the manufacturer at its works.

(ii) A tracking and recording software for all new seals shall be provided by the manufacturer of the meter to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal

(iii) Seal shall be unique for each utility and name or logo of the utility shall be clearly visible on the seals

(iv) Only the patented seals (seals from the manufacturer who has official right to manufacture the seal) shall be used.

(v) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seals shall be used.

(vi) Lead seals shall not be used in the new meters.

No extra cost to be incurred towards compliance of these additional provisions.

14. **CONNECTION DIAGRAM & TERMINAL MARKING** :-

The connection diagram of the meter shall be clearly shown on inside portion of terminal cover & shall be of permanent nature. Meter terminals shall also be marked & this marking should appear in the above diagram. CONNECTION DIAGRAM IS AVAILABLE ON T-COVER

14.1 The holes for lead sealing wire may be 2mm one hole should be provided in the head and one in the threaded portion and as per meter design necessary approval may be taken from competent authority. 2 NOS sealing screw for Meter Body and 2nos Sealing screw for Module cover and 2nos sealing screw for T-Cover will be provide. Each sealing screw having 2 hole on Head Portion. Hole in thread portion not due to screw thread must be enclosed in Meter Body. Sealing screw must tighten from Top Cover to base.

14.2 Meter shall have a name plate clearly visible effectively secured against removal and indelibly and distinctly marked with all the essential particulars as per relevant standards i.e.

a) Manufacturer"s name and trademark
b) Manufacturer"s serial number
c) Type and description
d) Accuracy Class
e) Rated current, voltage and frequency
f) Relevant ISS/IEC No. should be printed along with ISI certificate mark.
g) Manufacturer's meter constant shall invariably be indicated duly printed.
h) Name of the owner, purchase order No. and date and month/year of manufacturing as indicated below, suitably abbreviated shall be printed :-

OWNER	P.O.NO./MONTH	DATE/YEAR	TENDER NO.

i) Guarantee Period

15. **INSTALLATION CHECK** :- While installing the meter, it shall be possible to check the correctness of the connection to the meters and there polarity from the functioning of the meter with the help of CMRI under load condition. The phase sequence and phased association of voltage and current can be checked with the help of CMRI.

16. TESTS & INSPECTION :

16.1 **ACCEPTANCE TEST** :- All acceptance test as per IS:116444 to be read along with CBIP report-325 shall be carried out on the meter.

16.2 **ROUTINE TEST** : - All routine tests as per IS: 16444 TO BE READ ALONGWIHT CBIP REPORT-325 shall be carried out on all the meters.

16.3 **PRE DESPATCH INSPECTION**:- All acceptance tests and inspection shall be carried out at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and purchaser at the time of purchases. The manufacturer shall offer to the inspector representing the purchaser all the reasonable facilities, free of charge, for inspection and testing, to satisfy him that the material is being supplied in accordance with this specification. The Board's /discom's representative/Engineer attending the above testing will carry out testing as per IS:16444 TO BE READ ALONGWIHT CBIP REPORT-325 & as per this specification and issue test certificate approval to the manufacturer and give clearance for dispatch.

17. **AFTER SALES SERVICE** :

In order to provide prompt & smooth after sales support/service etc., it shall be preferred to post/engage an engineer/technician in MP preferably at Indore by the manufacturer, who shall be fully conversant with the manufacturers meters, to attend any minor defects immediately & to educate the users about proper installation of meter and programming of

MRI, Base computer, taking reading, billing data, load survey, tamper information etc. through MRI & down load to PCs to get printouts etc.

18. QUALITY ASSURANCE IN MANUFACTURING/TESTING :

18.1 MANUFACTURING ACTIVITIES:

Quality should be ensured at the following stages:

(a) At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.

(b) At insertion stage, all components should undergo computerized testing for conforming to design parameters and orientation.

(c) Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipments (ATEs).

(d) Prior to final testing and calibration, all meters shall be subjected to aging test (i.e. meters will be kept in ovens for 72 hours at 55 deg. cent. temperature and atmospheric humidity under real life condition at its full load current. After 72 hours meters should work satisfactorily) to eliminate infant mortality.

(iii) The calibration of meters shall be done in house.

(iv) The bidders should submit the list of all components used in meter along with the offer.

18.2 **MINIMUM TESTING FACILITIES**:

Manufacturer should posses fully computerized Meter Test Bench System for carrying out routine and acceptance tests as per IS: 13779/IS16444 TO BE READ ALONGWIHT CBIP REPORT-325. In addition this facility should produce Test Reports for each and every Meter. The tenderer should have the necessary minimum testing facilities for carrying out the following tests.

i) A.C. Voltage test
ii) Insulation Resistance Test
iii) Test on limits of errors
iv) Test on meter constant
v) Test of starting condition
vi) Test of no load condition
vii) Repeatability of error test
viii) Test of power consumption
ix) Vibration test
x) Tamper conditions - as per Utility's Specification
xi) The manufacturer should have duly calibrated ESS meter of class 0.1 accuracy.

19. **PACKING** :

19.1 **CRIMPING LUGS** :- With each whole current meter 8 nos. copper lugs matching with terminal hole size shall be provided.

19.2 Each meter may be suitably packed in the first instant to prevent ingress of moisture and dust and than placed in cushioned carton of a suitable material to prevent damage due to shocks during transit. The lid of the carton may be suitably sealed. Each meter be packed in a separate cushioned carton. A suitable number of selected cartons may be packed in a case of adequate strength with extra cushioning, if considered necessary. The cases may be properly sealed against accidental opening in transit. The packing cases should be marked to indicate the fragile nature of the contents.

20. TYPE Testing of Meter:-

The Smart meter (WAN /NAN) should be type tested at any NABL accredited Laboratory in accordance with IS 16444with latest amendments and our tender specifications, CBIP Report 325 and IS15959 with latest amendments. The Type test report should not be more than 2 years old. The attested photocopy of the Type Test results should be enclosed with the design document submission. If there is any modification in the design / parameters of the specifications or use of constituent materials in the meters, 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. The type test reports should include meter accuracy at 120 Amp & meter performance at voltage variation of + 20 to -40%

21. GUARANTEED TECHNICAL PARTICULARS :

(Test certificates for Type Test)

The tenderer shall fill the guaranteed technical particulars in the proforma enclosed with the tender specification. The tenderer has to submit all the type test certificates from any NABL accredited laboratory for all type tests mentioned in the relevant ISS for all ratings of meters offered by them failing which the offer shall be out rightly rejected. This requirement is for both past as well as for new suppliers. The tenderer has also to give a detailed write up in 3 copies high-lighting the design feature of the meters offered by them.

22. **PERFORMANCE ON DC INJECTION** :- Apart from all the technical requirements as specified above, it should also be ensured that meter should not stop and record consumption accurately even on injection of DC voltage in neutral.

23. **ACCURACY OF METER**: - There shall be no drift in the accuracy of the meter for a period of at least 10 years from the date of supply. In case any drift is noticed, which is beyond permissible limits, the bidder shall have to recalibrate the meter for correct accuracy and if recalibration is not possible, the meter shall be replaced by a new meter without any extra cost.

24. **Non Flammability**: - The terminal bock, the terminal cover, meter base and cover shall ensure reasonable safety against spread of fire. They shall not be ignited by thermic overload of live part in contact with them. To comply with this, these parts shall fulfil the condition of the glow wire test as per clause 5.2.4 of CBIP Technical report 325.

25. **DRAWING & TECHNICAL LEAFLETS**:

Detailed dimensional drawing along with the circuit diagram and detailed technical leaflets showing clearly the quantity or the material used for meters and its constructional features should be furnished along with the offer.

26. METER READING INSTRUMENTS:

With each lot of 1000 meters, the bidders are required to supply one number Common MRI (Meter Reading Instrument)/Mobile App free of cost. MRIs should conform to technical specification given in Section III- C & minimum Guaranteed Technical Particulars given in Schedule-II-B of thistender specification. 1 Android (Android version 12 or latest) based CMRI for 20,000 meters shallbe provided by AMISP (it will be handed over to Discom along with the Set of Meters).

27. **Technical Deviation –** Any deviation in the technical specification as specified in this specification, shall be specifically and clearly indicated in the Schedule of Technical Deviation Format i.e. Schedule –V, part- “B”.

28 SAMPLE METER TESTING CLAUSE

(i) The offered meters shall be ISI marked as per relevant ISS and strictly conform to the tender specifications and should be duly type tested from any NABL accredited laboratory. The type test report should not be more than 2 years old.

(ii) Furthermore, from each lot of 1000 meters or more received against the supplies, 32 meters would be sent for necessary tests as per relevant ISS at supplier’s cost to any of the NABL accredited laboratories and the said lot would only be accepted after passing of the sample meters sent for testing.

(iii) If MPERC modifies / frames any regulation regarding testing for accepting the supplies during the finalization of instant tender / during currency period of the tender, the same would be made applicable at the cost of the supplier.

29 TESTS AND STANDARDS

29.1 Tests

The following type, acceptance and routine tests and tests during manufacture shall be carried-out on the material. For the purpose of this clause:

29.1.1 Type Tests shall mean those tests, which are to be carried out to prove the process of manufacture and general conformity of the material to this Specification. These tests shall be carried out on samples prior to commencement of commercial production against the order. The Bidder shall indicate his schedule for carrying out these tests. These tests are to be carried out at any NABL accredited laboratory.

29.1.2 Acceptance Tests shall mean those tests, which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.

29.1.3 Routine Tests shall mean those tests, which are to be carried out on the material to check requirements, which are likely to vary during production under routine tests, all acceptance tests are to be carried out on finished goods by the manufacturer after completion of the manufacturing process.

29.1.4 Tests during Manufacture shall mean those tests, which are to be carried out during the process of manufacture and end inspection by the bidder to ensure the desired quality of the end product to be supplied by him.

29.1.5 The norms and procedure of sampling for these tests will be as per relevant ISS.

29.1.6 The standards and norms to which these tests will be carried out will be as per relevant ISS and CBIP technical report-325.

29.1.7 For all type and acceptance tests, the acceptance values shall be the values specified in this Specification or guaranteed by the Bidder, as applicable.

The tests and standards for various materials / equipment has been specified in the respective volumes of technical specifications.

29.2 Testing Expenses

29.2.1 Type test charges, if any shall be borne by the bidder. The charges so incurred shall not be

reimbursed / paid by owner.

29.2.2 Bidders shall indicate the laboratories in which they propose to conduct the type tests. They shall ensure that the tests can be completed in these laboratories within the time schedule and as per the requirement of specifications guaranteed by them.

29.2.3 In case of failure in any type test the bidder is either required to manufacture fresh sample lot and repeat all the test successfully once or repeat that particular type test three times successfully on the sample selected from the already manufactured lot at his own expenses. In case fresh lot is manufactured for testing then the lot already manufactured shall be rejected. The decision of the Owner in this regard shall be final and binding on the Contractor.

29.2.4 The entire cost of testing for the acceptance test and routine tests and tests during manufacture specified in the technical specifications for materials / equipment shall be treated as included in the quoted unit price except for the expenses of the Inspector / Owner's representative.

29.3 Additional Tests

29.3.1 The Owner reserves the right of having at his own expenses any other test(s) of reasonable nature carried out at bidder's premises in, addition to the specified type, acceptance and routine tests to satisfy him-self that the materials / equipment comply with the Specifications.

29.3.2 The Owner also reserves the right to conduct all the tests mentioned in the specification at his own expense on the samples drawn from the site at bidders premises or at any other test centre. In case of evidence of non compliance, it shall be binding on the part of contractor to prove the compliance of the items to the technical specifications by repeat tests, or correction of deficiencies, or replacement of defective item all without any extra cost to the Owner.

TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate)

1. The meter box shall be weatherproof, tamper-proof and made of transparent engineering plastic conforming to IS: 11731. Type test of material is required to be furnished along with the sample.

2. The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 deg. cent.

3. Thickness of the base and cover should be at least 2 mm.

4. The overall dimensions of the box will be such that a minimum clearance of 10 mm shall be maintained from top and both sides of the meter. However, the clearance at bottom should be of 70 mm. from the meter and 25 mm from the terminal block. Besides, there should be minimum clearance of 10 mm in the front from the face of meter.

5. The top cover of the meter box should be of Hinge type having at least 2 nos. U clamps to hold the cover with base with tamper proof sealing arrangement. The cover and base shall have groove all along with the fitting edge, so that after fixing the top cover, no wire or any device can be, temporary or permanently, inserted in the box.

6. Internal hinges: A minimum of 2 nos. internal hinges/ well protected against corrosion shall be providedon left /right side of the box. The hinges of the door shall be concealed and they shall be fixed to the flangesprovided to the base and cover of the box in such a manner that the door opens by a minimum of 120degrees.

7. Meter shall be fitted with the base of box through screw or by some other better means in such a way so that once the meter is fitted with the base; it cannot be removed from the base and become an integral part with base. The meters shall be supplied duly mounted on the base of meter box.

8. Suitable circular holes with adjustable cable glands shall be provided at the bottom of the meter box for inlet and outlet of consumer's service cables. The incoming and outgoing gland shall be positioned such that they disable direct access to terminals through glands.

9. The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad / suitable push button with spring action which shall be provided on meter cover and top cover of meter box to activate the push button of meter to read parameters can be accepted.

10. The boxes shall be specific to the meter mounted in it. Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.

11. The box should have proper mounting arrangement so that it could be mounted on the wall or the pole, as the case may be. LT CT meter boxes are to be mounted on wall or pole as per requirement (For consumer or DTR)

12. The meter box comprises of base and cover shall pass the following tests;

    i) **Unbreakability test**:-
    Shall not get damage or deform while dropping from a height of 10 ft. and hammered with 2 kg Hammer to test its unbreakability.

    ii) **Boiling water test** :-
    It should pass the boiling water test as prescribed in IS:13010.

13. The overall dimensions of the meter box shall vary according to the different make of meters. However, it shall comply with the minimum requirements as described above.

14. The individual meter manufacturers shall submit the specific drawing and sample accordingly to accommodate there make meter only. In the event of order placed, the AMISP shall submit Meter Box Sample as per technical specification (as engineering plastic) before the commencement of Supply for approval.

TECHNICAL SPECIFICATIONS OF LASH WIRE POLYCARBONATE METER SECURITY SEALS

1. Seals should be made of high-quality polycarbonate material and it should not be effected by boiling water etc. The seal must be able to withstand harsh environment indirect sunlight exposure. The seal should withstand heat resistance test at least for two Hours at 147 degree Celsius.
2. The seal should be transparent clear. The seal should be of one- piece polycarbonate body consisting of capsule and locking anchor with integrated non- magnetic & noncorrosive stainless steel sealing wire.
3. Manufacturer must patent the supplied seal; so that identical seal cannot be manufactured by other manufacturer and similar type of fictitious are not available to the counterfeiters.
4. Every seal should have 20 cm long noncorrosive, non-magnetic two strand stainless steel wire (0.40/0.25mm) permanently moulded to the seal body and locking cap of seal also moulded with steel wire.
5. The seal should have high rise molded Logo of **Discom (**copy of it is enclosed) and Thermo engraved sequential unique alphanumeric 7-digit serial numbers on the main body and on the cap. The sequence serial nos, logo & color if any shall be intimated separately.
6. The serial nos. should be Thermo or Laser engraved printed in highly visible contrast such a way that the same cannot be manipulated by using any tool or by any chemical reactions. This should be distinct and can be easy to read without using lens. The locking cap should be same serial no thermo engraved printed in highly visible contrast.
7. The sealing arrangement should be such that its original position cannot be restored after any effort of tamper or breaking of the seals.
8. The sealing mechanism should be such that it can be sealed without using any pliers or tools. The sealing procedure must be fool proof and there should not any scope of pre tampering / malpractice with sealing wire while sealing.
9. Packaging: The seal should be supplied in packet of 100 seals. Each packet shall be labeled for following information.
   . Logo details
   . Serial Number Range
   . Quantity
10. Samples: Supplier shall submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals as per TS & drawing (dimensional) for approval before commencement of supply.
11. Test: Seal should be tested for following plastic properties. Test certificate from NABL accredited lab
    1. Heat resistance at 147 degree Celsius.
    2. Breaking strength seal shall be able to withstand a force of at Least 12.0 Kg
    3. Salt spray test.
    4. Boiling water test.
12. The seal should have following essential features.
    i. Tamper resistance
    ii. Heat resistance
    iii. Environmentally safe
    iv. Should withstand direct sun light & rainwater exposure

v. Tamper evident: Material must show clear sign of tampering such as dis-colourisation when material is compromised by Penetration, Drilling, cutting, bending or pulling etc.

vi. One end of the wire should be loose and other end of wire should be permanently fixed on the bottom of female body of seal.

vii. Ultraviolet ray resistant.

13. **Construction:** One piece construction comprising of polycarbonate capsule & anchor and integrally connected noncorrosive & non-magnetic 2 strand twisted stainless steel sealing wire.
Capsule : Contains and internal locking mechanism which accepts the anchor and permanently secure the sealing wire.

Anchor : The locking cap shall have double Anchors, which secures the loose end of the sealing wire into the capsule locking mechanism.

Wire : Passes through and secures the meter.

14. Marking (A) For discom
Logo of discom:

S.NO. From ---------- To ---------- to be provided on main body of seal and top cap.

Color: Clear transparent (Color Less)

On other side of main body: name of discom

Note:- Seal patent certificate shall be produced by the firms to ascertain the seals provided on the meter and with the meters are patented. The patented seals shall have mark of the patent seal manufacturer also in addition to the marking as per the above requirement.

Schedule-IV(D)

VERIFICATION / TESTING OF METERS SUPPLIED

i) On receipt of first lot in bidders Store, three (3) sample meters shall be selected for conducting Type Test for each category of meter as per relevant IS by a committee constituted by discom. For whole current smart meter (single or three phase) one additional sample shall be selected by the committee for the testing of relay/ connect-disconnect as per relevant IS. The samples so selected shall be sealed by at least 3-4 seals/stickers by the committee members. The selected samples shall be sent with complete details for type test and additional test/special tests and DLMS conformance test as per specification at CPRI, Bhopal/any third party NABL accredited **test lab. The type test charges shall be borne and deposited by the supplier."** The detailed procedure is explained hereunder.

During the pendency of Type testing and DLMS conformance test of first lot at NABL Lab, the supplier shall provide all the application software, interfaces to the utility to enable the generation of bills using CMRI data from the respective Discom's billing units.

It is also binding on the bidders to provide other information & support and software customization also in addition to above, as may be required by purchaser to achieve auto billing and analysis of data as per the provision of technical specification requirement till satisfaction and acceptance by purchaser.

The random sample testing from subsequent lot(s) of individual DI shall be subject to acceptance test at CPRI//ERTL or any third party NABL accredited laboratory at the discretion of purchaser.

ii) In case of successful type test results, supplies shall be continued. However, in case the meter(s) do not meet the requirement as per ISS Specification in type test(s), three more samples shall be selected from the supplies already received to get them type tested at supplier's cost. In case of repeat failure in type test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled.

iii) On receipt of consignment of subsequent lot in AMISP' stores, a set of 32 meters shall be selected randomly and sent to CPRI/ERTL/any third party NABL accredited laboratory at the discretion of

Discom for conducting acceptance test as per the prescribed procedure. The Cost shall be borne by the AMISP.

S. No	Particulars of tests	No. of samples to be tested
(i)	Starting Current test and No load test	32 Nos.
(ii)	AC high Voltage test, Insulation test, Limits of error, Test of meter constant, Power consumption test.	8 nos. out of above 32 Nos.
(iii)	Repeatability of error	3 nos. out of above 8 Nos.
(iv)	Voltage variation, Tamper & fraud protection, D.C. Immunity Test, Magnetic Immunity test (Permanent magnet test of 0.27 Tesla), Accuracy test after application of 440 Volts for 5 minutes, Imax for 30 minutes test, D.C. Injection test, Approx. 35 KV high voltage /high frequency burst test, remote loop induction device (jammer) test, Shock test and Fast transient burst test.	3 nos. out of above 8 Nos.

Following procedure shall be adopted to clear the tested lot:

1. Failure of any 2 nos. meters shall be allowed out of 32 nos. of meters tested at sr. no. (i) of above table. Failure of more than 2 nos. meters, the further testing shall be suspended and lot shall be declared as failed.
2. Failure of any one meter shall be allowed out of 8 nos. of meters tested at sr. no. (ii) of above table. In case of failure in more than one meter, the further testing shall be suspended and lot shall be declared as failed.
3. No failure shall be allowed out of 3 nos. of meters tested at sr. no. (iii) of above table. In case of failure of any meter, the further testing shall be suspended and lot shall be declared as fail.
4. Failure of any one meter shall be allowed out of 3 nos. of meters tested at sr. no. (iv) of above table. In case of failure in more than 1 no. meter, further testing shall be suspended and lot shall be declared as failed.

iv) In case of failure of samples of lot/ sub-lot in the test(s) detailed above, the similar testing procedure as described shall be repeated on another lot and if the lot fails consecutive second time the entire quantity of respective lot/sub-lot shall be rejected and shall have to be replaced by the supplier at his own cost. Repeated failure/poor results in the testing may render cancellation of order.

v) The supplies, at the option of Utility, may be utilized in the field during the period of testing. In case of repeat failure in Type/Acceptance Test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled. The Utility also reserves the right to accept or reject the utilised quantity in the field on the basis of the test results.

vi) The Utility also reserves the right to get additional samples for all or any of the selected tests at purchaser's cost at any independent test house at any stage of supply, if so considered necessary to ensure that the quality of meters being offered for inspection is same as already got type tested.

vii) However, the purchaser i.e. [UTILITY] may its option/ discretion may allow the supplier to re-offer the material after change/ modification in the design of meters. The balance material shall be accepted only after successful Type Testing. The Type Testing charges shall be borne by the supplier. The decision of [UTILITY] in this regard shall be final and binding on the supplier.

viii) In case of successful test results, supplies shall be continued.

ix) The decision of [UTILITY] regarding verification/ Testing of meters at CPRI or any other third party NABL accredited laboratory shall be final and binding on the supplier and the [UTILITY] shall not be required to give any reason(s) in writing or otherwise at any time for the rejection of material.

Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRELCD DISPLAY METER, CLASS 0.5s

Guideline:

1. In case of deviation in the below mentioned technical specifications from the IS as applicable then the AMISP has to comply with the IS:16444 Part-II & IS:15959 Part-III with latest amendment, wherever applicable.

(1) SCOPE & OBJECTIVE: -

(i) This specification covers design, engineering, manufacture, assembly, inspection, testing at manufacturers works before dispatch, supply and delivery at destination any where in state of Madhya Pradesh, DLMS Compliant, (**Category-'D3'**) ISI mark 3 phase 4 wire 3x240 volts - /5 Amp CT operated static tri – vector energy meter of accuracy Class 0.5s capable of primarily performing function of tariff meters. The meter should the capable to record and display active, reactive, apparent and maximum demand in active / apparent 3 phase 4 wire AC balance/ unbalanced loads for a power factor range of zero (lagging), unity and zero (leading) as per requirement given in this specification. Meters shall be supplied along with base – computer software's (BCS) as per the details given in this specification.

It is not the intent to specify completely herein all the details of the design and construction of material.

(ii) The material shall, however, conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser.

The Communication port should be as per IS 16444. AMR through optical port/ GPRS is acceptable.

(2) SERVICE CONDITIONS: -

The offered meter shall be suitable for satisfactory continuous operation as per relevant standards under the following tropical conditions: -

a)	Maximum ambient temperature	:	50ºC	
b)	Maximum ambient temperature in shade	:	45ºC	
c)	Relative Humidity		:	10 to 95%
d)	Maximum Annual Rainfall		:	1450 mm
e)	Maximum wind pressure		:	150 Kg/m^2.
f)	Maximum altitude above mean seal level		:	1000 meters
g)	Isoceraunic Level		:	50 days/year
h)	Seismic level (Horizontal acceleration)	:	0.3g	
i)	Moderately hot and humid tropical climate			

(3) APPLICABLE STANDARDS: -

Unless otherwise specified elsewhere in this specification the performance and testing of the meters shall conform to the following Indian/International standards and all related

Indian/International standards to be read with up to date and latest amendments/revision thereof: -

1	IS : 16444 (Part2)	A.C. static watt-hour meters for active energy (class 0.5s)
2	CBIP Tech Report 325	Specification for AC static electrical energy meters of CBIP New Delhi with its latest amendments.
3	IS 12063	Specification for degree of protection for enclosure.
4	*IS 15959 (Part3)*	Communication protocol

Unless otherwise specified elsewhere in this specification the static meters shall conform to the latest version available of the standard as specified above.

The equipment meeting with the requirements of other authoritative standards, which ensure equal or better quality than the standard mentioned above, shall also be considered.

In case of conflict the order of precedence shall be:

1. IS 15959 Part-I
2. Specifications as per bid document,
3. Indian Standard,
4. CBIP Technical Report No.325

In case of any difference between provisions of these standards and provision of this specification, provisions contained in the bid document shall prevail.

(4) <u>ENERGY METERS</u>: -

Meters are required for installation in the premises of LT consumers. The basic system parameters wherein these meters will be installed shall be as under: -

I	LT System voltage	3 phase 4 wire 3x240 V (Phase to neutral)
II	Voltage variation	+20% to -40%
III	Current	Ib : 5 Amp Imax : 200% of Ib
IV	Frequency variation	50 Hz ± 5%
V	Power factor	Zero lag- unity- Zero lead

The meters shall be suitable for LT CT operated system.

The following CT ratio shall be selected for the consumer

- For LTCT consumer-100/5A & 200/5A

  Categories are as follows:
  - single phase -5-30 Amp, cat D1
  - 3 phase WC-10-60 Amp,Cat D2
  - 3phase WC-20-100 Amp or Better (i.e-10-100 Amp), Cat D2
  - 3 phase LT CT- -/5 Amp, Cat D3

Please refer feeder wise and circle wise data.

Necessary survey to be carried out by AMISP

The meter shall be 3 phase 4 wire type, suitable for continuously 240 VAC (Phase to neutral) and shall be capable of withstanding twice the nominal voltage between phase to neutral (or earth) for short duration.

GENERAL TECHNICAL REQUIREMENT

Application	:	3 Phase 4 Wires
Rated Voltage	:	**240 Volts (Phase to neutral)**
Rated Current (I Basic)	:	5 Amps balanced & unbalanced load
Rated Frequency	:	**50 Hz**
Accuracy Class	:	**0.5s as per IS: 16444(Part2)**
Power factor	:	Unity to Zero (all power factor lag/or lead)
Temperature	:	The standard reference temperature for Performance shall be 27ºC. The mean temperature co-efficient shall not exceed 0.03%.

The offered meter shall start and continue to register on application of **0.1%** of basic current at Unity P.F., as per relevant standards and shall work satisfactorily up to maximum continuous current of 2 times rated basic current with the following supply system variation:

Voltage : V_{ref} + 20% to - 40%

Frequency : 50 Hz ± 5%

The meter should be ISI marked, DLMS Compliant Category 'D3'

(4.1) Power consumption: -

Voltage circuit – As per IS 16444

Current circuit – As per IS 16444

(4.2) Starting Current: -

The meter should start registering at 0.1% of Ib as per IS: 16444

(4.3) Radio interference suppression and electromagnetic capability: -

The meter shall not generate, conduct or radiated noise, which would interface with the other requirement. The above shall conform to the requirement listed in the applicable standards.

(4.4) External magnetic influence: -

The meter shall not get influenced by any external magnetic fields (AC Electromagnet or DC Magnet) as per value(s) specified in CBIP technical reports no 325 for AC magnetic field.

(4.5) Running with no load: -

When the 115% of rated voltage is applied with no current flowing in the current circuit, meter shall not register any energy and test output of the meter shall not be more than one pulse on no load as per IS: 16444.

(4.5.1) The meters shall work satisfactorily in the absence of neutral and shall work even if any two voltage wires are extended to the meter.

(4.5.2) The meter shall be designed for 5A CT secondary with 200% overloading. The meter operating software should be programmable so as to enable direct reading of energy and

other quantities on the metered (Primary) circuit for any CT ratio specified with application of any multiplying factors. However it should be as per IS 15959.

(4.5.3) Accuracy – class 0.5s

(4.5.4) The meters shall make use of Non volatile Memory capable of storing & retaining all the data required to be stored, without the help of any power source or battery back up.

(4.5.5) Computation of demand shall be on the basis of real time clock of the meter itself.

(4.5.6) Provision shall be made for the billing operation automatically at a predefined date by programming the meter. Billing shall also be possible with the press of MD reset button.

(4.5.7) The meter shall have provision to store the billing values of KWh, KVAh, KVArh and MD in KW and KVA during the month for minimum of last 12 histories. Both KW and KVA to be provided by default.

(4.5.8) Meters covered under this specification shall be fully static type with non volatile memory to register various billing parameters and complete with other features as detailed out in this specification. Any other design meeting technical specification or features/accuracy etc., better than this specification and manufactured as per relevant IEC/IS/CBIP report shall also be acceptable.

(4.5.9) Meters shall be suitable for accurate measurement and display of energy and other billing parameters within the specified limits of errors under balanced and unbalanced load conditions in a poly phase network.

(5) POWER FACTOR RANGE: -

Meters shall be suitable for measurement of billing parameters with specified accuracy for full power factor range i.e. zero lag – unity – zero lead. Meter shall be record fourth quadrant energy parameters.

(5.1) The meter shall be full programmable by the user for TOD timings and billing dates etc. For security reasons, the meter operating software should have at least “two level write protection” against any modification/editing of the parameters, data, setting etc. except those required for Billing data, TODmetering & meter shall be as per IS15959 part 3
By default, meter Shall display 4 TOD zone on display and shall be configurable. TOD timing are as follows:
TOD1: 22:00 hrs to 06:00 hrs (Next day)
TOD2: 06:00 hrs to 09:00 hrs
TOD3:09:00 hrs to 17:00 hrs

TOD4: 17:00 hrs to 22:00 hrs

(6) CALIBERATION, CONFIRGURATION & PROGRAMMING: -

The meter should be only factory calibrated, configured and programmed, No device, such as potentiometers shall be used which can result in change of calibration at site. The above activities should not be possible at site through the use of user software or any such means. It shall, however, be possible to check the accuracy in the field by means of the test output. No setting points/ setting registers etc. shall be provided for adjustment of measurement errors. The meter constants once finalized, shall be freezed and it shall not be possible by the manufacturer or the user to alter the meter constants either at factory or at site.

(6.1) Provision shall be made to read various billing parameters and tamper data recorded by meter through a meter reading instrument. This arrangement shall be through an optical port. Provision shall be made to seal the optical port to ensure proper security.

(6.2) Meters shall be designed for satisfactory operation with the following supply voltage / frequency variation: -

Voltage - V. Ref + 20% to -40%

Frequency - 47.5 Hz to 52.5 Hz (ref. frequency 50 Hz.)

For above voltage and frequency range, the meters shall measure, register and display various parameters accurately.

(7) DISPLAY PARAMETERS (On pressing of push button i.e., billing parameters):

The display shall be liquid crystal type with all display parameters available on display. There shall be 7 segments 7 digits for display of parameter value. The LCDs shall be capable of being powered on by Internal Battery and it should be activated by Pressing the Push Button to Display the Parameters in the event of power failure. The height of display unit shall be minimum 8 mm and which shall be clearly visible from distance. The meter shall have min 7 digits with '-' indication. Without indication indicates '+'. , parameter identifier, backlit Liquid Crystal Display (LCD) of minimum 10 mm height, wide viewing angle.

a) General Requirements

(I) Auto display mode

i) Date DD:MM:YY
ii) Time HH:MM
iii) Cumulative kWh
iv) MD KW and KVA
v) Instantaneous P.F with sign of Lag / lead
vi) Average PF to be provided for previous 6 months.
vii) Main Billing active KWh
viii) TOD 1,2,--,6 Billing active KWh
ix) Meter circuit/health status: Current Ckt-OK, Voltage circuit-OK
Meter health status RTC,NVM, BATTERY
MD KW and KVA(with Date &Time)
Voltage R phase
Voltage Y phase
Voltage B phase
Current R phase
Current Y phase
Current B phase
Power factor R
Power factor Y
Power factor B
MD kW and KVA (with Date & Time)

(II) Display Parameter Push Button mode

The display of the following parameters shall be continuously scrolling one after another through push button. The display shall have 'ON' time of at least 10 seconds of each measured value. The LCD segment check shall be on meter display for 10 seconds. Display parameters shall move forward if button pressed prior to the programmed time for display of each parameter.

i) LCD segment check
ii) Date DD:MM:YY
iii) Time HH:MM
iv) Rising demand register
v) MD reset count
vi) Cumulative kWh energy register
vii) Cumulative kVArh lag energy register
viii) Cumulative kVArh lead energy register
ix) Cumulative kVAh energy register
x) KW and KVA MD register
xi) Cumulative MD register KW and KVA
xii) Instantaneous P.F with sign of Lag / lead
xiii) Frequency
xiv) TOD 1,2,--,8 Cum. KWh
xv) TOD 1,2,--,8 Cum. KVAh
xvi) TOD 1,2,--,8 MD KW and KVA

xvii) Average PF to be provided for previous 6 months.
xviii) Billing MD kW and KVA
xix) Billing MD date
xx) Billing MD time
xxi) TOD 1,2,--,8 Billing MD registers
xxii) Main Billing KWh register
xxiii) TOD 1,2,--,8 Billing KWh registers
xxiv) Main Billing KVAh register
xxv) TOD 1,2,--,8 Billing KVAh registers
xxvi) Tamper information-This shall be displayed when tampered with following.

a) Date of last tamper occurrence

b) Time of last tamper occurrence

c) Number of times meter tampered

b) Programmable Optional Requirements: Meter should be as per IS15959, however the extra parameter shall be available on display.

i)	Phase wise current	-	A
ii)	Neutral Current	-	A
iii)	Phase wise Voltage	-	V
iv)	Instantaneous Power	-	KW and KVA

C) View Parameters (display/information required through MRI/BCS):

i) Vector Diagram of all 3 phases
ii) Instantaneous parameters as per table 1 of IS 15959 part3
iii) Load Survey parameters as per table 2 of IS 15959 part3; There should be provision to select which load survey parameters is to be viewed.
iv) Daily load profile as per table 3 of IS 15959 part3
v) Billing Profile parameters as per table 4 of IS 15959 part3
vi) Name plate details as per table 12 of IS 15959 part 3
vii) Programmable parameters as per table 13 of IS 15959 part3
viii) Tamper Information as per table 5 to 11 of IS 15959 part3

(8) MAXIMUM DEMAND REGISTRATION: -

Maximum demand computation shall be updated based on sliding window principle only and demand integration period of 15 minutes programmable with updates of 5 minutes for 15 minutes IP (15 Minutes block). However, meters are to be supplied as per provisions of IS 15959 Part 3. The meter shall monitor during each integration period of the month & display maximum value occurred.

(8.1) The MD integration cycle shall be on the basis of real time. However, the real time clock of the meter shall be used only for the purpose of time matching and for computation of maximum demand the internal clock of meter shall be made use of.

(8.2) Billing Rate Registers/ MD Reset: -

Each rate register shall have and associated billing register. When a billing operation occurs, the contents of the rate registers shall be transferred to their billing equivalents. The meter shall display the maximum demand reset count. Billing operation may be caused by any of the following means.

(i) Automatic Billing;-

Automatic billing operation shall also be supported. Up to 12 of these shall be able of being set up within the tariff configuration file. On each specified day the billing operation shall occur at 00:00 hrs. Billing date and time shall be programmable.

(ii) Manual Billing: -

The left – hand button on the front of the meter shall be capable of being configured for use as a maximum demand reset button by selecting the appropriate option in the tariff configuration file, pressing the left – hand button shall then cause a billing operation, which includes resetting any maximum demand registers that are in operation. Only one manual billing operation shall be possible in any given day. Subsequent presses of the left – hand button shall be ignored if a manual billing operation has already occurred on that day. Position of push button may be accepted as per design of manufacturer, however the button should be properly marked.

(9) ELECTRONIC BILLING: -

Sending a secure MD reset message to meter via the optical port shall cause a billing operation. Normally this option shall be disabled. However MD reset provision should be in line with ICS vide BIS IS 15959.

(10) CUMULATIVE DEMAND REGISTERS: -

The cumulative demand registers keep a running total of the value of maximum demand registers, and are updated each time billing occurs. Meter should be as per IS 15959.

(11) LOAD SURVEY: -

As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days.

(12) TAMPER FEATURES: -

As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment. for category 'D3' LT CT operated meter for consumer metering. The following tamper information shall be available in the meters to detect common ways of tamper & fraud.

(a) Missing Potential detection: -

The meter shall defect PT missing and record this information along with date & time of occurrence and restoration of the event and phase indication.

(b) CT reversal detection: -

The meters shall detect and indicate the occurrence of CT reversal on meters display along with phase indication and shall also store the date & time of occurrence and restoration in the non – volatile memory. Even if meter detects such a condition, the recording of KWh shall be done in positive direction only.

(c) Current/ Imbalance (CT shorting/by – passing): -

In case of CT open or shorting, which may result in the current imbalance between the phases, the tamper indication should appear by means of measuring neutral current.

(d) Power On/Off: -

Meter shall be capable of detecting and recording power off of all voltages not present. The event shall be recorded on the next power up. At the same time, power on event shall be recorded.

(e) Along with the information, the meter shall also record the instantaneous values of all three phase voltages, three phase currents, three phase power factors etc in line with ICS to elaborate the existing condition during all the type of tamper events.

(f) The meter shall record 200 events of PT Missing, CT reversal/ current imbalance (occurrence + restoration) along with date and time of occurrence and restoration of each and every event. The event recording shall be compartment – wise roll over type i.e. it shall always maintain record of last 200 events occurred (100 occurrence and 100 restoration).

(g) Phase Sequence Reversal: -

Meter shall record accurately irrespective of the phase sequence of the supply.

(h) Neutral Missing: -

The meters shall work properly even if neutral is not available and shall work satisfactorily even if any two of potential wires are extended to it (login of the same not required as applicable as per IS 15959.

Logics for design of above indicate tamper, the value of voltage, current, time etc. to be selected for design of tamper logics shall be in consultation with the purchaser. (The last tamper event as per above tamper is to be included in the DISPLAY and rest of the details in VIEW PARAMETERS).

The meters shall work properly even if neutral is not available and shall work satisfactorily even if any two of potential wires are extended to it. The meter shall work properly in the absence of both incoming and outgoing neutral. Meter should be immune to the neutral missing & the recording should not be get affected in absence of both incoming & outgoing neutral.

(i) Current present but voltage missing: - (separate OBIS code can be provided for current without voltage tamper) - Tamper logic shall be finalized at the time of final purchase order and provided by Discom:

For proper recording of the meters in case there is current Ix (equal to or more than 2% Ib) in a phase even if reference voltage of that phase is Vx (equal to or less than 50% of V rated) then in such a case meter should record energy = V rated X Ix (taking u.p.f.).

In actual field conditions, there are cases where the meter has to work under single wire condition. Event shall be recorded. It shall work on single wire condition and event shall be recorded in the meter with date and time.

(12.1) Provision shall be made for push button to initiate display parameter in the form of the meter.

(12.2) Provision shall be made for maximum demand (MD) reset push button with provision of sealing.

(12.3) An operation indicator in the form of blinking visible signal shall be provided to indicate that the meter is operating satisfactorily. Manufacturer may confirm whether the blinking visible single is of weighted pulse and this can be effectively used for verification of accuracy.

(12.4) Meters shall be programmed for auto display of billing parameters with provision of: -

- 15 seconds time display of each billing parameters
- Display cycles shall be continuous.

(12.5) Tamper information shall remain on display, unless authentic command is received. However, meter should be as per IS 15959. Once the tamper occurs same shall be sent to HES-MDM as well as available on meter display. However, tamper information should disappear from display once condition for restore is met. Tamper snapshot shall be as per relevant IS-16444 & IS-15959.

(12.6) Meter shall record the value of neutral current also at the time of occurrence of current open, current short, current imbalance temper. Manufacturer specific OBIS code in consultation with utility may be decided. OBIS code may be given. AS PER TS , OBIS CODE FOR NEUTRAL CURRENT TO BE DEFINED BY BIDDER AND OBTAIN APPROVAL FROM DISCOM.

(13) <u>BILLING POINT REQUIREMENT</u>: -

The predefined date and time for registering the billing parameters of KWh, KVAh, PF and KW and KVA MD as well as Tamper count and power – On hours readings shall be 00:00 hours of the first day of each calendar (billing) month. Cumulative Power failure duration should be provided. Both KW & KVA MD to be provided on Power Off. However meter should be as per IS 15959 category 'D3' meter. All billing parameters shall be transferred to billing registers and shall be displayed on auto cyclic display mode referred to as "BILLING PARAMETERS". Provision should be available for software to change billing point date & time. Both current and billing KW and KVA MD shall be available in power off condition. Battery mode IN THE POWER OFF CONDITION KWH AND KVA & KW MD MUST BE RETAINED IN THE METER

The above billing data, TOD register's data, load survey data, tamper information and instantaneous parameters data shall be retrievable through the meter's communication port through a common meter reading instrument (CMRI) and shall be transferred (downloaded) to a PC with windows based software to get complete details in numerical and /or graphic form. The necessary base computer software (BCS) for this purpose shall be provided by the supplier with complete details. Meter should be as per IS 15959.

Further, apart from instantaneous parameters like voltage, current, PF, readings of billing parameters, energy registers, TOD registers etc. the following additional parameters should be made available at the BCS end:

(a) MD reset count.

(b) Billing parameters for last 12 Histories.

(14) (i) <u>MAGNETIC INFLUENCE</u>: -

If the magnetic influence affects the meter functionality, then the meter shall be capable of detecting and recording of presence of abnormal magnetic influence near the meter.

(ii) Application of abnormal voltage/frequency:

A) The accuracy of the meter should not be affected with the application of abnormal voltage/frequency such as spark discharge of approximately 35KV in any of the following manner for 10 minutes:

i) On any of the phases or neutral terminals
ii) On any connecting wires of the meter
iii) Voltage discharge with 0-10 mm spark gap
iv) At any place in load circuit
v) Spark on meter body.

Remark: Test should be apply when meter with communication module is placed inside of

meter box and without communication module when meter is placed outside of meter box and meter should be immune in both condition.

Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and for conformance criteria of energy meter with 35 KV spark device/jammer test guideline as per CBIP-325 appendix-J should be followed".

Note:

1. The measurement by meter shall not get influenced by injection of AC Voltages/ chopped signal/ DC signal and harmonics on the outgoing leads of the meter or if get affected it will log the ND event & do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within ±3% as per Indian Standard.

   When AC voltage chopped in neutral circuit and the meter voltage increases above 300 V, Meter will do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. Recording and indication of tamper(ND) must occur under this condition.

2. The meter shall not get affected by any remote device / jammer. As per Ts (Jammer test/35 KV spark may be performed in two condition 1. when NIC card is placed in meter and meter is mounted inside of meter box as per actual field condition 2.On the meter without NIC card and meter is outside of meter box). Remote device means any electrical or electronic or electromechanical or any other equipment

   Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and for conformance criteria of energy meter with 35 KV spark device/jammer test guideline as per CBIP-325 appendix-J should be followed.

3. The bidder should furnish detailed explanation as to how the meter is able to detect/ protect recording the above tamper and fraud features with sketches and phaser diagram. Additional features, if any, in the meter may also be clearly indicated. Meter should be immune.

(15) PERFORMANCE ON DC INJECTION: -

Apart form all the technical requirements as specified above, it should also be ensured that meter should not stop and record consumption accurately even on injection of DC voltage in neutral or if get affected it will log the ND event & do deficiency metering and accuracy will be within ±3% as per Indian Standard.

When DC is injected in neutral circuit and the meter voltage increases above 300 V, Meter will do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. Recording and indication of tamper must occur under this condition.

(16) TOD TARIFF / DEMAND: -

The meter should be capable of registering the time – of - day energy and maximum demand. The time - zones shall be provided at the time of ordering.

The meter should have in – built capacity to define up to eight time zones. The change of the TOD time – period (S) or defining additional TOD zones should be possible through CMRI with special authenticated command from the BCS and Remote command from HES so that only authorized person (S) can make such changes. The main control of this system along with proper security password / code should be available on one or more computers located at the authorized. The default TOD Timings shall be –

Register 1- 2200Hrs. to 0600 Hrs

Register 2- 0600 to 1800 Hrs and

Register 3- 1800 Hrs to 2200 Hrs.

It should be possible to change the time period for all these eight registers through the hand held meter reading device. The main control for this change should be available on the computer located at the metering office. (The meter should be able to record energy consumption up to the specified time of day (as programmed) to help conducting regular energy balance study).

16.1 Provision should be made for automatic reset of max demand at the end of pre-defined period (say for eg. Beginning of month, every 16th of month, end of the month etc). This feature can be enabled or disabled at USER end. By default the automatic reset of max demand shall be disabled. The billing parameters at the time of reset of the max demand (manual / automatic) along with one previous record of MD Reset shall be stored and display shall be possible on demand in meter. Period as to when automatic reset of max demand is required shall be programmable. In addition, reset of maximum demand shall also be possible through push button or through an hand held terminal capable of communicating with the meter. In every case the design shall include provision of updation of cumulative demand register with updation of reset counter as per IS 15959. The record of 12 previous MD resets should be available in the memory of the meter to be made available at the BCS end by downloading through MRI. However provisions should be as per IS 15959. MD reset through push button is required.

16.2 Necessary compatible meter application software for various programmable features as discussed above in the meter and also necessary software for the compatible computer to obtain various details as discussed above shall be provided by the supplier. No separate cost will be borne by the purchaser on this account.

(17) DATA SECURITY: -

The data transfer from the meter to MRI and MRI to computer should be fully secured and any unauthorized change in data should be indicated on computer system. There should be multi lever password on the base computer system and in the meter to prevent any unauthorized change of TOD timings or resetting of demand, reading of meter etc.

(18) A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. In case of internal battery separate battery for RTC & for display during power outage should be used. The information of meter including integration etc. shall be independent of requirement of battery. The minimum life of lithium battery should be seven years.

(18.1) Under battery weak condition an indication shall appear on the meter display and flag with self-diagnostic feature shall be logged in meter and should be shown at BCS end. As per Contract agreement, it is required for MRI and testing work

Under battery weak condition an indication shall appear on the meter display and flag with self-diagnostic feature shall be logged in meter and should be shown at HES/BCS end. As per Contract agreement, it is required for MRI and testing work

Under battery weak condition an indication shall appear on the meter display and flag with self diagnostic feature shall be logged in meter and should be shown at HES/BCS end

(19) OUTPUT DEVICE: -

The meters shall have a test out put in the form of a blinking LED for testing of the meters accuracy. Testing shall also be possible through optical port accessible from the front and can be monitored with meter reading instrument having high resolution display.

The meters shall give high resolution energy values directly to meter reading instrument. The resolution will be sufficient to enable conduction of the starting current and accuracy test in less time.

(20) <u>COMMUNICATION PORT</u>: -

The LT CT operated meter for consumer metering should be DLMS Compliant open protocol conforming to IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment. for category 'D3' & Indian Companion Standard.

The energy meter shall have a galvanically isolated optical communication port, so that it can be easily connected to hand held common meter reading instrument for data transfer to or from meter reading instrument with proper security and without error OR subsequently hooked to a remote metering device. The optical port shall be located in front of the meter and shall have adequate sealing arrangement to seal it. Serial communication protocol shall be adopted for data communication. In the forthcoming paragraphs requirement of a D-port telemetering purpose has been described. Meters covered under this tender will be employed for metering at the premises of LT consumers for tariff application. The instantaneous parameters load survey data and tamper information etc. will be monitored remotely through computer installed in central station. The data from meter will be transferred to the central station through any communication links as meter are required to be completed with capability of remote meter reading. It will be obligatory on the part of the bidders to supply the software in adequate copy needed for remote meter reading. No separate cost towards remote meter reading software using any communication technology will be born by the purchaser. The meters shall be compatible for AMR using any communication network. The communication port shall be as per IS 16444.

20.1.1 A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. In case of internal battery separate battery for RTC & for display during power outage should be used. A Lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The meter shall perform satisfactorily without any requirement of external Lithium battery even under power off condition.

20.1.2 Under battery weak condition an indication shall appear on the meter display and flag with self diagnostic feature shall be logged in meter and should be shown at BCS end. The life of the lithium battery for supplying energy to real time clock during no voltage or power off condition would not be less than 10 years. As per Contract agreement, it is required for MRI and testing work

Under battery weak condition an indication shall appear on the meter display and flag with self-diagnostic feature shall be logged in meter and should be shown at HES/BCS end.

20.1.3 Output device: The meters shall have a test out put in the form of a blinking of LED for testing of the meters accuracy. Testing shall also be possible through optical port accessible from the front and can be monitored with meter reading instrument having high resolution display.

The meters shall give high resolution energy values directly to meter reading instruments. The resolution will be sufficient to enable conduction of the starting current and accuracy test in less time.

20.1.4 Meters shall have provision for testing of meters in the meter testing laboratory or testing of meters at site with the help of electronic substandard meters and phantom load test set. (In order to reduce the testing time of meter particularly for verification of demand suitable facility shall be provided through meter reading instrument).

20.1.5 Meter shall operate and record satisfactorily independent of phase sequence of input supply so long as phase association between voltage and current circuit is in order.

20.1.6 The performance of meter should not be affected by the external electromagnetic interference such as Electrical discharge of cable and capacitor, harmonics, electrostatic discharges, external magnetic filled and injection of DC current in AC circuits etc.

20.1.7 The basic meter shall be designed for overloading up to 200%.

20.1.8 No setting point/ setting register etc, shall be provided for adjustment of measurement errors.

(20.2) A Lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The meter shall perform satisfactorily without any requirement of external Lithium battery even under power off condition.

(20.3) Under battery weak condition an indication shall appear on the meter display and flag with self-diagnostic feature shall be logged in meter and should be shown at BCS end, The life of the lithium battery for supplying energy to real time clock during no voltage or power off condition would not be less than 10 years. As per Contract agreement, it is required for MRI and testing work

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(20.4) Output device: The meters shall have a test out put in the form of a blinking of LED for testing of the meters accuracy. Testing shall also be possible through optical port accessible from the front and can be monitored with meter reading instrument having high resolution display

(21) CONSTRUCTION OF THE METER: -

The components on the PCB shall be of surface mounted to ensure reliable performance even under shock / vibration.

Body of the meter shall be designed suitable for projection mounting. The meter should be made of high quality raw materials to ensure higher reliability and longer life. The meter should be compact and reliable in design e.g. to transport and immune to vibration and shocks involved in transportation / handling. The construction of the meter shall be suitable for its purpose in all respects and shall give assurance of stable and consistent performance under all conditions especially during dust storms/heavy rains/ very hot days. The meter shall conform to IP – 51 according to IS – 12063.

All insulating material used in the construction of the meter shall be non – hygroscopic non ageing and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion. The construction of the meter shall be such as to be sealed independently and prevent unauthorized tampering.

Meters described above shall be installed in consumer premises outdoors inside a meter box, directly under the sun and extreme weather conditions. Suitability of such use shall also be confirmed. Fixing clamps, bolts and all other arrangement is within the scope of AMISP

(21.1) Meter Case: -

The meter shall have a case, which can be sealed in such a way that the internal parts of the meter are accessible only after breaking two sets of seals, one that of terminal cover and the other of the meter cover. The meter shall be made of self extinguishing polycarbonate / Engineering plastic. The case shall be so constructed and arranged that any non permanent deformation can not prevent the satisfactory operation of the meter. Color of Meter : **Meter Base (Grey /Black/Opaque), Top Cover (Transparent/Opaque/ Translucent), Module Cover (Translucent / opaque/ Transparent). The Terminal Cover must be transparent with wire entry cut**.

(21.2) Terminals & Terminal Block: -

The meter shall have Ni plated brass terminals and the holes in the insulting material, which form and extension of the terminal holes, shall be of minimum 5.5 mm. to accommodate the insulation of the conductors and shall be of adequate length in order to have proper grip of conductors/crimping pins with the help of two screws, such that there is no risk of loosening of undue heating. Screw connections transmitting contract force and screw fixing which may be loosened and tightened several times during the life of meter shall be such that the risk of corrosion resulting form contact with any other metal parts is minimized, Electrical connections shall be so designed that contact pressure is not transmitted through insulating material. For current circuit, the voltage is considered to be the same as for the related voltage circuit. The terminal block shall

satisfy all the conditions such as clearance and creepage distance between terminals and surrounding part of the meter as specified in relevant clause of CBIP technical report 325.

(21.3) Terminal Block Cover: -

The terminal block cover for the meter shall be extended transparent type which can be sealed independently & over the meter cover. The terminal cover shall enclose the actual terminals, the conductor fixing screws and 10 mm of the external conductors and their insulation for which the terminal cover shall be of extended type. The terminals shall not be accessible without removing the seals of the terminal cover when energy meter is mounted on the meter board.

(21.4) Insulation: -

The meter shall have durable and substantially continuous enclosure made of wholly insulating material, including the terminal cover, which envelops all metal parts with the exception of small parts and should withstand and insulation test at 4 KV.

(21.5) Resistance To Heat And Fire: -

The terminal block and the meter case shall ensure reasonable safety against the spread of fire. These should not be ignited by thermal overload of live parts in contract with them.

(22) SEALING OF THE METER: -

(22.1) The meters should software calibrated at factory and sealed suitably before dispatch Proper sealing arrangements shall be provided on the meter to make temper proof and mishandling by unauthorized person.

(22.2) At least, two(2) seals on the body ,two Nos. temper evident sticker seals (of minimum size 15 mmx30mm)between the base and cover of the meter body shall be provided. All the seals should be provided on front side only. Rear side sealing arrangement will not be preferred. **Provision for providing 02 Nos. seals on the terminal block, one seal on MD resetting button & one seal on optical communication part shall be provided.** MD reset through push button is essential during testing and as an alternative.

The meter body sealing screw shall be provided with good quality 6 digit Numbered polycarbonate seals are any superior body sealing arrangement with embossing on sides, one side with the logo of the firm and other side “[UTILITY]”. The Nos of the seals shall be unique and should not be repeated in any case.

The polycarbonate seals shall have proper locking to avoid opening of the seal in any case by means of tempering.

(22.3) The poly carbonate meter body, the cover shall be permanently ultrasonically welded with the base. All meters shall be sealed by the manufacturer at its works.

The meter shall be encapsulated designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design.

A tracking and recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal

Only the patented seals (seals from the manufacturer who has official right to manufacture the seal) shall be used.

Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seals shall be used.

Lead seals shall not be used in the new meters.

(23) CONNECTION DIAGRAM & TERMINAL MARKING: -

The connection diagram of the meter shall be clearly shown on inside portion of terminal cover & shall be of permanent nature. Meter terminals shall also be marked & this making should appear in the above diagram. CONNECTION DIAGRAM IS AVAILABLE ON T-COVER

The holes for sealing wire may be of 2mm. One hole should be provided in the head and one in the threaded portion.

Meter shall have a name plate clearly visible effectively secured against removal and indelibly and distinctly marked with all the essential particulars as per relevant standards i.e.

(a) Manufacturer's name and trademark

(b) Manufacturer's serial number

(c) Type and description

(d) Accuracy Class

(e) Rated current, voltage and frequency

(f) Relevant ISS/CBIP No. should be printed along with ISI mark**.**

(g) Principal unit of measurement

(h) Manufacturer's meter constant shall invariable be clearly indicated.

(i) Name of the owner, purchase order No. and date and month /year of manufacturing as indicated below, suitably abbreviated, shall be printed: -

Owner – [UTILITY]	P.O. No. & date	Month & year of manufacture

(24) INSTALLATION CHECK: -

While installing the meter, it shall be possible to check the correctness of the connection to the meters and their polarity forms the functioning of the meter with the help of CMRI under load condition. The phase sequence and phased association of voltage and current can be checked with the help of CMRI.

(25) TESTS & INSPECTION: -

(25.1) Acceptance Test: -

All acceptance test as per IS: 16444 and CBIP-325 (Technical Report) with latest amendments shall be carried out on the meter.

(25.2) Routine Test: -

All routine test as per IS: 16444 and CBIP-325 (Technical Report) with latest amendments shall be carried out on the meter.

(25.3) Pre – Dispatch Inspection: -

All acceptance tests and inspection shall be carried out at the place of manufacturer unless otherwise specially agreed upon. The [utility] representative/ Engineer attending the above testing will carry our testing as per IS: 16444 and CBIP-325 (Technical Report) with its latest amendments and as per this specification.

(26) AFTER SALES SERVICE: -

In order to provide prompt & smooth after sales support / service etc. it shall be preferred to post /engage and engineer/ technician at discom area by the manufacturer, who shall be fully conversant with the manufacturers meters, to attend any minor defects immediately & to educate the users about proper installation of meter and programming of MRI, Base computer, taking reading, billing data, load survey, tamper information etc. through MRI & download to PCs to get printouts etc.

(27) QUALITY ASSURANCE IN MANUFACTURING / TESTING: -

(27.1) Manufacturing Activities: -

Quality should be ensured at the following stages: -

(a) At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.

(b) At insertion stage, all components should undergo computerized testing for conforming to design parameters and orientation.

(c) Complete assembled and soldered PCB should under go functional test using automatic test equipments (ATEs).

(d) Prior to final testing and calibration, all metes shall be subjected to aging test i.e. meters will be kept in ovens for 72 hours at 55^0 C temperature and atmospheric humidity under real life condition at its full load current. After 72 hours meters should work satisfactorily to eliminate infant mortality.

(e) The calibration of meters shall be done in house.

(f) The bidders should submit the list of all components used in meter along with the offer.

(27.2) Minimum Testing Facilities: -

Manufacturer should posses fully computerized meter test bench CBIP 325 report. In addition to this, facility should be there to produce test reports for each and every meter. The manufacturer should have the necessary minimum testing facilities for carrying out the following tests.

(i) A.C. Voltage test

(ii) Insulation resistance test

(iii) Test on limits of errors

(iv) Test of starting constant

(v) Test of starting condition

(vi) Test of no load condition

(vii) Repeatability of error test

(viii) Test of power consumption

(ix) Vibration test

(x) Tamper condition – as per discom specification

(ix) The manufacturer should have duly calibrated ESS meter of class 0.1 accuracy or better.

(28) PACKING: -

(28.1) With each meter suitable 10 Nos. copper lugs matching with terminal hole size shall be provided.

(28.2) Each meter may be suitably packed in the first instant to prevent ingress of moisture and dust then suitable number of meters will be placed in cushioned carton of a suitable material to prevent damage due to shocks during transit. The lid of the carton may be suitably sealed. Each meter should be packed in a separate cushioned carton. The supplier shall be responsible for any damage to the equipment during transit, due to improper and inadequate packing. Any material found short inside the packing cases shall be supplied immediately by supplier without any extra cost.

(28.3) Each consignment shall be accompanied with a detailed list containing the following information: -

(a) Name of the consignee

(b) Details of consignment

(c) Destination

(d) Total weight of consignment

(e) Handling and packing instruction

(f) Bill of material indicating contents of each package

(28.4) The packing shall be done as per the manufacturer's standard practice. However, he should ensure the packing is such that, the material should not get damaged during transit by Rail / Road.

(28.5) The marking on each package shall be as per the relevant Standards.

(29) TYPE TEST CERTIFICATES:-

The meters supplied must be manufactured exactly as per the type test certificates submitted with the offer.

The Smart meter (WAN /NAN) should be type tested at any NABL accredited Laboratory in accordance with IS 16444 with latest amendments and the tender specifications, CBIP Report 325 and IS15959 with latest amendments. The Type test report certificate should not be more than 5 years old as on date of opening of bid.

(30) DRAWING & TECHNICAL LEAFLETS :-

Detailed dimensional drawing along with the circuit diagram and detailed technical leaflets showing clearly the quantity or the material used for meters and its constructional features should be furnished by the manufacturer.

VERIFICATION / TESTING OF METERS SUPPLIED

i) On receipt of first lot in Bidders Store, Three (3) sample meters shall be selected for conducting Type Test from the first lot of meters received in bidders stores by a committee constituted by Discom The samples so selected shall be sealed by at least 3-4 seals/stickers by the committee members. The selected samples shall be sent with complete details for type test and additional test/special tests and DLMS conformance test as per specification at CPRI, Bhopal /any third party NABL accredited **test lab. The type test charges shall be borne and deposited by the supplier."** The detailed procedure is explained hereunder.

During the pendency of Type testing and DLMS conformance test of first lot at NABL Lab, the supplier shall provide all the application software, interfaces to the utility to enable the generation of bills using CMRI data from the [UTILITY] billing system units.

It is also binding on the bidders to provide other information & support and software customization also in addition to above, as may be required by [UTILITY] to achieve auto billing and analysis of data as per the provision of technical specification requirement till satisfaction and acceptance by [UTILITY].

The random sample testing from subsequent lot(s) of individual DI shall be subject to acceptance test at CPRI//ERTL or any third party NABL accredited laboratory at the discretion of Discom.

ii) In case of successful type test results, supplies shall be continued. However, in case the meter(s) do not meet the requirement as per ISS Specification in type test(s), three more samples shall be selected from the supplies already received to get them type tested at supplier's cost. In case of repeat failure in type test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled.

iii) On receipt of consignment of subsequent lot in Area Stores, a set of 32 meters shall be selected randomly and sent to CPRI/ERTL/any third party NABL accredited laboratory at the discretion of Discom for conducting acceptance test as per the prescribed procedure. The Testing charges shall be borne by the bidder.

S. No	Particulars of tests	No. of samples to be tested
(i)	Starting Current test and No load test	32 Nos.
(ii)	AC high Voltage test, Insulation test, Limits of error, Test of meter constant, Power consumption test.	8 nos. out of above 32 Nos.
(iii)	Repeatability of error	3 nos. out of above 8 Nos.
(iv)	Voltage variation, Tamper & fraud protection, D.C. Immunity Test, Magnetic Immunity test (Permanent magnet test of 0.27 Tesla), Accuracy test after application of 440 Volts for 5 minutes, Imax for 30 minutes test, D.C. Injection test, Approx. 35 KV high voltage /high frequency burst test, remote loop induction device (jammer) test, Shock test and Fast transient burst test.	3 nos. out of above 8 Nos.

Following procedure shall be adopted to clear the tested lot:

1. Failure of any 2 nos. meters shall be allowed out of 32 nos. of meters tested at sr. no. (i) of above table. Failure of more than 2 nos. meters, the further testing shall be suspended and lot shall be declared as fail.
2. Failure of any one meter shall be allowed out of 8 nos. of meters tested at sr. no. (ii) of above table. In case of failure in more than one meter, the further testing shall be suspended and lot shall be declared as fail.
3. No failure shall be allowed out of 3 nos. of meters tested at sr. no. (iii) of above table. In case of failure of any meter, the further testing shall be suspended and lot shall be declared as fail.
4. Failure of any one meter shall be allowed out of 3 nos. of meters tested at sr. no. (iv) of above table. In case of failure in more than 1 no. meter, further testing shall be suspended and lot shall be declared as fail.

iv) In case of failure of samples of lot/ sub-lot in the test(s) detailed above, the similar testing procedure as described shall be repeated on another lot and if the lot fails consecutive second time the entire quantity of respective lot/sub-lot shall be rejected and shall have to be replaced by the supplier at his own cost. Repeated failure/poor results in the testing may render cancellation of order.

v) The supplies, at the option of Utility, may be utilized in the field during the period of testing. In case of repeat failure in Type/Acceptance Test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled. The Utility also reserves the right to accept or reject the utilised quantity in the field on the basis of the test results.

vi) The utility also reserves the right to get additional samples for all or any of the selected tests at Utility's cost at any independent test house at any stage of supply, if so considered necessary to ensure that the quality of meters being offered for inspection is same as already got type tested.

vii) However, the purchaser i.e. [UTILITY] may its option/ discretion may allow the supplier to re-offer the material after change/ modification in the design of meters. The balance material shall be accepted only after successful Type Testing. The Type Testing charges shall be borne by the supplier. The decision of [UTILITY] in this regard shall be final and binding on the supplier.

viii) In case of successful test results, supplies shall be continued.

ix) The decision of [UTILITY] regarding verification/ Testing of meters at CPRI or any other third party NABL accredited laboratory shall be final and binding on the supplier and the [UTILITY] shall not be required to give any reason(s) in writing or otherwise at any time for the rejection of material.

GUARANTEED TECHNICAL PARTICULARS

ISI MARK, ACCURACY CLASS 0.5s, LT C T OPERATED, DLMS COMPLIANCE CATEGORY – D3, THREE PHASE FOUR WIRE, ELECTRONIC TRIVECTOR ENERGY METERS

Sr. No.	Item	Minimum requirement	Bidder's Data
1.	Name of manufacture		
2.	Model		
3.	Standard Applicable	IS:14697/IS 16444 Part 2 (2017) and CBIP report 325 with latest amendments DLMS Complaint as per IS 15959	
4.	Rating		
	(i) Accuracy class	**0.5s As per** IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
	(ii) Rated voltage	240 V (phase & Neutral) (- 40% TO +20 %)	
	(iii) Rated current	Ib-5 A (Basic Current), Imax 200% of Ib	
	(iv) Rated frequency	50 Hz ± 5%	
	(v) Power factor	0^0 log to unity to 0^o lead	
	(vi) Max. loading to work within accuracy	**200 % of Ib (10 Amp)**	
	(vii) Minimum saturation current	As per IS 16444	
	(viii) Magnetic immunity	As per CBIP- 325 with latest amendment	
5.	(i) Continuous current rating	5 Amp	
	(ii) Running with no load & 115% rated voltage	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
6.	Short time over current	As per IS 16444	
7.	Meter shall start and continue to register at current (unity PF)	**0.1% of Ib as per** IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
8.	Power loss at rated frequency & reference temperature		
	(i) Current circuit at rated current per phase	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	

Sr. No.	Item	Minimum requirement	Bidder's Data
	(ii) Voltage circuit at rated current per phase	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
	(iii) Meter load on PTs	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
9.	Momentary over voltage	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
10.	Dielectric voltage with stand	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
11.	Communication port	2 nos. galvanically isolated optical port i.e.,. 1 NO galvanically isolated optical port for load survey facility etc. Optical Port and NIC Module will be provided in meter	
12.	Life of RTC Battery	10 years	
13.	Type of material used		
	(a) Material		
	(i) Base	Engineering Plastic	
	(ii) Terminal block	Engineering Plastic	
	(iii) Meter cover	Self-extinguishing poly carbonate	
	(iv) Terminal cover	Transparent type Engineering plastic	
	(v) Screw	Tin / Nickle plated- Brass	
	(b) Thickness		
	(i) Base	2 mm	
	(ii) Terminal block	2 mm	
	(iii) Meter cover	2 mm	
	(iv) Terminal cover	2 mm	
	(v) Screw	5-6 mm dia	
	Note:-	**Meter cover should be ultrasonically welded with base as per specification.** **The meter shall be encapsulated designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design**	

Sr. No.	Item	Minimum requirement	Bidder's Data
14.	Size of Terminal Hole	Minimum 5.5 mm	
15.	Transducers		
	(i) Input	CT & PT	
	(ii) Output	7 digit, 7 segment LCD display with backlit	
	(iii) Accuracy	**0.5s**	
16.	Type of display	LCD	
	(i) No. of Digits display	7 digit, 7 segment LCD display with backlit, high resolution display having at least 5 decimals digits	
	(ii) Character size of display	Approximate 10 mm	
17.	Fixing / Sealing arrangement		
	(i) Fixing of meter	As per TS	
	(ii) Sealing of meter body	---------Do---------	
	(iii) Type of meter body	---------Do---------	
	(iv) Sealing of terminal cover	---------Do---------	
	(v) Sealing of maximum demand device	---------Do---------	
	(vi) Sealing of communication port	---------Do---------	
	(vii) Whether meter cover is ultrasonically welded with base	The meter shall be encapsulated designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design	
18.	Type of terminal cover		
19.	Performance meter in tamper condition	Comply as per TS	
	~~(i) Phase-neutral interchanged~~		
	(ii) Main & load wire are interchanged		
	~~(iii) Load is not terminated back and current is drawn through local earth either fully or partially~~		
	(iv)Phase sequence reversal		

Sr. No.	Item	Minimum requirement	Bidder's Data
	(v)Without neutral and in absence of any two phases or even with earth	Comply as per TS	
	(vi) In presence of any two phases (any one of the phase is missing) and current is drawn through local earth, under condition when both incoming and outgoing neutral of meter is missing		
	(vii) Indication for tamper conditions	---------Do---------	
	(a) Phase-neutral interchanged	---------Do---------	
	(b) Main & load wire are interchanged	---------Do---------	
	(c) Load is not terminated back and current is drawn through local path	---------Do---------	
	~~(d) Earth loading earth indication~~	---------Do---------	
20.	Suitability of meter to sustain over voltage i.e. phase to phase voltage injected between phase & neutral	As per IS 14697	
21.	Size of calibration LED & colour		
22.	Electromagnetic compatibility EMI/EME severity level	Shall withstand EMI – EMC level –IV as per LEC 801 as per as per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
23.	Effect on accuracy of external electromagnetic interference of electrical discharge, external magnetic field & DC current in AC supply or in neutral	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
24.	Effect of accuracy in tamper condition	Comply as per TS	
25.	Cut off voltage at which meter stop working	Cut off voltage (at which meter stop working) shall be below 40% of the rated voltage (Vref)	
26.	If there is current Ix (equal to or more than 2% Ib) in a phase even if reference voltage of that phase	In such a case meter should record energy = V rated X Ix (taking u. p. f.)	

Sr. No.	Item	Minimum requirement	Bidder's Data
	is Vx (equal to or less than 50% of V rated)	(The measurement for the affected phase will start at Vref, Actual Current in that phase and UPF after persistence time of 5 Minutes. And the tamper shall be recorded as Current without Voltage Tamper with time stamping and KWH reading) As there is no OBIS code for current without voltage tamper, the logging of missing potential tamper instead of current without voltage tamper is excepted.	
27.	Input voltage & frequency variation within which meter works satisfactory	+20% - 40% V_{ref} ±5% 50 Hz	
28.	Relative humidity	Maximum 95%	
29.	Reference temperature	27^0C	
30.	Temperature range of operation	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
31.	Drift in accuracy of measurement with time	Accuracy should remain within the accuracy class	
32.	Fixing arrangement of name plate	Meter rating plate will be fixed inside the meter cover and clearly visible form the window provided for display as per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
33.	Approximate weight of meter		
34.	Type of body	Projection type	
35.	Guaranteed life of meter	Manufacturer Shall undertake a guarantee to replace meter with NIC up to Contract period (Execution + AMC). The meter which are found defective /inoperative at the time installation or become inoperative/defective within the guarantee period, these defective/ inoperative meters shall be replaced within one month of receipt of report for such defective/inoperative meters	
36.	Communication Protocol Standard	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
37.	Starting Current	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	

Sr. No.	Item	Minimum requirement	Bidder's Data
38.	Limits of error	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
39.	Influence Quantities	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
40.	Power Consumption of meter excluding communication module	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment. Power consumption of communication module shall be as per IS 16444:2015 IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment	
41.	Current and pressure Coil	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
42.	Test output device	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	
43.	Time of Use (In case of net-meter both export & import parameters to be measured)	Should support at least eight (8) Time of day tariff registers with programmable time zones and storage of billing parameters (kW, kVA, kWh & kVAh)	
44.	Parameters (Without net-metering)	• Instantaneous parameters: As per category D3 meters according to IS 15959:2017 Part 3 • Billing parameters: As per category D3 meters according to IS 15959:2017 Part 3 • Load survey / Interval data parameters: As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in	

Sr. No.	Item	Minimum requirement	Bidder's Data
		first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. • Last 6 month billing parameters are required as per IS 15959 part3. • The billing parameters shall be retained in the meter for 12 months and should automatically rollover.	
45.	Parameters (With net-metering)	• Instantaneous parameters: As per category D3 meters according to IS 15959:2017 Part 3 • Billing parameters: As per category D3 meters according to IS 15959:2017 Part 3 • Load survey / Interval data parameters: As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. • Last 6 month billing parameters are required as per IS 15959 part2. • The billing parameters shall be retained in the meter for 12 months and should automatically rollover.	
46.	Power Quality Information	• Logging of quality of supply events like power on/off, over/under voltage, over current (50 events) • Setting of Under/ Over Voltage and Over current shall be configurable.	

Sr. No.	Item	Minimum requirement	Bidder's Data
		Programmable Parameters shall be provided as per DLMS IS 15959 Part 3 for Category D3.	
47.	Maximum Demand	Should have Maximum Demand registers kW and kVA with integration period 15 minutes. It should be programmable for 30/15 minutes. Resets should be auto-monthly as well as through HES. MD Recording should be based on sliding window principal with default MD integration Period 15 Min	
48.	Load Survey/Interval Data	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. By default, LS parameters shall be with 15 Min. integration period. In addition to that Instantaneous parameter (IP data) shall also be captured on every 15 min interval at HES level.	
49.	LED/LCD Indicators	LED indicator for pulse/kWh. LED/LCD indicator for tamper, current reversal (not for net-metering).	
50.	Tamper/Event recording	As per IS 15959 Part-3 (2017). 200 events shall be stored in local memory of meters. (100 occurrence and 100 restoration)	
51.	Alarm	Alarm for power on/off (on restoration of power), Under Voltage, Over Voltage, Over Current, malfunctioning of diagnostic events shall be generated and communicated to the HES immediately.	
52.	Measuring Elements	Meter should have four measuring elements - three in phases and one in neutral path.	
53.	Anti-Tamper features	Comply as per TS	

Sr. No.	Item	Minimum requirement	Bidder's Data
54.	Programmability	It should be possible to program the parameters limits / values remotely through adequate security mechanisms. Once programmed it must possible for the programmed parameters to come into effect from a specified date & time. Metrology under such condition must remain intact and shall not be upgradable from remote & Meter shall be as per IS 15959 part 2	
55.	Communication	The port for local communication and baud rate shall be as per IS 15959. In addition to this the meter will have a provision for a modular plug in type Communication Module for NAN (Neighborhood Area Network) i.e. from Meter to router / access points/ data collector or directly for WAN (Wide Area Network).	
56.	Communication Protocol	As per IS 15959 Part 3(2017)/DLMS-COSEM	
57.	RTC & time synchronization	Meter shall have RTC with 20 years calendar programmed in the memory and provision for time synchronization, the maximum drift shall not exceed +/- 300 Seconds per year. The clock day/date setting and synchronization shall only be possible through password/Key code command from remote server through suitable communication network. Contractor shall submit the methodology for the synchronization of RTC.	
58.	Data Retention	Non-Volatile Memory (non-battery backed up) with 10 years data retention in absence of power.	
59.	Battery Backup	Meter shall be supplied with separate battery backup for RTC and for display in case of power failure. The battery shall have a guaranteed life of 10 years from the date of installation of meters.	
60.	Data display facility (manual/Auto)	Data Display shall have following features: • High Resolution (Shall display energy values with resolution of 2 digits before decimal and 5 digits after decimal.	

Sr. No.	Item	Minimum requirement	Bidder's Data
		Minimum 7-digit LCD display having minimum 8.5x5 mm min for all digits Display of data as per TS. The Push button for manual scrolling in addition to auto scrolling with a persistence time of 10 seconds for each parameter shall be provided. High resolution (shall display energy value with resolution of 2 digits before decimal and 5 digits after decimal. KWh total and fundamental kwh are essential to follow regulation • Display of data as per TS • In case of Net Metering Import, Export and Net will be available at Meter Display and at HES also • In case of prepaid meter Display parameters should be available as per IS 15959 and latest amendment and same shall be available at HES also. With additional parameters of export TODs, the requirement shall comply to IS16444 part 2 for import - export meter parameters.	
61.	Remote Firmware Upgrade	The meter shall support remote firmware upgrades as well remote configuration in order to remotely add new features and functions to meters without having to send person to field in secure manner.	
62.	Testing of Smart Meter	Comply as per TS	
63.	Other parameters/features not covered in the above GTP	Conform to specification as per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment.	

REMARKS:

(1) All the information/parameters indicated above shall exist in the meter offered & shall withstand all the tests specified above within the variation of current/voltage frequency and climatic conditions specified therein.

(2) Even though if any features or parameters are not specifically covered in this GTP, but are essential for the satisfactory performance of the meter as per the specification, are deemed to have been covered in the GTP.

Cubicle (SMC) for Housing LT AC Three Phase Four Wire, CT Operated Static Energy Meter and 4 No. Epoxy Resin Cast CTs.

Guideline:

In case of deviation in the below mentioned technical specifications from the IS applicable IS:16444 Part-I & IS:15959 Part-II with latest amendment or IS applicable IS:16444 Part-II & IS:15959 Part-III with latest amendment whichever is applicable, then the AMISP has to comply with the IS:16444 Part-I & IS:15959 Part-II with latest amendment or IS:16444 Part-II & IS:15959 Part-III with latest amendments whichever is applicable.

The viewing window to be tightened with the frame of same Material and this arrangement shall ensure Ingress against of water & dust inside the confirm Box. 4 glands on each side to accommodate max cable size of 240sq mm is sufficient.

TECHNICAL SPECIFICATION OF LT CT METER BOX

(1) SCOPE:

1.1 The specification cover the manufacture, testing, and supply of moulded Meter Box of excellent weather ability so as to house LT CT operated three phase four wire static energy meter and LT CT's to offer protection against harsh weather, external hazards and internal hazards having anti-corrosive, dust proof, shock proof, rust proof, vermin and water proof and fire proof, UV stabilized and pilfer proof. The Boxes should be suitable for indoor and outdoor installations confirms to ingress protection level IP-55 and shall not deform or melt when exposed to fire.

1.2 It should also conform as per the technical requirements, as per indicative drawing; Indicative drawing shall be provided by the agency for approval

1.3 It shall consist of 2 compartments. The upper compartment is meant for housing 1 No. Static Three phase four wire meter, modem and antenna, if required, and the lower compartment are for housing 4 Nos. Current Transformers (CTs.).

1.4 Bidder shall also provide four no. Epoxy Resin Cast CTs, control cables, clamps, terminal block, etc. as required. Note that a TTB is not required for LTCT meters.

(2) MATERIAL OF METER BOX:

2.1 The Boxes must be weatherproof made out of Thermo setting Plastic SMC (Sheet Molding Compound) confirming to IS: 13410: 1992 with flame retardant properties, mechanical and corrosion resistant properties. The overall dimension of double compartment Box to accommodate a L.T. C.T. Operated three phase four wire Static Energy Meter, with Modem in upper compartment and four CTs. in lower compartment should be as below:-

	HEIGHT (H) Minimum	**WIDTH (W) Minimum**	**DEPTH (D) Minimum**
Upper Compartment for housing meter.	420 mm.	350 mm.	230 mm.
Lower Compartment for housing CTs.	430 mm.	350 mm.	230 mm.

Overall dimension	850 mm.	350 mm.	230 mm.

(The size of box as per the suitable size of meter and approved in GTP may also be acceptable)

2.2 These should be capable of withstanding temperatures of boiling water for 5 minutes continuously without distortion or softening. The thickness of the box shall not be less than 2.0 mm on all sides including door.

The Box shall have 4 mm thickness on the tongue and groove area. The Meter Box cover shall have a groove to hold minimum of 2.5 mm. Neoprene gasket. The tongue of the base shall ensure tongue, Groove and sealing arrangement against rainwater and dust entering inside the Box. Other better arrangement can also be offered subject to purchaser's approval. The Box shall have its roof tapering down for easy flow of water.

2.3 The Boxes shall generally comply with the provision of IS: 14772: 2000. The Boxes shall be suitable for outdoor/indoor application. The Box shall be with good workmanship. There should be a minimum of 50 mm. clearances on all sides and 25 mm. clearances on the front and 10 mm. clearances on the back of the meter.

2.4 Soft rubber gaskets shall be provided all rounds wherever required protection against entry of dust and water.

2.5 The Box shall be off white.

(3) CONSTRUCTION:-

The contents of the box are as follow:

(i) **Viewing Window:** The viewing window made up of a scratch and break resistant, UV resistant, transparent polycarbonate/ Toughened glass and shall be provided on the door for reading the meter without inconvenience. The minimum thickness of the viewing window shall be 2.0 mm. The window shall be ultra-sonically welded / window is tightened with the frame of same material (SMC) and this arrangement shall ensure ingress against of water & dust inside the box. There should not be any ingress of moisture through this window into the box OR in case of toughened glass fixing arrangement may be provided as per design. The viewing window to be tightened with the frame of same Material (SMC) and this arrangement shall ensure Ingress against of water & dust inside the confirm Box. PC window will provide with ultrasonic welded may be acceptable.

(ii) **Internal Hinges**:
A minimum of 2 Nos. Brass/Stainless Steel / Mild Steel (M.S.) Corrosion resistant plated internal hinges to be fitted with the Meter Box body base and the cover on each door well protected against corrosion shall be provided. corrosion free Stainless Steel hinges may be accepted

The hinges of the door should be concealed and they shall be fixed to flanges provided to the base and cover of the box in such a manner that the door opened by minimum 120 degrees.

(iii) **Earthing Bolt**: M8x40mm M.S. Bolt with 2Nut,4plain & 1 spring washer will be provided

(iv) **Fixing arrangement:** The top compartment of the box should be used for the three phase four wire energy meter, modem and antenna. The meter shall be mounted on SMC sheet of 4 mm. thickness with suitable metallic screws and the screws shall not be protrude outside of the box. The meter base supports inside the box are raised by minimum 10 mm. in the box for ease of wiring. While fixing the meter, Screws should not protrude outside. The meter box shall have 4 Nos. of wall mounting bracket made out of SMC with proper screw to fix with the bottom base and provision and provision for 6 mm. dia-hole for mounting the SMC Meter Box/ wall Mounting brackets made out of M.S. material for mounting the box on pole, which shall hold the weight of the box while clamping on a Pole with suitable screws. Mounting Brackets made out of M.S. Material for

Mounting the Box on Pole, which shall hold the

weight of the Box while clamping. The fixing shall not be complex and shall be easily approachable for connections when the door(s) in open condition and is completely tamper proof once it is sealed. There is no requirement of modem to be installed in the meter box.

(v) Similarly, SMC shall be provided for mounting four nos. LT CT's in lower compartment box. Separate doors for each compartment should be provided. Suitable handle/ knobs shall be provided on both the doors.

(vi) **Latch:** The door shall be provided with a G.I. latch or 'U' clamp/ U latch of SS Material to secure it with the base of the box.

(vii) **Sealing arrangement:** The box shall have provision for minimum 2 Nos. seals to make it fully tamper proof.

(viii) Inlet and Outlet:

a) In case of consumer LT CT Meter: 1 Nos. hole size 2½ inches with superior quality rubber cable glands shall be provided on incoming side and 4 Nos. holes with superior quality rubber cable glands shall be provided on other side of the lower compartment of the box for cable entry.

Similarly, 4 Nos. holes with superior quality rubber cable glands shall be provided in the Partition sheet of upper & lower compartments of the cubicle for entry of secondary wires of CTs. Internal diameter for gland used in partition sheet shall be 15mm.Glands shall be made such that internal diameter of glands provided for cables should be closed with the film of minimum 1mm thickness. Cable will go through the cable glands by piercing the film of the glands. Cable glands shall be fixed with suitable adhesive so that the same does not get removed.

(ix) **Printing**: Metallic label containing the letters "Name of Discom" and the purchase order and date shall be engraved in the top cover of the Box. The name of the manufacturer shall be engraved on the bottom of half of the box. A blank sticker shall also be fixed on the meter box for use of field staff to indicate the service No., Meter constant, CT ratio etc.

(x) **Sample Meter Box**: One sample of meter box as per specification and drawing shall be submitted for approval in case order is placed on the successful bidder.

(xi) **Tests:** The double compartment LT CT meter box and material of meter box shall be subject to type test confirming to relevant IS: 13410: 1992, IS: 14772 , IS : 4249 and IS: 11000 (Part -2 Section - 1).

(4) General technical detail of L.T. current transformer for use in connection with L.T. C.T. operatedenergy metering are as follows:

General technical detail of L.T. current transformer for use in connection with L.T. C.T. operated energy metering are as follows:

i. C.T. shall confirm to IS:2705 or its latest version thereof.
ii. Current transformer should be resin cast, ring type construction. Construction shall be single phase single core type. The internal diameters of the C.T. shall be approved by employer.
iii. CT current ration shall be approved by Project Manager.
iv. Suitable mounting robust clamp as per manufacturer design shall be provided.
v. Secondary terminal shall be of brass stud type. The size shall be minimum 6.0 mm dia 20 mm outside length with spring washer and double nuts.
vi. Rated voltage shall be Single Phase 240 V line to neutral (+15% to – 30%)
vii. Accuracy class of 0.5 as per IS.
viii. Rated burden shall be of 5 VA.
ix. The instrument security factor shall be less than or equal to 5.
x. Rated short time current of 5 KA for 1 sec. Corresponding to rated dynamic peak current of 2.5 x 5 KA (peak)
The ratio shall be engraved on the body of C.T. In addition, name plate of anodized aluminium indicating the necessary details, year of manufacture etc. engraved on it shall be provided in such a manner that the information is clearly visible after mounting.
xi. The secondary and primary terminals shall be clearly marked as S1 & S2.
xii. The bidders should submit the drawings of offered CTs.
xiii. The following CT ratio shall be selected for the consumer:

- For LTCT consumer-100/5A and 200/5A
- Categories are as follows:
    - single phase -5-30 Amp, cat D1
    - 3 phase WC-10-60 Amp, Cat D2
    - 3phase WC-20-100Amp or Better (i.e-10-100.Amp), Cat D2
    - 3 phase LT CT- -/5Amp, Cat D3

Please refer feeder wise and circle wise data. Necessary survey to be carried out by AMISP

VERIFICATION / TESTING OF METERS SUPPLIED

a) Type test

In case of order, three (3) samples for Type Test and DLMS conformance test shall be selected & sealed by authorized person of Discom from the first lot received in Purchaser's Area stores. The selected samples shall be sent with complete details for type test at CPRI / any NABL accredited test house. The type test charges shall be borne by the supplier.

In case of successful type test and DLMS conformance test results, supplies shall be continued. However, in case the meter(s) do not meet the requirement as per ISS/CBIP/Specification in type test(s), three more samples shall be selected from the supplies already received to get them type tested at supplier's cost. In case of repeat failure in type test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled.

b) Acceptance test

i) On receipt of subsequent consignment of individual DI in Area Stores, set of meters as per relevant standards shall be selected randomly and sent to CPRI or any other NABL accredited lab for conducting acceptance test as per the prescribed procedure.

ii) In case of failure of samples of lot/ sub-lot in the test(s) detailed in ISS, **the similar testing procedure as described shall be repeated on another lot and if the lot fails consecutive second time the entire quantity of respective lot/sub-lot shall be rejected and shall have to be replaced by the supplier** at his own cost. Repeated failure/poor results in the testing may render cancellation of order.

iii) The supplies, at the option of Utility, may be utilized in the field during the period of testing. In case of repeat failure in Type/Acceptance Test(s), the order of balance quantity including the quantity lying unused in the stores/ field shall be cancelled. The Utility also reserves the right to accept or reject the utilised quantity in the field on the basis of the test results.

iv) The utility also reserves the right to get additional samples for all or any of the selected tests at Utility's cost at any independent test house at any stage of supply, if so considered necessary to ensure that the quality of meters being offered for inspection is same as previously type tested meters.

In case of failure in type test, the Purchaser at its discretion may allow the supplier to re-offer the material after change/ modification in the design of meters. The balance material shall be accepted only after successful Testing. The Testing charges shall be borne by the supplier. However, the supplier will have to pay liquidated damage towards delay in supply on account of re-offer in accordance with original delivery schedule of purchase order.

Annexure D Three phase CT/PT operated alternating current Smart Meter of Accuracy Class 0.5S/ 0.2S (as required) –, HT Consumers .

D.1 General Standards Applicable for Meter

Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following standards and amendments/revisions thereof.

Sl. No.	Standard No.	Title
1	IS 16444: Part 2 with latest amendments	AC Static Transformer Operated Watt-hour and VAR-Hour Smart Meters, class 0.2S, 0.5S and 1S
2	CBIP- Publication 325 with latest amendments	Standardization of AC Static Electrical Energy Meters
3	CBIP Technical report no. 111 with latest amendments	Specification for Common Meter Reading Instrument
4	IS:9000 with latest amendments	Basic Environmental Testing Procedures for Electronic & Electrical Items.
5	IS 12063 with latest amendments	Degrees of protection provided by enclosures of electrical equipment.
6	IS 14451, Part-2: 1999 with latest amendments	Telemetering for consumption and demand. Direct digital transfer of meter values.
7	IS 4905: 1999 with latest amendments	Methods for Random sampling.
8	IS 12346 with latest amendments	Specifications for Testing Equipment for AC Energy meter.
9	IS 15959 Part 3 (as applicable) with latest amendments	Data exchange for electricity meter reading, tariff and load control: Companion specification

Climatic Condition:

a	Maximum ambient air temperature	50^0C
b	Maximum ambient air temperature in shade	45^0C
c	Maximum temperature attainable by the meter exposed to sun	60^0C
d	Minimum ambient temperature	(-) 5^0C
e	Average daily ambient air temperature	40^0C
f	Maximum relative humidity	95%

g	Number of months of tropical monsoon condition	4 months
h	Maximum altitude above mean sea level	1000 meters
i	Average annual rain fall	150 cms
j	Maximum wind pressure	200 kg/sq.mm
k	Isoceraunic level (days per year)	40
l	Seismic level (horizontal acceleration)	0.30 g
m	Permitted noise level	45.db

In addition to above Temperature range shall be govern from CBIP report no. 325

Specified operating range	-10^0C to 55^0C
Limit Range of operation	-25^0C to 60^0C
Limit Range for storage and transport	-25^0C to 70^0C

D .2 Communication

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. The selection of communication technology should be as per the site conditions and as per design requirement of the AMISP to meet the Service Level Agreements (SLAs). In case of cellular based meter, the meter shall accommodate SIM Card / e-SIM of any service provider. For installation on HT consumers, if cellular, the meter shall accommodate dual SIM Card / e-SIM of any service provider/multinetwork or dual-profile SIM. The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

The meter shall capture power quality parameters such as current and voltage harmonics.

D .3 Other Specifications

Particulars	Specifications
Applicable Standards	The meters shall comply with IS 16444: Part2 for all requirements except for those parameters which have been specifically mentioned to be otherwise in this specification.
Reference Voltage	[As per relevant IS]
Current Rating	Ib 5A/ 1A (as applicable)
Starting Current	As per IS 16444: Part2
Accuracy	Class 0.5S or 0.2S as per IS 16444: Part 2 (As applicable)
Limits of error	As per IS 16444: Part 2
Operating Temperature range	As per IS 16444: Part 2
Humidity	As per IS 16444: Part 2

Particulars	Specifications
Frequency	As per IS 16444: Part 2
Influence Quantities	As per IS 16444: Part 2
Power Consumption of meter excluding communication module	As per I S 16444: Part 2
Currentand Voltage circuit	As per IS 16444: Part 2
Running at No Load	As per IS 16444: Part 2
Test output device	As per IS 16444: Part 2
Meter Display	As per IS 16444: Part 2
Time of Use (In case of net-meter both export & import parameters to be measured)	As per IS 15959: Part 3/IS16444(part2) with latest amendment (as applicable)
Parameters to be measured	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable)
Power Quality Information	As per IS 15959: Part 3 (as applicable)
Maximum Demand	As per IS 15959: Part 3 (as applicable)
Load Survey/Interval Data	As per IS 15959: Part 3 (as applicable)
LED/LCD Indicators	As per IS 16444: Part 2
Tamper/Event recording	As per IS 15959: Part 3 (as applicable)
Alarm	As per IS 16444 / IS 15959: Part 3 (as applicable)
Measuring Elements	As per IS 16444: Part 2
Anti-Tamper features	The meter shall continue working under tamper conditions as defined in IS 15959 Part 3 and would log the event and send alarm at HES after logging of the defined tamper features as per IS 15959 Part 3.
Programmability	As per IS 16444: Part 2
Communication	As per IS 16444: Part 2
Communication Protocol	As per IS 15959: Part 3 (as applicable)
Real time clock (RTC)	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable)
Data Retention	As per IS 16444: Part 2
Battery Backup	Meter shall be supplied with separate battery backup for RTC.
Data display facility (manual/Auto)	As per IS 16444: Part 2 (as applicable) However minimum requirement should include the following: Data Display shall have following features: • High Resolution (Shall display energy values with resolution of 2 digits before decimal and 5 digits after decimal. • The Push button for manual scrolling in

Particulars	Specifications
	addition to auto scrolling with a persistence time of 10 seconds for each parameter shall be provided. Display of data as per **IS 16444 (Part 2)**
Remote Firmware Upgrade	As per IS 15959: Part 3 (as applicable)
~~Digital Input (DI)~~	~~The Smart meter should have the provision of sensing digital inputs via DI (Digital Input) port provided at the terminal block. The smart meter should register the digital input(s) sensed, upon reaching respective threshold (configurable) and the event shall be communicated to HES. The OBIS code required for this shall be provided during detailed engineering.~~ ~~The requisite power supply requirement (AC to DC auxiliary supply/ charger) for the DI should be made internal to the smart meter itself. In case the same is not feasible to be provided, bidder should provide external power supply with following specifications.~~ ~~a) Input voltage: 63.5V AC~~ ~~b) Operating voltage: 12V DC~~ ~~c) Contact Rating: 5A Continuous @30V DC, 25A for 3 sec~~ ~~No. of DIs 04 Nos. DI for 4V(DC), 10 mA~~
Robust design in terms of abnormal voltage/frequency, impulse voltage and protection against ingress of outer impurities	1. The accuracy of the meter should not be affected with the application of abnormal voltage/ frequency generating device having spark discharge of approximately 35KV on entire meter case (including module cover). 2. Meter shall be capable to withstand 10KV impulse voltage test as per IS 16444 Part 2. 3. Meter shall comply with IP- 54 as per IS 16444 Part 2 The meter case shall have break to open functionality with clear physical evidence on forcibly opening of cover. Meter case shall not have any screw between base and cover however it should be welded by any means. Test should be apply when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box and for conformance criteria of energy meter with 35 KV spark device & jammer test guideline as per CBIP-325 appendix-J should be followed".
Supply quality measurement & Total Harmonic Distortion (in % of fundamental)	Meter shall be able to record phase wise voltage & current THD minimum up to 11th Order harmonics preferably up to 31st order harmonics. This shall be available in meter data & load profile. Meter shall have capability to log at least 20 nos. following quality of supply monitoring events with date & time: 1. Phase wise voltage THD 1. 2. Phase wise current THD

Particulars	Specifications
Field replaceable communication	Communication module shall support plug & play design. It shall be field swappable in case of failure of communication module. In no case, entire meter has to be replace in case of communication module failure.
Special Display provision	Display shall also have specific legends for direction of power flow, WAN comms, TOU & billing values. Meter shall have scroll Lock facility to display any one desired parameter continuously from display parameters.
Meter health status	Meter shall provide internal health of Meter indicating RTC, NVM, Battery and communication module status , all display segments on meter display & Time and date on meter display
Meter Reading in Power off MODE	Provision to read the meter in no power condition shall be made. In case of power failure Auto mode shall be disabled. The push button shall be used for displaying the Billing parameters. In case of power failure meter data download through optical port shall be possible. The battery used for RTC shall not be used for the display and separate battery shall be used in power off condition for meter reading and meter data downloading
Electromagnetic compatibility	The static energy meters shall conform to requirements listed in IS 16444 Part-2 and shall also be protected against radiated interference from either magnetic or radio-frequency source.
Connection Diagram	The connection diagram of the meter shall be clearly shown for 3 phase 4 wire system, on the terminal cover. The meter terminals shall also be marked and this marking should appear in the above diagram.
Mid Night Energy	Meter shall be capable to daily snapshot at 00:00 hrs. for last 60 days with following cumulative energy parameters: • Active Import Total (Q1+Q4) • Active Export Total (Q2+Q3) • Active Import Fundamental (Q1+Q4) • Active Export Fundamental (Q2+Q3) • Reactive Import while Active Import – Q1 • Reactive Import while Active Export – Q2 • Reactive Export while Active Export – Q3 • Reactive Export while Active Import – Q4 • Apparent – While Active Import • Apparent – While Active Export • Net Kwh (Import- Export)

Particulars	Specifications
	• Net Reactive (Q1+Q2-Q3-Q4) • Net Apparent(Import-Export) • Real time clock date & Time •
Rating Plate and marking	• The rating plate of meter shall have 'ISI' mark which shall be indelibly and clearly marked at the appropriate place of the meters. The meter shall have a name plate clearly visible, effectively secured against removal and indelible & distinctly marked with the particulars mentioned generally as per IS: 16444 with latest amendments. • Purpose of LED indicators shall be clearly printed on the name plate. The bar code provided on the meter plate shall include information of meter serial number. • The following must be clearly indicated on rating plate: - • Manufacturer's name or trade mark • Type Designation • No. of phases & wires • Serial number • Month and Year of manufacture • Reference Voltage • Rated secondary Current • Reference Standard as applicable • Principal unit(s) of measurement • Meter Constant • Class index of meter • Purchase Order No. & Date • Warranty period • The following additional information shall also be provided as applicable in the name plate: • Communication technology • Category of meter (As per IS15959-part3) • The reference temperature

Particulars	Specifications
	• • Qrcode/Bar code
Time of day/use register as per MPERC provision	The meter shall have capability of storing & display 8 different TOD zones for energy & MD registers. The registration of energy consumption shall be upto 12 channels. The time period of TOD recordings may be programmable as per DLMS standard with proper security. At the time of supply by default timing shall be 22:00 hrs to 6:00 hrs , 6:00hrs to 9:00hrs , 9:00hrs to 17:00 hrs and 17:00 hrs to 22:00 hrs All TOD registor shall be displayed on meter LCD display. TOD1: 22:00 hrs to 6:00 hrs(Next Day) TOD2:6:00hrsto9:00hrs TOD3:9:00hrs to 17:00 hrs TOD4: 17:00 hrs to 22:00 hrs
MD registration	a) Maximum Demand Computation will be based on Sliding Window concept with integration period as default of 15 minutes(DIP) with 5 minutes sub integration period. Meter should be configurable for recording of MD with integration period of 5 minutes and 30 minutes with 1 minutes and 10 minutes sub integration period. The MD integration cycle shall be on the basis of real time b) However the real time clock of the meter shall be used only for the purpose of time matching. For computation of maximum demand the internal clock of the meter shall be made use of. c) The billing parameter at the time of automatic reset of the MD along with one previous record shall be stored and display shall be possible on demand. In every case the design shall include provision of updating of cumulative demand register with updating of reset counter. By default MD will be reset at 00:00 Hrs. on 24th day of every month. d) The rising demand with the elapsed time should be held in the memory in the event of interruption or switching off supply and it should not become zero on such instances.
Terminal Block	Current terminals shall withstand current 150% of maximum current for 4 hours continuously. Centre to centre distance between adjacent terminals in terminal block shall be as per latest IS-16444 Part-2 with latest amendments. The terminal block shall satisfy all the conditions such as clearance &

Particulars	Specifications
	creepage distance between terminals & surrounding part of the meter as specified in relevant clause of IS 16444 Part-2. The terminal holes in the insulating material shall be of sufficient size to accommodate the insulation of the conductors. The diameter of the terminal hole for voltage & current terminals shall be of adequate length in order to have proper grip of conductors / crimping pins with the help of two screws. The terminal screw shall be made of Nickle Plated brass. Mechanism for guiding the terminal screw for proper fitment. The manner of fixing the conductors to the terminals shall ensure adequate and durable contact such that there shall have no risk of loosening or undue heating. Screw connections transmitting contact force and screw fixing which may be loosened and tightened several times during the life of the meter shall be such that the risk of corrosion resulting from contact with any other metal part is minimized. Electrical connections shall be so designed that contact pressure shall not be transmitted through insulating material. The terminal arrangement and connection diagram shall be marked in accordance with IS 16444
Terminal Block Cover	The terminals block cover for the energy meters shall be extended transparent type, which can be sealed independently of the meter cover. The ETBC shall have a clear space of minimum 25 mm, thus allowing sufficient clearance space for inserting cables. ETBC shall have a hinge arrangement for easy access of terminal for wire termination. The terminals, their fixing screws and the insulated compartment housing them shall be enclosed by extended terminal cover in such a way that no part of meter or accessories at terminal block shall be accessible from the front of the meter. There shall be provision of fixing of two seals on either side so that screws cannot be loosened without breaking the seals.

Particulars	Specifications
Meter Case	The housing of the meter shall be safe high-grade engineering plastic or any other high quality insulating material and shall be very compact in design. All the insulation materials used in the construction of meter shall be non-hygroscopic, non-ageing & of tested quality, capable of withstanding resistant to heat & fire. The construction of the meter shall be such that it can be sealed independently and the cover cannot be removed without breaking the seal. The meter case shall break to open functionality with clear physical evidence on forcibly opening of cover. The meter shall have transparent/opaque cover and opaque base. In case of opaque meter cover, there shall be provision of transparent window to see the display of meter. Meter cover and case shall be ultrasonic welded / encapsulated design with chemical welding with break to open design.

Power factor for computation of Apparent Energy (KVAH)	A) KVAh computation shall be on the basis of power factor “lag+lead” Principle. B) Meter shall be programmable for “lag only” principle also. C) By default, meter shall be supplied with “Lag+Lead” calculation.
Billing Registers/MD RESET	A) The rising demand with the elapsed time should be held in the memory in the event of interruption or switching off supply and it should not become zero on such instances. B) Meter shall be capable to reset of MD as follows: • Auto reset (Period as to when automatic reset of maximum demand is required shall be programmable). • Remote reset (by Remote Reading software Application, HES and hand-held instrument capable of communicating with the meter). • Local push button.
Button	a) Meter shall have provision of two no push/touch button for initiate of backward and forward scroll of meter display parameters in front of the meter. B) Meter shall be made MD reset push button with sealing

	provision.
Fixing arrangement	A) Every meter shall have three fixing holes one at the top and two at the bottom for mounting purpose. B) The top hole shall be provided with a special clip at the back of the meter so that holding screw is not accessible to the consumer after the fixing of the meters
Manufacturer's Seals	a) On the meter body one sealing screw shall be provided with good quality 7 digits numbered polycarbonate seal or any superior body sealing arrangement with embossing on sides. One side with the logo of firm and other side MPPKVVCLIndore. b) The nos. of the seal shall be unique and should not be repeated in any case. Access to the working part should not be possible without breaking the seals. The polycarbonate seals shall have proper locking to avoid opening of the seal in any case by means of tampering
Sealing of the Meter	Proper sealing arrangement shall be provided on the meter to make it tamper proof and avoid mishandling by unauthorized person. Following sealing arrangement shall be provided in meter: A) At least two (2) seals on the body. B) 2 nos. tamper evident sticker seals between the base and cover of the meter body. C) Two (2) seals on the terminal block cover. D) One seal each on MD reset push button or provision to make sealing arrangement for MD reset button cannot easily approachable. E) Sealing provision shall be provided in optical communication port shall be provided. F) Provision shall be made of minimum two no seal for plug in type communication module. Beside body seal and communication module seal provided by the manufacturer, provision shall also be made to provide utility lash wire seals on the body. All the seals should be provided on front side only. Rear side sealing arrangement will not be preferred. Sticker seals on meter body shall also be provided by meter manufacturer
General Mechanical Requirement	A) The construction of the meter shall be rigid & suitable to withstand shock & vibration involved in transportation & handling, as specified in CBIP technical report 325/IS16444. Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against electric shock, safety

	against effect of excessive temperature, protection against spread of fire, protection against penetration of solid objects, dust and water.
Power Factor range	PF range Zero (lag) – unity – Zero (lead) and should not be greater than unity
Voltage Variation	(-) 30% to (+) 20% as per standards
Billing period counter	Cumulative billing period counter for billing periods shall be provided as per IS 15959
Programmable Parameters	All the parameters mentioned in IS 16444(Part2) & IS15959 (part3) with latest amendment and specification included following additional parameters shall be provided by meter: a) Billing date b) metering mode c) MD reset d) TOD
Meter Reading	It should be possible to download & view parameters and load survey data on to a compatible computer and obtain full details of demand and consumption in statement form and also in graphic form and phasors of voltage and current at server end/application software.

D.4 Technical requirement & design criterion

Particulars	Specifications
Basic system parameters for which these meters will be used	A) Primary/ Secondary voltage : -/63.5V (phase to neutral) B) Primary/ Secondary current : -/5Amp or -/1 Amp (as required) C) The meters shall be designed for 5Amps /1Amp CT Secondary (as per requirement) and 200% overloading D) Meters shall be designed on 3 phase 4 wire measurement principle & should have 3 current & 3 voltage measuring circuit i.e. one for each phase. E) Meters shall be suitable for measurement of energy and other billing parameters within the specified limits of errors under balanced and unbalanced loads conditions in a poly phase network. F) Computation of apparent energy shall be based on following principle. $S = \sqrt{(P2 + Q2)}$

Particulars	Specifications
	P = Pa + Pb + Pc Q =Qa + Qb + Qc Where- S stands for Total Apparent Energy. a, b & c stands for phases P stands for Active Energy. Q stands for Reactive Energy G) Dial multiplying factor for the specified CTs & PTs ratio shall be unity. H) The display of energy shall have minimum seven digits (7 main +1 decimal) with fixed decimal. The energy & demand shall be displayed in KWH & KVA respectively. I) The meter constants shall be frozen and it shall not be possible by the manufacturer or the user to alter the meter constants at factory or at site J) Provision shall be made to read various billing parameters and also load survey data through a Common Meter Reading instrument. This arrangement can be through an optical coupler or any other suitable device galvanic ally isolated from meter circuit. Provision shall be made to seal the optical coupler to ensure proper security. K) Indications shall be provided on display to show the healthiness of phase voltage and also the status of abnormal electrical connections, if any persist at the meter terminals. L) Meters shall be four Quadrant meter capable of recording active reactive and apparent energy and also demand in four quadrants. M) Meter shall operate and record satisfactorily independent of phase sequence of input supply and phase association between voltage and current circuits. N) No setting point/ setting register etc. shall be provided for adjustment of measurement errors
Display Parameters	a) The data shall be displayed on LCD display (backlit type), which shall be clearly visible from distance in 7 segment - 7 digits (Min.) having minimum character size of 10 mm.X 5mm wide viewing angle minimum 120 degree. b) It should be possible to easily identify the displayed parameters through symbols/ legend on the meter display itself. c) Meter shall have Scroll Lock facility to display any one desired parameter continuously from display parameters. d) Meter firmware version should be available

Particulars	Specifications
	on meter display and downloaded data in order to have proper traceability of features available in the meter.
Load Survey Capability	It should be possible to store previous data of at least 45 days i.e. load survey is needed for the demand and all energy consumed. The demand to be recorded in the load survey shall match with the demand recorded in the "DISPLAY PARAMETERS". The demand and energy consumed shall be recorded separately under energy Import and energy Export periods. Load survey based on 15 minutes integration period shall be selectable for the following parameters: i) Real time clock date and time ii) KWH (Import & Export) iii)KVAH (Import & Export) iv)RKVAH Lag (Import & Export) v)RKVAH Lead (Import & Export) vi) Net KWH Energy (Import - Export) (Configurable)vii) Phase wise Voltages viii) Phase wise currents In addition of above the following Additional parameters shall be provided in load survey: ix) PF (Import) & PF (Export) both x) Demand (Active, Reactive, Apparent) xi) % THD in R, Y, B Phase Voltage xii)% THD in R, Y, B phase Current A) xiii) Net KVArh (Import -Export) & Net KVAh(Import -Export)(Configurable)The choice of selecting any parameters indicated above shall be user selectable. B) All the load survey data should be available in numerical as well as graphical format. It should also be possible to view this data in daily, weekly and monthly formats. The load survey graph should show values. C) It should be possible to retrieve load survey data by hand held meter reading device through communication port provided on the energy meter. load survey data both in numeric and graphic form.
Billing Point Requirements	The predefined date and time for registering the billing parameters of active ,reactive, apparent energies of import and export along with its supported TOD registers and MD/ TOD MD as well as Tamper Count and Power-On hours readings shall be at 00.00 hours of the 24th day of

Particulars	Specifications
	each calendar (billing) month or any predefined date of the month. All billing parameters shall be transferred to billing registers apart from instantaneous parameters like voltage, current, PF, and readings of billing parameters, energy registers, TOD registers etc., the following additional parameters should be made available at the Remote Reading Software Application end: a) MD reset count. b) Billing Parameters for last 12 Histories c) Cumulative maximum demand
Immunity to Electromagnetic Disturbance	The meter shall be designed in such a way that conducted or radiated electromagnetic disturbance as well as electrostatic discharge do not damage or substantially influence the meter and meter shall work satisfactorily under these conditions as per relevant standards.NOTE:-The disturbances to be considered are:- a) Harmonics b) Voltage dips and short interruptions c) Conducted transients d) D.C. and A.C. magnetic fields e) Electromagnetic fields f) Electrostatic discharges g) Meter shall be capable of withstanding switching and transient surges of highest level so as to protect the internal meter circuit. h) Meter shall be type tested for Electromagnetic compatibility (EMC) and Electromagnetic Interference (EMI)and also submit type test report confirming successful performance
Influence of High Magnetic Field	a) The meters shall be provided appropriate magnetic shielding so that any external magnetic field (AC/DC electromagnet) as per CBIP Technical 325 (amendment Aug ’99 & September ‘99) applied on meter would not affect the proper functioning of the meter and meter shall work satisfactorily as per relevant standards. b) The meter casing shall be able to withstand higher levels of Electrostatic Discharge (ESD) and Magnetic interference.

Particulars	Specifications
ISI Certification Mark	The meters must bear “ISI” certification mark
D.5 Accuracy & Power consumption requirements Particulars	Specifications
Accuracy requirement	Meter should be 0.5s or 0.2s class (as per requirement) of accuracy. Meter should be complied accuracy requirement as per IS6444(part2) with latest amendment and condition mentioned in the specification under and after influence of following: A) Limits of Error due to variation of current B) Limits of error in single phase load at balance polyphase voltage C) Limits of Error due to Ambient Temperature variation D) Voltage variation E) Frequency variation F) 10% third harmonic in current G) Voltage unbalance H) Harmonics components in current and voltage circuit I) DC and even harmonics in AC current circuit J) Sub harmonics in AC current circuit K) Continuous (DC) “Stray” magnetic induction of 67mT±5% L) Continuous (DC)” abnormal” magnetic induction of 0.2T±5% M) Alternating (AC) “Stray” magnetic induction of 0.5mT±5% N) Alternating (AC) “abnormal” magnetic induction of 10mT O) Electromagnetic HF Field P) Radio frequency interference Q) Phase sequence Reversal (In accuracy class of Meter) R)
Power Consumption	The measurement of power consumption in the voltage and current circuits shall be determined as per IS16444(Part2) with latest amendment The power consumption in voltage and current circuit as follows: Voltage Circuit: a) The active and apparent power consumptions of a transformer operated meter for each circuit at reference voltage, reference temperature, and reference frequency shall not exceed 5.0 W and 15 VA during the idle mode of communication module and 7 W during data transmission when one cellular WAN

Particulars	Specifications
	communication module present in meter. b) The meter shall not be consisting any additional source of power for powering the plugin communication module. Energy measurement shall not be affected by power consumption. Current circuit: The apparent power taken by each current circuit of a CT operated meter at maximum current, reference frequency and reference temperature shall not exceed a maximum of 1 VA
Profile capture period	By defaults 15 minutes and programmable for 5 & 30 minutes, SIP(Survey integration period)should be same of DIP(Demand integration period)
Metering mode	Meter should be configurable in the following modes: A) Forwarded mode B) Bidirectional mode: The meter should record energy and all relevant parameters in both directions i.e., should have separate registers for import and export of parameters. C) Net Metering Mode: meter should have to configure in net metering and relevant additional Net energy register shall be updated in meter. D) By default, meter should be In Bidirectional mode. Meter should be logged any change in mode in event with date and time.
Anti-Tamper features	**a.** Meter should be identified occurrence and restoration of all possible tamper and log in its memory as an event and it is identified by event code. **b.** Meter should capture parameters for events as per IS 15959with latest amendment along with following parameters: i. active currents ii. Reactive Current iii. NET Energy iv. instantaneous power (KW, KVAR & KVA) Note: The OBIS code and capture parameters which are not covered in the IS15959 shall be provided by bidder after necessary approval from purchase department. It shall be provided during bid submission. Meter shall display indications for tamper

Particulars	Specifications
	continuously. This indication will reset only after restoration of tamper. Tamper information shall be roll over type and shall be FIFO based. The identification of phase, date and time of first occurrences, date and time of last tamper restore and cumulative number of tampering shall be indicated on the DISPLAY PARAMETERS and information regarding rest of the tampers, unbalance etc. are required to be included as in information in the VIEW PARAMETERS as per IS15959 Meter should comply feature mentioned in clause "A".
Event status Bit mapping	Event status Bit mapping as per IS15959(Part3) with latest amendment
Advanced security profile	Meter shall have advanced security as per IS15959(Part3) with latest amendment
Encryption for data communication	As per IS16444(Part2) and IS15959(Part3)
Encryption and Authentication for data transport	The security of data communication between the meter and client after establishment of the Application Association is to be handled by the setting for the associations as per IS15959 (Part3).
Key Requirements and handling	A) Every meter is pre-installed with a master key. HES have a record of the master key of each meter in the system. The meter key is a private key and its confidentiality is to be preserved. The master key is never transmitted between the clients and servers of the system. B) The meter shall be provided with a "Master Key".it shall be modified with safety and security.
LCD type	A) Meter LCD shall be STN (Super twisted numeric) type suitable for temperature withstand of 70°C. Dot-Matrix type LCD display is not acceptable. B) The data shall be displayed on LCD display with green backlit type, which shall be clearly visible from distance.
Display Cycle	A) Meter shall be auto displaying cycling push/touch button required with persistence time of 10 Seconds. B) The display of the parameters shall be continuously scrolling one after another through button. Display parameters shall

Particulars	Specifications
	move forward & backward if respective push/touch button pressed prior to the programmed time for display of each parameter.

D.6 **Constructional Requirements:Particulars**	**Specifications**
General Requirements	A) Meters shall be designed and constructed as per IS16444(Part2) and better design mentioned in specification. Meter shall be better than specification and Indian standard shall be acceptable. B) 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 should be compact & reliable in design, easy to transport & immune to vibration & shock involved in the transportation &handling. The construction of the meter should ensure consistence performance under all conditions especially during storms, heavy rains, very hot weathers. The insulating materials used in the meter should be non-hygroscopic, non-ageing & have tested quality. The meter should be sealed in such a way that the internal parts of the meter become inaccessible. C) The meter should employ latest technology such as Application Specific Integrated Circuit (ASIC) to ensure reliable performance. The mounting of the components on the PCB should be Surface Mounted Technology (SMT) type except some power supply related component. The electronic components used in the meter should be of high quality
General Mechanical Requirements	A) The meter should be housed in a safe, high grade, unbreakable, fire resistant, UV stabilized, virgin Polycarbonate/ High grade Engineering plastic casing of projection mounting type. B) The construction of the meter shall be rigid & suitable to withstand shock & vibration involved in transportation & handling, as specified in CBIP technical report 325. Meter shall be designed and constructed in such a way as to avoid introducing any danger in normal use and under normal conditions, so as to ensure especially personal safety against

Particulars	Specifications
	electric shock, safety against effect of excessive temperature, protection against spread of fire protection against penetration of solid objects, dust and water C) The meter cover should be opaque/transparent, for easy reading of displayed parameters, and observation of operation indicators. The meter casing should not change shape, size, and dimensions when subjected to 200 hrs on UV test as per ASTMD 53. It should withstand 650 °C glow wire test and heat deflection test as per ISO 75. D) Metering system shall be wall mounted projection type meter meeting with the requirements .The offered meter shall be complete in all respects including all components/accessories for effective and trouble free operation according to the specification .
Tropical Treatment	A) All parts, which are subject to corrosion under normal working conditions, shall be protected effectively. Any protective coating shall not be liable to damage by ordinary handling or damage due to exposure to air, under normal working conditions. B) Meters shall withstand solar radiation. C) The meters shall be suitably designed and treated for normal life & satisfactory operation under the hot and hazardous tropical climatic conditions as specified in clause no.D.1.
Meter Case	A) The housing of the meter shall be safe high-grade Engineering plastic or any other high quality insulating material and shall be very compact in design. B) All the insulation materials used in the construction of meter shall be non-hygroscopic, non-ageing & of tested quality, capable of withstanding resistant to heat & fire. C) The construction of the meter offered shall be such that it can be sealed independently and the cover cannot be removed and it should be break to open type. The case of offered meters shall be so constructed that any non-permanent deformation shall not prevent the satisfactory operation of the meter. D) Base Body: Material: High impact strength flame retardant, UV stabilized polycarbonate/ Engineering plastic

Particulars	Specifications
	Colour: Opaque E) Top Cover: High impact strength flame retardant, UV Stabilized polycarbonate/ Engineering plastic. Colour: Opaque/Transparent Top cover and base should be ultrasonically welded and cover should be break to open type. In case of encapsulated design chemical welding should be provided with proper fixing and sealing arrangement. As per design of meter, meter cover of high-grade transparent engineering plastic ultrasonically shall have one window which cannot be removed undamaged without breaking of meter cover.
Terminal Block cover	A) The terminals block cover for the energy meters shall be extended transparent type, which can be sealed independently of the meter cover. B) The terminals, their fixing screws and the insulated compartment housing them shall be enclosed by extended terminal cover in such a way that no part of meter or accessories at terminal block shall be accessible from the front of the meter. C) The terminals shall not be accessible without removing the seal(s) of terminal cover when energy meter is mounted on the meter board
Terminals	A) The base of meter shall have a terminal block at the bottom made out of high-grade Engineering Plastic so as to facilitate bottom connection & houses solid nickel-plated brass terminals having capability to carry maximum value of current. B) The terminal holes in the insulating material shall be of sufficient size to accommodate the insulation of the conductors. The terminal hole diameter for current terminals shall not be less than 5.5 mm& shall be of adequate length in order to have proper grip of conductors / crimping pins with the help of two screw.
Output device	A) Meter shall be as per IS16444(Part2) with latest amendment B) Energy Meter will have test output, accessible from the front, and be capable of being monitored with suitable testing equipment while in operation at site. The operation indicator will be visible from the front and test output device will be provided in the form of LED. C) Distinct LED/LCD indicators shall be provided for communication in progress. Resolution of the

Particulars	Specifications
	test output device will be sufficient to enable the starting current test as per IS16444(Part2). D) Distinct LED/LCD indicators shall be provided for communication in progress.
Manufacturer's Seals	A) Meter body shall be provided with good quality 7 digits numbered polycarbonate 2 no seal or any superior body sealing arrangement with embossing on sides. One side with the logo of firm and other side MPPKVVCL-Indore. B) The nos. of the seal shall be unique and should not be repeated in any case. Access to the working part should not be possible without breaking the seals. The polycarbonate seals shall have proper locking to avoid opening of the seal in any case by means of tampering C) Seal tracking software shall be provided by meter manufacturer **ADDITIONAL SEALS:** The bidder shall be required to supply 5nos.lash wire polycarbonate seals free of cost with each meter, as per specification appended herewith in Annexure E The series of seal numbers shall be provided by the [UTILITY] in the event of placement of order. The bidders are required to submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals with the sample meters for evaluation by the committee as per technical specifications given in Annexure-E.
Battery	a) Lithium or any better-quality battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. b) RTC battery & the battery for display (in case of power failure) should be separate. The facility for reading the meter in absence of power supply shall be provided. This facility shall be powering from a separate internal battery having minimum life of 10 years. Battery should not be accessible.
Memory	A) The meters shall have Non-Volatile Memory (NVM) for storage of all meter data i.e., Billing, Load survey Transaction Tamper data and meter functionality. There shall be no battery backup for retaining data. The registered parameters shall not be affected by loss of power.

Particulars	Specifications
	B) The display shall not be affected by electrical and magnetic disturbances. The meter shall make use of non-volatile memory capable of storing and retaining all the data required to be stores, without the help of any power source or battery backup and shall have a minimum retention time of 10 years under un-powered condition.
Optical port	A) Meter should have galvanically isolated optical communication Port as per IS/IEC- 62056-21 with proper sealing arrangement. B) Meter optical port should be capable to communicate with any make of CMRI, LAPTOP & mobile Application and up gradation of firmware. C) This port will support the default and minimum baud rate of 9600bps or more. D) Optical port shall be supported communication on DLMS standard and would be accessible through mobile app, CMRI in wired Mode. E) Meter optical port shall be compatible for remote reading by means of external modem with suitable remote reading software and meter manufacturer has to submit the pin configuration wiring diagram for this port
Electrical Port	As per IS16444(Part2) and IS15959(Part3)
List of components	List of components used in meter shall be provided by bidder.
PCB	A) Material: Glass Epoxy, fire resistance FR4 B) The meter should comply latest technology such as Microcontroller to ensure reliable performance. C) The mounting of the components on the PCB should compulsorily be Surface Mounted Technology (SMT) type. Power supply component may be of PTH type. D) The electronic components used in the meter should be of high quality and there should be no drift in the accuracy of the meter for at least ten years. ASIC with compatible processor and meter should be based on Digital measuring and sampling technique
Hand Held Unit (HHU)/CMRI	a. Provision shall be made to read various billing parameters and also load survey data through HHU/Common Meter Reading instrument. This arrangement can be through an optical coupler. Provision shall be made to ensure proper security. 15

Particulars	Specifications
	no CMRI should be supply free of cost. b. Meter should be capable for local reading through optical port by use of HHU (DOS Based) or other operating system for smart meter. HHU/CMRI shall have provision to record consumption for specific time period and recording of energy , load survey parameter and voltage and current parameters. c. The HHU shall be as per IS 15959(Part3) with latest amendment for data exchange and it shall be compatible to the DLMS compliant energy meters that are to be supplied on the basis of the specification having at least one USB communication port. d. Data downloading time from meter to HHU and PC should be within 3 min for meter data without load survey and within 5 minutes with load survey.

D.7 **Tests and Test Conditions:Particulars**	**Specifications**
Test for Metrology	As per IS16444(Part2) meter should be tested for metrology as follows: 1) Type Tests 2) Routine Tests 3) Acceptance Tests
Type Tests	a. The meter shall be of type tested as per tests specified in IS16444 and as per CBIP report no 325. b. The type test certificate for all tests as indicated in relevant standards (with latest amendments) and as per CBIP report No. 325 c. Type test certificates from any one of the standard laboratories NABL accredited for particular equipment/test shall only be considered. d. Type test certificate from educational institute(s) will not be accepted. The type test certificate shall not be more than 60 months old or as per CEA guidelines as on the date of opening of bid. e. Type test report, amongst other details, should contains the following information: i. Type of meter ii. Class of Accuracy

Particulars	Specifications
	iii. Communication type iv. Rating of meters f. Meter should be tested ingress of water and dust as per relevant standard mentioned in specification i.e., IP54 and material used in meter body should be tested at recognized NABL accredited lab. Bidder should provide test certificate along with bid. g. Test for smart meter communicability h. Smart meter functional requirement a) Meter reading on demand from HEs b) Schedule meter reading from HES c) Remote firmware upgrade from HEs d) All programming request from HES. e) First breath (power on) and last gasp (power off" condition and communicate to HES.
Routine Tests	a) All the routine test as per IS16444(part2) and CBIP no 325 shall be carried out on all the meters. b) Routine test certificate shall provide along with the supply of meters.
Acceptance Tests	All acceptance test as per IS:16444(Part2) , CBIP report No.325 shall be carried out on the meter.
Test for data exchange protocol	a) Data exchange protocol test on optical port as per IS15959 (Part3) shall be carried out on meters. Conformity of DLMS/COSEM test. The tests shall be performed for conformity. Test certificate from NABL accredited lab should require to submit along with bid and test will be conducted after supply of meter.
EMC/EMI and Magnetic interference test	Meter should test EMC/EMI and magnetic interference test as per relevant standard and CBIP325. Test reports from NABL accredited lab shall provide along with Bid.

D.8 Minimum Testing Facility, Inspection & Packing:

Manufacturer should possess following minimum testing facilities, Inspection & Packing:

Particulars	Specifications
Minimum Testing facility	a) The manufacturer's laboratory 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) b) Manufacturer should possess fully computerized Meter Test Bench for carrying out routine and acceptance tests as per IS16444 (part2) . Test results shall be print out facility. c) All the equipment, test bench including tamper logs kits/ jigs should

Particulars	Specifications
	be calibrated. d) In addition, this facility the manufacturer should produce Test Reports for each and every Meter. e) The bidder should have the necessary minimum testing facilities for carrying out the following tests: i) A.C. Voltage test ii) Insulation Resistance Test iii) Test on limits of errors iv) Test on meter constant v) Test of starting condition vi) Test of no-load condition vii) Repeatability of error test viii) Test of power consumption ix) Vibration test x) Communication test . xi) Tamper Jig and simulation facilities conditions mentioned in the specification (as per MPWZ Specification). xii) Meter testing bench with reference meter of class 0.02 xiii) CMRI communication xiv) Remote reading application software. xv) Self-heat test facility xvi) Magnetic tamper setup (AC, DC& Permanent) xvii) Earth fault Test setup xviii) ESD test setup as per relevant standard /CBIP325. xix) Glow wire Test xx) Ageing Test xxi) Smart meter communication by HES and smart mteer functionality All the equipment and others equipment as required should be calibrated and valid during the inspection and certificate should submitted along with bid
Pre dispatch Inspection	a) The Discom ‘s representative/ Engineer attending the above testing will carry out testing as per, IS: 16444(Part2) & CBIP report No.325 and this specification along with approved GTP and drawing. b) The inspecting officer shall also verify invoices of raw material and components used in manufacturing of the meter. c) The Purchaser’s authorized representative may carry out the inspection at any stage of manufacture. The Supplier/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

Particulars	Specifications
	specification by the Purchaser shall not absolve 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. d) All acceptance tests and inspection shall be made at the place of Manufacturer. The manufacturer shall provide all reasonable facilities without demanding any charge to the inspector representing the Purchaser to satisfy him that the equipment is being furnished in accordance with this specification. e) The Manufacturer shall keep the Purchaser informed in advance, about the manufacturing/readiness activities so that arrangement can be made for inspection. f) The Purchaser reserves the right to insist for witnessing the acceptance/routine testing of the bought out items. The Supplier shall give 15 days advance intimation to enable the Purchaser to depute his representative for witnessing the acceptance and routine tests. g) The Purchaser reserves the right to get type tests done in respect of any meter, or Box from any of the lots received at any bidders Stores at Supplier's expenses.
Testing During Inspection	a) All the acceptance test and routine test as per IS16444 (Part2) & Test specified in the specification. b) Sampling plan shall be governed as per IS guidelines. c) Meter functionality test as per IS16444 (Part2). d) Test for data exchange protocol as per IS16444 (Part2)/IS15959 (Part3) . e) Test for meter communicability as per IS 16444(part2). f) In addition of above the following test should be conducted during inspection: i) Physical verification of dimension as per drawing. ii) Display parameters as per specification iii) Data communication iv) Data communication from CMRI and PC v) Remote application software/ HES functionality i.e., data communication, meter instant, billing, load survey, daily load profile, event and transaction vi) Tamper/ fraud detection/logging features as per specification and approved thresholds. Tamper conditions will be simulated and meter accuracy checked during tamper condition. vii) Self-Heat test as per IS viii) Component verification

Particulars	Specifications
	ix) Server functionality. x) Readiness of material. xi) Measurement of Harmonics % THD in current and voltage xii) Measurement of KVAH xiii) MD calculation DIP xiv) Earth fault Immunity xv) Smart meter functionality
Quality assurance plan	A) The designed life of the meter shall be minimum 20 years and to prove the designed life, the firm shall have at least the following Quality Assurance Plan: a) The factory shall be completely dust proof. b) The testing rooms shall be temperature and humidity controlled as per relevant standards. c) The testing and calibrating equipment should be automatic and all test equipment shall have their valid calibration certificates. d) Power supplies used in testing equipment shall be distortion free with sinusoidal, wave- forms and maintaining constant voltage, current and frequency as per the relevant standards. e) Bidder shall have facility of cyber security and management system. f) During the manufacturing of the meters the following checks shall be carried out. 1) Meter frame dimensions. 2) The assembly of parts shall be done with the help of jigs and fixtures so that human errors are eliminated. The meters shall be batch tested on automatic, computerized test bench and the results shall be printed directly without any possibility of human errors.
Manufacturing Activity	a) Meter should be manufactured using SMT components and by deploying automatic SMT pick and place machine and reflow solder process. Further, the Bidder should own or have assured access (through hire, lease or sub-contract) of above facilities. b) Quality control should be ensured at the following stages: i. At PCB manufacturing stage, each board shall be subjected to computerized bare board testing. ii. At insertion stage, all components should undergo computerized testing for conforming to design parameters and orientation. iii. Complete assembled and soldered PCB should undergo functional testing using Automatic Test Equipment (ATEs). iv. Prior to final testing and calibration, all meters shall be subjected to aging test (i.e., meters will be kept in ovens for 72 hours at 55°C temperature and atmospheric humidity under real

Particulars	Specifications
	life condition at its full load current. After 72 hours meters should work satisfactorily to eliminate infant mortal. The calibration of meters shall be done in house
Guarantee	As per tender conditions
Packing	a) Each meter with terminals and communication modules should be shrink packed to avoid any scratches on meter body and to avoid entering of dust etc. b) Meters should be packed in a cushion cartoon of 5 nos. meters or any appropriate quantity. The packing cases should be marked to indicate the fragile nature of the contents. c) Packing should be done in such a way that meter's electrical and mechanical properties shall not affected by shoch and vibration due to road condition during transportation. d) Meters shall be closed packed by stockpiles to prevent rough handling during shipment, transport and storage. e) Packing for accessories and spares shall be done on wooden packing with labeled and protection. Handling and storage instruction shall be provided
Marking	On each group of meter box following details are required: a) Meter serial no range along with QR/BAR CODE b) MPPKVVCL-Indore LOGO and name. c) Purchaser's name d) Purchase order number. e) Manufacturer name & Address f) Type, rating and other description of meters g) Month & year of Manufacturing h) Weight in KG (Gross & Net) Instruction for handle
Test Report	Routine test report shall be provided with each meter
Shipping	Bidder shall be responsible for all transit damage.

D.9 Drawing and Technical Leaflets:Particulars	Specifications
Drawing	a) Individual meters should contain connection diagram on transparent terminal cover. b) Following drawing shall be submit along with BID for

D.9 Drawing and Technical Leaflets:Particulars	Specifications
	approval: i. GA and cross-sectional Meter & communication module drawing arrangement with all dimensions and view ii. Terminal connection arrangement drawing iii. Description of all parts of meter & communication modules. iv. Name plat drawing. v. Communication module drawing. vi. Details of network interface pin arrangement vii. Mounting arrangement as per design
Guaranteed Technical particulars (GTP)	a) Bidder should be submitted GTP along with bid for evaluation and approval. b) Display parameters as per specification sequence along with mode of operation (i.e.Import -Export & Net Metering)
Tamper Threshold Sheet	Necessary approval of tamper threshold mentioned in the specification is required to submit along with Bid.
Manuals	a) Two sets of such manuals shall be supplied to each consignee and two sets to this office b) All other details such as general arrangement, installation details operation instructions etc. should be given in the manual, which shall be supplied to the consignee. c) HES operation and integration with CMDM manual and instruction with proper security keys for end user shall be provided.
Components used in meter and module and their makes	Details of components used in meter along with make shall be submitted along with bid for approval for pre-dispatch inspection.
Sample meters	Bidder shall be submitted sample meter before commencement of supply. Meter shall be tested at end user for checking & testing all requirement mentioned in the TS.
Principal of operation	a) 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, shall be furnished by the bidder. b) The bidder shall indicate the method adopted to transform the voltage and current to the desired low values with explanation on devices used such as CT/shunt, potential divider as to how they can be

D.9 Drawing and Technical Leaflets:Particulars	Specifications
	considered superior in maintaining ratio and phase angle for variation of influencing quantities during its service period. The bidder shall furnish details of memory used in the meter
Delivery	As per tender conditions

A) TAMPER DETECTION FEATURES:

A.1: The meter shall work satisfactorily under presence of various influencing conditions like External Magnetic Field, Electromagnetic Field, Radio Frequency Interference, Vibrations, Harmonic Distortion, Voltage/Frequency Fluctuations, and Electromagnetic High Frequency Fields etc.

A .2: **Application of abnormal voltage/frequency:** Application of ESD devices should be performed in presence of communication module.

B)The accuracy of meter should not be affected and should be immune with the application of abnormal voltage/ frequency generating device such as spark discharge of approximately 35 kV. The accuracy of the meter, Real time clock disturb, Memory data corruption, meter functioning hangs up etc. Should not occur with the application of abnormal voltage/ frequency such as spark discharge of approximately 35KV with 0.01-10 mm spark gap in any of the following manner when applied for 10 minutes:

a. On any of the phases or neutral terminals
b. On any connecting wires of the meter
c. At any place in load circuit
d. Spark on meter body (includes joints, display, optical port)

C)Meter should be immune for tamper by application of remote induction device i.e. radiated spark through Jammer circuit.

(Note:-Application of 35kV and Jammer shall be when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box. LT meter box shall be used for Application of abnormal voltage/frequency in which meter easily accommodated.)

C.1: The meters should work even in the presence of any two Potential wires and presence of one phase and neutral.

C.2: Meter has to record all authenticated transactions performed with it and communicate the recorded data in meter readings. Recording may include lock/unlock, password change, and transactions like change of energy definition, billing date programming, change of tariff for TOD tariff, tamper reset, load survey configuration, MD IP change etc. operation which involve change in meter configuration given in Remote Reading Software Application scheduling with date and time.

C.3: Meter shall be capable to log following compartments of event as perIS15959:

Sl. No.	Event Type	Standard
1	Voltage Related Events	as per IS 15959 with latest amendment

Sl. No.	Event Type	Standard
2	Current Related Events	as per IS 15959 with latest amendment
3	Power Related Events	as per IS 15959 with latest amendment
4	Transaction Related	as per IS 15959 with latest amendment
5	Others Events	as per IS 15959 with latest amendment
6	Non-rollover Events	as per IS 15959 with latest amendment
7	Capture Parameters for Events	as per IS 15959 with latest amendment

C.4: Meter should detect and record phase association tamper with date and time. Meter shall operate and record satisfactorily independent of phase sequence of input supply and phase association between voltage and current circuits.

C.5: All tamper data shall not be to reset to ZERO. Minimum 400 events are required. i.e., 200 Occurrence +200 Restoration (i.e., FIFO or in rotational/roll over method). The Occurrence and Restoration of same tamper must be together with snap values. (More than 400 events(200 occurrence and 200 restoration may also accepted).

C.6: The meter shall have features to detect and log the occurrence and restoration of following anomalies, along with date and time of event as per IS15959:

Sl. No.	Tamper Name	Description	Occurrence	Restoration	Persistence time
1	Voltage Missing	To indicate loss of potential in any or two phases of potential supply. Meter should be detected and recorded occurrence and restoration of voltage missing tamper as per tamper thresholds. Events shall be detected phase wise.	Vx< 40% of Vref (irrespective to any other phase voltage) Ix >10% of Ib (X=r,y,b phase)	Vx> 41% of Vref Ix= Ignored	Occurrence 5 min Restoration 5 min
2	Low Voltage	Meter should be detected and recorded occurrence and restoration of low voltage tamper as per tamper thresholds. Events shall be detected in any phase.	Vx<75% of Vref> 40% of Vref	Vx>75% of Vref	Occurrence 5 min Restoration 5 min

Sl. No.	Tamper Name	Description	Occurrence	Restoration	Persistence time
3	Over Voltage	Meter should be detected voltage beyond certain limit of rated value and recorded occurrence and restoration of Over voltage tamper as per tamper thresholds. Events shall be detected in any phase.	Vx>115% of Vref	Vx<115% of Vref	Occurrence 5 min Restoration 5 min
4	Voltage Unbalance	Meter should be detected difference in voltages in phases and recorded occurrence and restoration of voltage unbalance tamper as per tamper thresholds. Events shall be detected in between of phases.	(Vmax-Vmin) >10% of Vref And all phase voltages> 75% of Vref	(Vmax-Vmin) <10%of Vref And all phase voltages> 75% of Vref	Occurrence 5 min Restoration 5 min
5	Current Reversal	To indicate reversal of CT connections or current in any or two phases of current terminal. Meter should be detected and recorded occurrence and restoration of current reversal tamper as per tamper thresholds. Events shall be detected phase wise.	Residual current >10% of Ib, Line current (if Ln>above limit) Ib, current (ifLn< above limit) >5 Ix>5 % of Ib, Direction: Negative Net Power factor > 0.3 (X= r,y,b phase)	Direction: Positive Net Power factor > 0.3 (X= r,y,b phase)	Occurrence 5 min Restoration 5 min
6	Current Unbalance	Meter should be detected difference in current in phases and recorded occurrence and restoration of current unbalance tamper as per tamper thresholds. Events shall be detected in between of phases.	(Imax-Imin)>30% of Ib Average Line current > 10% of Ib (Voltage unbalance should not persist)	(Imax-Imin)< 20% of Ib Average Line current > 10% of Ib	Occurrence 5 min Restoration 5 min
7	Over Current	Meter should be detected current beyond certain limit of rated value and recorded occurrence and restoration	Ix>120% of Ib	Ix< 120% of Ib	Occurrence 5 min Restoration 5 min

Sl. No.	Tamper Name	Description	Occurrence	Restoration	Persistence time
		of Over current tamper as per tamper thresholds. Events shall be detected in any phase.			
8	Current Bypass	The condition should be detected whenever the current terminal is bypassed in the meter. Meter should be detected and occurrence and restoration of current Bypass tamper as per tamper thresholds	Residual current >10% of Ib, Line current >5% of Ib, Average line current: Ignored	Residual current < 10% of Ib, Line current: Ignored, Avg Current of all 3 phases >10% of Ib	Occurrence 5 min Restoration 5 min
9	Current Open	The meter should detect phase wise current circuit open when the circuit is opened from meter side. Meter should be detected and recorded occurrence and restoration of current open tamper phase wise as per tamper thresholds	Residual Current >10% Ib Line current (Ix) <2% of Ib Average line Current: Ignored (X=r,y,b phase)	Residual Current <10% Ib Line current (Ix): Ignored, Avg Current of all 3 phases >10% of Ib	Occurrence 5 min Restoration 5 min
10	Power Fail	Meter shall detect power OFF if all phase voltages are absent. This event shall be recorded at the time with date of each power OFF. At the same time power ON event shall be recorded with date & time	if all phase voltages are absent.	Presence of any one phase	Occurrence 5 min Restoration Immediate
11	External magnetic influence	In the event of logging of presence of abnormal magnetic induction with date and time the positive variation of error may be beyond the prescribed limit as prescribed in relevant standard/CBIP-325 report with latest amendments. Meter should be detected and recorded occurrence and restoration of Abnormal external magnetic influence	Whenever the meter functionality gets affected on account of magnetic field, meter recording starts on Imax (Import as well as export mode) or it remains immune	When magnet influence stop affecting the accuracy, meter should start recording at actual load	Occurrence Within 2o sec Restoration Within 20 sec

Sl. No.	Tamper Name	Description	Occurrence	Restoration	Persistence time
		tamper as per tamper thresholds			
12	Neutral disturbance	The meter should detect neutral disturbance if any spurious signal is applied at the meter 's neutral. Meter should log the event when AC/DC/ Pulsating voltage is injected in neutral	In case any spurious signal injected to the neutral of meter, then meter will be either immune or log the event in its memory.		Occurrence 30 sec Restoration 90 sec
13	Low PF	Meter should log low power factor tamper with date and Time as per tamper threshold	Ix>10% of Ib, Vx> 75% Of Vref, Pf<0.3	Ix>10% of Ib, Vx> 75% Of Vref, Pf> 0.3	Occurrence 5 min Restoration 5 min
14	Overload	Meter should log event of overload with date & time	Power (KW) > 3X120% of IbasicX 115% of Vref	Power (KW) < 3X120% of IbasicX 115% of Vref	Occurrence 5 min Restoration 5 min
15	Meter cover opening	If attempt is made to open the meter body, the meter shall detect /log with date and time of meter body opening tamper, even in absence of supply. This tamper shall also be displayed on the meter LCD with tamper information.	On removal of meter cover	non roll over type of event. It is never restored	Occurrence Immediate Restoration – Not applicable
16	Invalid Phase Association	Meter should log the eventwith date & time when association of current phase with voltage phase is mismatched	Voltage phase R-Y-B, Current phase association is Y-B-Ror other such type combination	When Voltage and current association is proper. For example: For voltage phase R-Y-B current phase is also R-Y-B	Occurrence 5 min Restoration 5 min
17	Voltage % THD	Meter should log occurrence of high voltage harmonic event when % THD in voltage of phase will be more than threshold value. Threshold	% THD Vx> 5% of Fundamental voltage	% THD Vx< 5% of Fundamental voltage	Occurrence 5 min Restoration 5 min

Sl. No.	Tamper Name	Description	Occurrence	Restoration	Persistence time
		value should be factory			
18	Current % THD	Meter should log occurrence of high current harmonic event when % THD in current of phase will be more than threshold value	% THD in Ix>5% of fundamental. current	% THD in Ix< 5% of fundamental. current	Occurrence 5 min Restoration 5 min
19	Configuration change to metering mode i.e."Import and Export" mode to Net metering mode and forwarded to import export mode.	Meter should log the change in metering mode configuration			Immediate
20	Invalid Voltage	Missing potential should not persist. It will be occurred when change in phase angle	Vx>60% of Vref , When one phase voltage is loop with other phases	When meter connections are restored	Occurrence 5 min Restoration 5 min

Remark: Above Tamper threshold may be change as per requirements and this may be suggested by bidder and final approval may be taken by bidder from end user.

Annexure-E

TECHNICAL SPECIFICATIONS OF LASH WIRE POLYCARBONATE METER SECURITY SEALS

1. Seals should be made of high quality polycarbonate material and it should not be effected by boiling water etc. The seal must be able to withstand harsh environment indirect sunlight exposure. The seal should withstand heat resistance test at least for two Hours at 147 degree Celsius.

2. The seal should be transparent clear. The seal should be of one- piece polycarbonate body consisting of capsule and locking anchor with integrated non- magnetic & non corrosive stainless steel sealing wire.
3. Manufacturer must patent the supplied seal; so that identical seal cannot be manufactured by other manufacturer and similar type of fictitious are not available to the counterfeiters.
4. Every seal should have 20 cm long non corrosive, nonmagnetic two strand stainless steel wire (0.40/0.25mm) permanently moulded to the seal body and locking cap of seal also moulded with steel wire.
5. The seal should have high rise molded Logo of **Discoms** copy of it is enclosed and Thermo engraved sequential unique alphanumeric 7 digit serial numbers on the main body and on the cap. The sequence serial nos, logo & color if any shall be intimated separately.
6. The serial nos. should be Thermo engraved or laser engraved and printed in highly visible contrast such a way that the same cannot be manipulated by using any tool or by any chemical reactions. This should be distinct and can be easy to read without using lens. The locking cap should be same serial no thermo engraved printed in highly visible contrast.
7. The sealing arrangement should be such that its original position cannot be restored after any effort of tamper or breaking of the seals.
8. The sealing mechanism should be such that it can be sealed without using any pliers or tools. The sealing procedure must be fool proof and there should not any scope of pre tampering / malpractice with sealing wire while sealing.
9. Packaging: The seal should be supplied in packet of 100 seals. Each packet shall be labeled for following information.
   . Logo details
   . Serial Number Range
   . Quantity
10. Samples: Supplier shall submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals as per TS & drawing (dimensional) for approval before commencement of supply.
11. Test: Seal should be tested for following plastic properties. Test certificate from NABL accredited lab
    1. Heat resistance at 147 degree Celsius.
    2. Breaking strength seal shall be able to withstand a force of at Least 12.0 Kg
    3. Salt spray test.
    4. Boiling water test.
12. The seal should have following essential features.
    i. Tamper resistance
    ii. Heat resistance
    iii. Environmentally safe
    iv. Should withstand direct sun light & rain water exposure
    v. Tamper evident: Material must show clear sign of tampering such as dis-colourisation when material is compromised by Penetration, Drilling, cutting, bending or pulling etc.
    vi. One end of the wire should be loose and other end of wire should be permanently fixed on the bottom of female body of seal.
    vii. Ultra violet ray resistant.

13. **Construction:** One piece construction comprising of polycarbonate capsule & anchor and integrally connected non corrosive & non magnetic 2 strand twisted stainless steel sealing wire.
    Capsule : Contains and internal locking mechanism which accepts the anchor and permanently secure the sealing wire.
    Anchor : The locking cap shall have double Anchors, which secures the loose end of the sealing wire into the capsule locking mechanism.
    Wire : Passes through and secures the meter.
14. Marking (A) For [UTILITY],
    Logo of Discom :
    S.NO. From ---------- To ---------- to be provided on main body of seal and top cap.
    Color: Clear transparent (Color Less)

On other side of main body: Respective discom

Note:- Seal patent certificate shall be produced by the firms to ascertain the seals provided on the meter and with the meters are patented. The patented seals shall have mark of the patent seal manufacturer also in addition to the marking as per the above requirement.

Annexure-F

Meter display parameters

A) On pressing of Read push/touch button i.e., Instantaneous and billing parameters:

Sl.No.	Parameters	Units
1	LCD segment check	

Sl.No.	Parameters	Units
2	Real Time Date	DD: MM: YY
3	Real Time	HH:MM: SS
4	Rise of demand (import and export)	KVA & KW
5	Cumulative Energy (import and export)	KWH
6	Cumulative Energy (Lag) (import and export)	KVARH
7	Cumulative Energy (Lead) (import and export)	KVARH
8	Cumulative Energy (import and export)	KVAH
9	Maximum Demand (up to three decimal places) (import and export)	KVA
10	Net Active Energy (Import – Export)	KWH
11	Current R Phase	Amp.
12	Current Y Phase	Amp.
13	Current B Phase	Amp.
14	Voltage R Phase	Volts.
15	Voltage Y Phase	Volts.
16	Voltage B Phase	Volts.
17	Signed PF R phase	
18	Signed PF Y phase	
19	Signed PF B phase	
20	Signed Three Phase Power Factor instantaneous	
21	Frequency	Hz
22	Apparent Power (import and export)	KVA
23	Signed Active Power (import and export)	KW
24	Signed Reactive Power (import and export)	KVAR
25	No. of power Failure	

Sl.No.	Parameters	Units
26	Cumulative Power Failure Duration	
27	Cumulative Tamper Count	
28	Cumulative Billing Count	
29	Cumulative Programming Count	
30	Billing Date	
31	Power Factor for Billing period	
32	Cumulative active energy (import and export)	KWH
33	Cumulative active energy for TZ1	KWH
34	Cumulative active energy for TZ2	KWH
35	Cumulative active energy for TZ3	KWH
36	Cumulative active energy for TZ4	KWH
37	Cumulative active energy for TZ5	KWH
38	Cumulative active energy for TZ6	KWH
39	Cumulative active energy for TZ7	KWH
40	Cumulative active energy for TZ8	KWH
41	Cumulative apparent energy (import and export)	KVAH
42	Cumulative apparent energy KVAh TZ1	KVAH
43	Cumulative apparent energy KVAh TZ2	KVAH
44	Cumulative apparent energy KVAh TZ3	KVAH
45	Cumulative apparent energy KVAh TZ4	KVAH
46	Cumulative apparent energy KVAh TZ5	KVAH
47	Cumulative apparent energy KVAh TZ6	KVAH
48	Cumulative apparent energy KVAh TZ7	KVAH
49	Cumulative apparent energy KVAh TZ8	KVAH
50	Cumulative Maximum demand KVA (import and export)	KVA & KW
51	MD KVA for TZ1	KVA
52	MD KVA for TZ2	KVA
53	MD KVA for TZ3	KVA
54	MD KVA for TZ4	KVA

Sl.No.	Parameters	Units
55	MD KVA for TZ5	KVA
56	MD KVA for TZ6	KVA
57	MD KVA for TZ7	KVA
58	MD KVA for TZ8	KVA
59	MD reset counter	No. of reset
60	Tamper Information	First tamper occurred and Last Tamper restored, Cover open & present tamper information, Removal and reconnection of communication module
61	Cumulative Maximum Demand	KVA & KW
62	Cumulative Energy Billing (import and export)	KWH & KVA
63	Cumulative active energy for TZ1	KWH & KVA
64	Cumulative active energy for TZ2	KWH & KVA
65	Cumulative active energy for TZ3	KWH & KVA
66	Cumulative active energy for TZ4	KWH & KVA
67	Cumulative active energy for TZ5	KWH & KVA
68	Cumulative active energy for TZ6	KWH & KVA
69	Cumulative active energy for TZ7	KWH & KVA
70	Cumulative active energy for TZ8	KWH & KVA
71	Net Energy Billing (import and export)	KWH & KVAH
72	Cumulative Maximum demand Billing (import and export)	KVA
73	Billing MD date & Time	KVA
74	High resolution Active Energy (import and export) (Minimum five digit after decimal)	KWH
75	High resolution Reactive Energy (Lag) (import and export) (Minimum five digit after decimal)	KVARH
73	High resolution Reactive Energy (Lag) (import and export) (Minimum five digit after decimal)	KVARH
74	High resolution Apparent Energy (import and export) (Minimum five digit after decimal)	KVAH
75	% THD in Voltage	

Sl.No.	Parameters	Units
76	% THD in Current	
77	Diagnostic	
78	Connection status	

A) Auto Display

Sl. No.	Parameters	Limits
1	LCD segment check	
2	Real Time Date	DD: MM: YY
3	Real Time	HH:MM: SS
4	Rise of demand (import and export)	KVA & KW
5	Cumulative Energy (import and export)	KWH
6	Cumulative Energy (Lag) (import and export)	KVARH
7	Cumulative Energy (Lead) (import and export)	KVARH
8	Maximum Demand (up to three decimal places) (import and export) during the month	KVA
9	Instantaneous power factor	
10	Apparent Power (import and export)	KVAH
11	Signed Active Power (import and export)	KVAH
12	Signed Reactive Power (import and export)	KVARH
13	Billing Date	DD: MM: YY
14	Billing main active energy (import and export)	KWH
15	Billing main apparent energy (import and export)	KVAH
16	Billing TOD of Active Energy (import and export)	KWH
17	Billing MD with date and time (import and export)	KVA
18	Billing power factor	
19	Net Active Energy (Import – Export)	KWH

OFFICE OF THE MANAGING DIRECTOR
M. P. Pashchim Kshetra Vidyut Vitran Co. Ltd.
(Wholly Owned by Government of M.P. Undertaking)
GPH COMPOUND, POLOGROUND, INDORE
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(CIN: U40109MP2002SGC015121 & Email: - sepurchase06@gmail.com)

No. MD/WZ/06/PUR/TS-1941 & 1942/6433 Indore dated:- 02.04.2026

Amendment-1

Sub:-TS No. MD / WZ / PUR / 06 / 1941 (2026_MPPKV_487839_1) & TS- 1942 (2026_MPPKV_488566_1) for the RfP for the Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on Design-Build Finance-Own-Operate Transfer (DBFOOT) basis in in the area of jurisdiction of Indore Region & Ujjain Region of MPPKVVCL Indore under RDSS schemes"- **Regarding reply of pre bid queries & extension of due dates thereof.**

Ref: -

1. NIT issued vide No. MD / WZ / PUR / 06 / NIT-328/4402 dated 02.03.2026.
2. Amendment to the NIT issued vide No. MD / WZ / PUR / NIT-328/5131 Indore dated 13.03.2026.

In reference to the subject tender TS-1941 (2026_MPPKV_487839_1) & TS-1942 (2026_MPPKV_488566_1) following **Important Dates** mentioned in **Section 1. Request for Proposal Notice** of tender are hereby amended and same shall be read at all other places in the tender as follows:-

Important Dates

S.No.	Particulars	Date	Time
(1)	Last date for e-bidding	**13.04.2026**	15:00 Hrs
(2)	Date of Opening of Technical Bid (if possible)	**15.04.2026**	15:00 Hrs

Further, reply of pre bid queries are also attached here with.

All other terms and conditions of the tender shall remain same and operative.

NOTE: - Duly sealed signed copy of this **Amendment-1** please be submitted with online bid.

Chief Engineer (Purchase)
O/o MD (WZ), MPPKVVCL, Indore

02/4/26

Sr. No.	Tender Specification No.	Reference Clause No.	Reference Clause Details	Bidder's Query / request	WZ comment
1	MD/WZ/06/PUR/TS-1942	Section 2. Eligibility Requirements 8. Qualification Requirements 8.1 The technical and financial requirements of qualification are as follows: S.No: 2	Clause as Per RFP Document Sole/ Lead Bidder/ any other Consortium Member should have installed, integrated, tested, and commissioned control centre hardware (or on cloud) and application software for at least [100% of RfP] endpoints (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in last 7 (seven) years which are in operation for at least 1(one) year	Clarification Required: - Kindly confirm whether "endpoints" in this clause refer to connected field devices (e.g., smart meters, water meters, gas meters, telecom network elements, sensors, RTUs, FRTUs, AMR meters) commissioned and integrated with the control centre application, and not to consumer accounts managed by application software such as billing or CIS.	Yes, End points refers to connected field devices integrated with control centre, not to the consumer accounts managed by application software such as billing or CIS
2	MD/WZ/06/PUR/TS-1942	Section 3. Instructions to Bidders and Bid Data Sheet 29. Signing of Contract and Contract Performance Security & Section 7. Contract Forms and Conditions of Contract Performance Security	29.3 Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall furnish the Performance Security, using for that purpose the format of Performance Security given in Form 1 in Section 8. Immediately upon furnishing of Performance Security, AMISP may request the Utility to execute the AMISP Contract.	Query:- We request the Authority to kindly permit submission of Insurance Surety Bonds (ISBs) as a valid alternative to Bank Guarantees towards Contract Performance Security. This request is made in accordance with MoP Letter No. 14/13/2022-UR&SI-II-Part (1) dated 25.11.2022, which permits the use of Insurance Surety Bonds (ISBs) as a valid alternative to Bank Guarantees for Contract Performance Security. Further, the validity of the Performance Security may be considered as per MoP Letter No. REC/RDSS/AMISP/2022-23/514 dated 27.03.2023.	As per RFP
3	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 1.4 Brief Scope of Work:	i. In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).	Query: Please confirm whether this ratio is mandatory across all areas/circles, and provide estimated quantities per category for accurate planning	As per RFP
4	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 1.4 Brief Scope of Work: J	Clause as Per RFP Document J. In future, Discom is also planning to develop their new Central Repository System which will be owned by Discom, it is also responsibility of AMISP to provide necessary integration and connectivity upto Central Repository System.	Query: Whether the scope of AMISP is limited only to providing data integration, interfaces, and connectivity between the HES / MDMS and the proposed Central Repository System, while the development, ownership, hosting, and maintenance of the Central Repository System shall remain in the scope of the Discom.	The development, ownership, hosting, and maintenance of the Central Repository System shall remain in the scope of the Discom. AMISP have to provide connectivity & integration. This will not be treated as a Change Request and the time lines will be informed to successful
5	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 2.7 System Software Requirements 2.7.1.2 Applications	Clause as Per RFP Document d) Portability & Interoperability: The system shall be designed for hardware independence and operation in a network environment that facilitates interoperability and integration of third-party applications. AMI applications should support multiple Relational Database Management Systems (RDBMS) including Oracle, Microsoft SQL Server and MySQL.	Query: Please change the Clause to allow any RDBMS systems. AMI applications should support multiple Relational Database Management Systems (RDBMS) including but not limited to Oracle, Microsoft SQL Server, PostgreSQL, MariaDB and MySQL. And also, Cloud-native RDBMS.	As per RFP

18
02.04.2026

6	MD/WZ/06/PUR/TS-1942	Section 6 Project Requirements 2.2 Communication Infrastructure 2.2.1 General Requirements	Clause as Per RFP Document AMISP should provide Bluetooth enabled device on externally on optical port along with mobile app for seamless data transmission (without manual intervention) from Meter to HES.	Query: 's requested to consider, along with the Bluetooth-enabled -vice, the option of an optical cable interface to a mobile device as an acceptable method for seamless data transmission from the meter to the HES.	As per RFP
7	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 1.4 Brief Scope of Work: Sl.No : E	Clause as Per RFP Document E. Generation of automated energy audit reports (DT level/ Feeder level / Sub-division level/ Division level/ Circle) in contiguous electrical locations and other reports as per Clause 6 of this Section; (If applicable).	Query: Kindly clarify whether any existing Feeder and DT AMI/AMR system is available that can provide daily and monthly consumption data, along with consolidated and summarized event data, for the purpose of generating energy audit and reliability indices reports. If such a system is not currently available, please specify how the facilitation of feeder and DT data is envisaged by the DISCOM. Additionally, kindly indicate the approximate number of feeders and DTs proposed to be considered for the Bhopal region.	DISCOM shall facilitate access to available feeder and DT metering data through the existing systems. The approximate count of Distribution Transformers shall be shared during project implementation stage based on available records
8	MD/WZ/06/PUR/TS-1942	2.4.6 Prepaid functionality Note Point:-	Clause as Per RFP Document The frequency of pre-configured intervals shall be at least every hour in addition to that at re-charge time.	Query:- It is our submission that Prepaid billing shall be carried out at a minimum periodicity of one (1) day. Proration or apportionment of tariff components to an hourly level shall not be mandated, as such hourly-level proration may lead to operational, computational, and regulatory complexities	As per RFP
9	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 4. Consumer Indexing	Clause as Per RFP Document Either of the following checks may be done to establish the correctness of the indexing database. The selection of these methods or any other equivalent method shall be at the sole discretion of the AMISP vendor. 1. Correlation of DT wise energy loss with load flow studies; or	Query: How facilitation of DT meter data is envisioned by the DISCOM and what will be probable count of DTs for Lot-1 Indore region.	DISCOM shall facilitate access to available feeder and DT metering data through the existing systems. The approximate count of Distribution Transformers shall be shared during project implementation stage based on
10	MD/WZ/06/PUR/TS-1942	General Query		Kindly confirm whether Google Play Store and Apple App Store (iStore) developer accounts are already available with the DISCOM for hosting the consumer mobile applications.	As per RFP
11	MD/WZ/06/PUR/TS-1942	General Query		Kindly clarify whether the consumer SMS notifications shall be sent using the DISCOM's existing SMS gateway or through the AMISP's SMS gateway. Additionally, please confirm who will be responsible for the	AMISP will be responsible for managing SMS gateway service.
12	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 1.27. Customer Portal & Mobile App (Field App data handling (no local storage / sync)	Clause as Per RFP Document Once the details are captured, same should automatically sync with the central database.	Query:- Please clarify whether offline capture (temporary encrypted local cache with auto-sync) is permitted for low-network areas, and the compliance/audit expectations. This is required as many areas network will be available and we require local temporary data capture.	As per RFP

13	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 3.2 HES Integrations with Field Devices	Clause as Per RFP Document In case, utility has implemented any Service Oriented Architecture (SOA)/ Enterprise Service Bus (ESB) architecture, the data exchange to and from HES shall be through this ESB. The details of its ESB in the templated provided in Annexure G.	Query:- Kindly provide the filled Annexure G (ESB product, protocols, endpoints, security, environments) for this RFP.	Details will be shared with successful bidder.
14	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 4. Consumer Indexing	Clause as Per RFP Document If the GIS asset database is available, the verified consumer data shall be uploaded into the GIS database by the Utility for a single point of truth, presentation and secondary evaluation. If GIS is not available, then the AMISP is required to create a standalone consumer indexing database.	Query:- Please confirm whether GIS asset DB is available for the project areas, and provide access/integration method, schema and acceptance criteria.	As per RFP
15	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 2.7.7 Cyber Security – General Guidance	Clause as Per RFP Document n. AMISP shall adhere with the appropriate security algorithm for encryption and decryption as per established cyber security guidelines. For smooth functioning of the entire system, it is essential that the AMISP shall provide in the form of a document	Query:- Please clarify acceptable escrow mechanism (bank/third-party escrow/HSM/KMS), access conditions, and audit requirements.	Details will be shared with successful bidder.
16	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 7.3.3 Spares inventory	Clause as Per RFP Document As part of project implementation plan, the AMISP shall detail the spares inventory that shall be maintained for the AMI Project. These spares shall be used as and when required by the AMISP for the project and no separate charges shall be payable. The AMISP shall decide the items and components to be maintained as spare	Query:- Kindly specify minimum mandatory spares list/quantities (meters, comm modules, accessories, printers etc.) and approval mechanism by Utility.	As per RFP
17	MD/WZ/06/PUR/TS- 1942	Annexure-B, clause no 26.. METER READING INSTRUMENTS	With each lot of 1000 meters, the bidders are required to supply one number Common MRI (Meter Reading Instrument)/Mobile App free of cost. MRIs should conform to technical specification given in Section III- C & minimum Guaranteed Technical Particulars given in Schedule-II-B of this tender specification. 1 Android (Android version 12 or latest) based CMRI for 20,000 meters shall be provided by AMISP (it will be handed over to Discom along with the Set of Meters).	We understand that bidder can supply either CMRI or Mobile app as per RFP clause no 1.4 Brief Scope of Work, point no L. Providing CMRI is not mandatory. Please confirm.	CMRI App or CMRI Machine shall be permitted interchangeably, provided that the prescribed quantities and functional requirements are duly met
18	MD/WZ/06/PUR/TS- 1942	clause no 1.4 Brief Scope of Work of section-6	i. In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).	Please amend as i. In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp)/(20- 100Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).	Accepted
19	MD/WZ/06/PUR/TS- 1942	Form 23 of section 4	17. In consideration of the selection of the bidder by the Utility, ...	Sr. No are starting from 17 instant of 1 in Form-23, kindly confirm.	Amended, Serial Numbers shall be considered as starting from 1.

20	MD/WZ/06/PUR/TS- 1942	Clause no 1.2 of Section 6 : The AMI Project Area	The AMI Project shall be implemented in the Project Area comprising of.....	Please provide the complete details i.e Zone wise, meter wise Quantity required for contingency and non-contingency.	Details will be shared with successful bidder.
21	MD/WZ/06/PUR/TS- 1942	Section - 3, ITB : clause no 25.1.2 Start Price & Decrement	b) The minimum decrement value will INR 5 Cr. Bidders shall be able to reduce their price only by a minimum decrement or its multiples.	Minimum decrement value is approx. 0.4% to 0.5%, which is very higher side, hence request you to limit the minimum decrement value upto 0.1% as per prilimary practice across India.	As per RFP
22	MD/WZ/06/PUR/TS- 1942	Data Concentrator Unit (DCU) (if applicable) 1. Configuration, Functionality & Interface	DCU shall ensure a secure communication to HES and shall have internal memory for storing interval data for at least 5 (five) days.	We have indigenous RF Gateway in place of RF DCU. It is transparent and did not collect the data rather it sends the data directly to the HES via WAN	As per RFP.
23	MD/WZ/06/PUR/TS- 1942	2.2.4 Communication Network Elements	2.2.4.1.1 (d) DCU shall have built-in Real Time Clock (RTC) with separate battery backup. It shall have self- diagnostic feature for RTC, memory, battery, communication module, etc.	Genus gateway have built-in Real Time Clock (RTC) and the separate battery backup for 1 hr. It also have the self-diagnostic feature for RTC, battery, communication module, etc.	As per RFP.
24	MD/WZ/06/PUR/TS- 1942	Annexure E Part II	Communication interface: The meter shall provide a 14-pins Female socket connector (2*7pin, 2.54mm).	The meter shall provide a 12-pins Male connector for 1P and 16-pins Male connector for 3P. Gateway have 16-pins Female socket connector	As per RFP.
25	MD/WZ/06/PUR/TS- 1942	1.4 Brief Scope of Work	General Queries	Please clarify the statement "2 different TSPs SIMs in cellular or RF communication"	As per RFP.
26	MD/WZ/06/PUR/TS- 1942	1.4 Brief Scope of Work	In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp)	Kindly clarify whether Three Phase Smart Meter with current rating 20–100 A is acceptable in place of 10–100 A	Three Phase Smart Meter with current rating 20-100 A or 10-100 A is acceptable
27	MD/WZ/06/PUR/TS- 1942	1.4 Brief Scope of Work: A (k)	The AMISP shall use the alternate SIM cards from minimum 2 Service providers for data transfer from DCU/Router/Gateway to HES and shall bear the recurring charges for 4G/5G SIMs /MPLS connectivity/Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide 2 different telecom service provider SIMs	Kindly clarify acceptability of 4G SIMs in place of 4G/5G and confirm the exact requirement for deployment of two different TSP SIMs to avoid ambiguity in recurring connectivity costs	As per RFP.
28	MD/WZ/06/PUR/TS- 1942	1.4 Brief Scope of Work: A (n)	The AMISP has to provide Smart Meters with ToDs (Import & Export) in their Display Parameters, ToD (Import & Export) values in Daily profile & Billing data of Head-End-System (HES). Further, AMISP has to make provisions in the Mobile Application for replacement of Old legacy meter to Smart Meters wherein ToD (Import & Export) wise Start Reading along with CKWH shall be available in their aforesaid App for data transfer from DCU/Router/Gateway to HES and shall bear the recurring charges for 4G/5G SIMs /MPLS connectivity/Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide 2 different telecom service provider SIMs	Scope mentions ToD Import/Export display in meters, HES, and Mobile App along with legacy meter replacement. Kindly clarify: 1. Format of ToD data in HES and App. 2. Whether legacy meter start readings (ToD-wise) are mandatory for all consumers or only selected locations.	As per RFP; Responsibility lied with AMISP.
29	MD/WZ/06/PUR/TS- 1942		General Queries	Please share the meter class of HT smart meters - 0.5 or 0.2	For HT connection 0.5s & for EHV connection 0.2s
30	MD/WZ/06/PUR/TS- 1942		General Queries	Please share the base current for HT smart meters - 1A or 5A	for HT connection 5 amp & for EHV connection 1 Amp

31	MD/WZ/06/PUR/TS- 1942		General Queries	Please share the scope of meter box required in HT smart ters	Meter box is not in the scope of AMISP
32	MD/WZ/06/PUR/TS- 1942		General Queries	Please share the meter wise exact bifurcation of 100/5 and 200/5 LT smart meters	Shall be Shared to Successful bidder
33	MD/WZ/06/PUR/TS- 1942		General Queries	Profile parameters are shared in RFP document and Mandatory parameters & missing/shortfalls parameters are shared separately. Please clarify do we need to use the combination of these.	As per RFP.
34	MD/WZ/06/PUR/TS- 1942		General Queries	There is no requirement of ABT meters in the RFP document but profile parameters are shared. Please share the significance of these parameters	As per RFP.
35	MD/WZ/06/PUR/TS- 1942		General Queries	Please share is there any scope for offline recharge centres	No infrastructure for offline recharge through feature phones / Kiosk is required to be deployed under this tender
36	MD/WZ/06/PUR/TS- 1942		General Queries	Please share the scope of CT/PT unit required in HT smart meters	Not in the scope of AMISP
37	MD/WZ/06/PUR/TS- 1942	Firewall and intrusion protection system	Firewall and intrusion protection system	Please share the detail specification & requirement of Firewall and intrusion protection system	As per RFP
38	MD/WZ/06/PUR/TS- 1942	2.2.4.1.2 Configuration, Functionality & Interface of DCU	• DCU shall ensure a secure communication to HES and shall have internal memory for storing interval data for at least 5 (five) days.	We have indigenous RF Gateway in place of RF DCU. It is transparent and did not collect the data rather it sends the data directly to the HES via WAN	As per RFP.
39	MD/WZ/06/PUR/TS- 1942	2.2.4 Communication Network Elements	2.2.4.1.1 (d) DCU shall have built-in Real Time Clock (RTC) with separate battery backup. It shall have self- diagnostic feature for RTC, memory, battery, communication module, etc.	Our proposed gateway don't have built-in Real Time Clock (RTC) but have the separate battery backup for 1 hr. It also have the self- diagnostic feature for RTC, battery, communication module, etc.	As per RFP.
40	MD/WZ/06/PUR/TS- 1942	Annexure F Part II	**Communication interface:** The meter shall provide a 14-pins Female socket connector (2*7pin, 2.54mm).	The meter shall provide a 12-pins Male connector for 1P and 16-pins Male connector for 3P. Gateway have 16-pins Female socket connector	As per RFP.
41	MD/WZ/06/PUR/TS- 1942		General Queries	Profile parameters are shared in RFP document and Mandatory parameters & missing/shortfalls parameters are shared separately. Please clarify do we need to use the combination of these.	As per RFP.
42	MD/WZ/06/PUR/TS- 1942		General Queries	There is no requirement of ABT meters in the RFP document but profile parameters are shared. Please share the significance of these parameters	As per RFP.
43	MD/WZ/06/PUR/TS- 1942	12. Proposal / Bid Validity& Bid Security-	12.1 The Bid/ Proposal submitted by the Bidder(s) shall be valid for a period of specified in BDS reckoned from the Bid Submission Deadline specified in ITB 17 as may be extended from time to time.	Please define Bid validity as its strike through in BDS	Bid validity will be 300 (180 + 120) Days
44	MD/WZ/06/PUR/TS- 1942	20. Bid/ Proposals Evaluation Overview and Verification/ Clarifications-	Second Stage-Opening of Financial Bid: Financial Bids of all technically qualified Bidders would be opened, basis which the award of AMISP Contract shall be determined.	Kindly amend as that award if AMISP contract will be decided based on result of reverse auction instead of price quoted in financial Bid	Agreed for change in language, AMISP contract will be decided based on result of reverse auction

45	MD/WZ/06/PUR/TS- 1942	22. Opening of Financial Proposals-	22.2 The Financial Bids shall be opened through the e-Procurement system referred to in ITB 2.2, in the presence of authorized representatives of all technically qualified Bidders who chose to be present at the specified venue on the specified date and time.	We Understand that Financial Bid opening will be confident ion considering provision of reverse auction	As per RFP
46	MD/WZ/06/PUR/TS- 1942	25.1.1 Process of Reverse Auction-	25.1.2 Start Price & Decrement- b) The minimum decrement value will INR 5 Cr. Bidders shall be able to reduce their price only by a minimum decrement or its multiples.	Requesting you to kindly reduced increment to 0.1 % of Reverse auction starting price in line of Industry practice as given 5 CR decrement is 0.33% for tender 1647 & 0.38% for Tender 1648 (of estimated value)	As per RFP
47	MD/WZ/06/PUR/TS- 1942	25.1.1 Process of Reverse Auction- 25.1.2 Start Price & Decrement	**c)** The initial auction period will be 30 minutes (thirty minutes) with a provision of auto extension by five minutes from the scheduled / extended closing time if any fresh bid is received in last five minutes of auction period or extended auction period. Such auto extensions shall be effective only if, reduction in rate by a Bidder.	Please amend as initial auction period will be 60 minutes.....in line of standard industrial practice	As per RFP
48	MD/WZ/06/PUR/TS- 1942	ITB Reference A. General Provisions-1 (mm)-	vi. Generation of automated energy audit reports	Please remove generation of automated energy audit reports from scope of bidder considering Feeder meter not in scope of RFP else please advise where & how to fetch data of Feeder meter in project area	Energy Audit is within the project scope and shall be carried out through integration of available Feeder and DTR meter data.
49	MD/WZ/06/PUR/TS- 1942	Form 7: Format of Covering Letter by Sole bidder/ Lead Consortium Member-	1. 11. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of 1 (one) year from the Bid Submission Deadline.	Please amed as We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of 180 days from the Bid Submission Deadline in line of Bid validity.	Bid validity will be 300 (180 + 120) Days
50	MD/WZ/06/PUR/TS- 1942	Table 6:	List of Materials and Services for Infrastructure for Recharge through Feature Phones/ Offline Channels [Indicative Only. To be defined by AMISP]	Please clarify requirement related to Recharge through Feature Phones/ Offline Channels as looking at RFP its seems is not in scope	Yes, no infrastructure for offline recharge through feature phones / Kiosk is required to be deployed under this tender
51	MD/WZ/06/PUR/TS- 1942	1. Overview of the AMISP Scope of Work-	1.4 Brief Scope of Work h. Installation of LTCT meters to LTDB/Fuse Box, wherever applicable. Material, tools and other accessories (not covered in BoQ) required for dismantling, civil work and installation of the new meter, shall also be in the scope of AMISP	Please confirm whether Installation of LTCT meters to LTDB/Fuse Box is applicable or not if yes for how many quantity please confirm. We understand that Power cable is not cover in AMISP scope its scope is limited to Meter to Ct cable	As per RFP
52	MD/WZ/06/PUR/TS- 1942	1. Overview of the AMISP Scope of Work- 1.4 Brief Scope of Work:	For every 50,000 meters, one workstation console needs to be provided by AMISP. For every 50,000 meters, one workstation console (Including Desktop, Office Table, Chair and 2 visitor Chairs) needs to be provided by AMISP will be provided extra as the material related to NOMC.	We understand that For every 50,000 meters, only one workstation console needs to be provided by AMISP as the material related to NOMC instead of 2 workstation as 1 workstation is coming twice in same clause & Workstation related requirement given in clause2.6.2 @ Page no 187 is need not to provide please confirm	As per RFP
53	MD/WZ/06/PUR/TS- 1942	1. Overview of the AMISP Scope of Work- C. Consumer indexing on de-novo basis for (wherever applicable)-	ii. Non-contiguous electrical locations as mentioned in Clause 1.2 (C), i.e., Consumer indexing with DTs on de-novo basis along with its regular updates during contract period as per Clause 4 of this Section; and feeder to DT indexing on de-novo basis for all DTs in along with its regular updates during contract period as per Clause 4 of this Section."	Please remove requirement related to feeder to DT indexing on de-novo basis for all DTs in along with its regular updates during contract period as Feeder meter is not in scope in this RFP	Energy Audit is within the project scope and shall be carried out through integration of available Feeder and DTR meter data with corresponding indexing.
54	MD/WZ/06/PUR/TS- 1942	1. Overview of the AMISP Scope of Work-	E. Generation of automated energy audit reports (DT level/ Feeder level / Sub- division level/ Division level/ Circle) in contiguous electrical locations and other reports as per Clause 6 of this Section; (If applicable)	Please remove generation of automated energy audit reports from scope of bidder considering Feeder meter not in scope of RFP else please advise where & how to fetch data of and Feeder meter in project area	Energy Audit is within the project scope and shall be carried out through integration of available Feeder and DTR meter data with corresponding indexing.

55	MD/WZ/06/PUR/TS- 1942	1.12 Responsibilities of the Utility-	s) Ensure that sites for installation for Smart Meters are ready along with service cable including electrical neutral connectivity to the transformer, wherever applicable, for AMISP;	We Understand that installation of service cable whare when ever require will be done by utility	Service cable will be in the Scope of Discom
56	MD/WZ/06/PUR/TS- 1942	1.12 Responsibilities of the Utility-	x) iii.Give access to AMISP to use existing power and water supply, and other necessary equipment, as mutually agreed with the AMISP;	we understand that existing power and water supply will be at free of cost basis	As per RFP
57	MD/WZ/06/PUR/TS- 1942	2. Supply, installation, integration, testing and commissioning of:2.1 Smart Meters-	The AMISP shall supply, install, integrate and commission smart meters of different types, the estimated number of which is given in the Bill of Material, in the Project Area throughout the Contract Period.	Please provide number of meter consider for future requirement in this RFP as its seems quantity given is BOQ including future requirement along with current requirement	As per RFP
58	MD/WZ/06/PUR/TS- 1942	2. Supply, installation, integration, testing and commissioning of:2.1 Smart Meters-	In future, it would be AMISP's responsibility to integrate new meter in consultation with Utility or facilitate integration of other application as per the approach paper submitted under the Project Implementation Plan.	We understand that new meter will be introduce by AMISP only	As per RFP
59	MD/WZ/06/PUR/TS- 1942	4. Consumer Indexing-	If the GIS asset database is available, the verified consumer data shall be uploaded into the GIS database by the Utility for a single point of truth, presentation and secondary evaluation. If GIS is not available, then the AMISP is required to create a standalone consumer indexing database. This database of electrical indexing shall have the following broad parameters:	Please confirm GIS asset database is available or not	Available data will be shared to AMISP after LoA
60	MD/WZ/06/PUR/TS- 1942	(b) Payment Mechanism-	**5.2 PAYMENT MECHANISM-5.2.7** In order to ensure adequate funds for timely payment to the AMISP, the Utility shall ensure an Escrow account so created, which will at all times maintain 5 times of the monthly payment to the AMISP during the entire tenure of the Contract. All costs relating to opening, maintenance of the Escrow account shall be borne by the Utility.	Requesting to you please include direct debit machinsum instead of escrow in line of SBD	As per RFP
61	MD/WZ/06/PUR/TS- 1942	(b) Payment Mechanism-	(b) Payment Mechanism-5.2 PAYMENT MECHANISM-5.2.11- AMISP shall be required to replace the Smart Meter no later than 15 days of notification by the Utility.	Please amend as -AMISP shall be required to replace the Smart Meter no later than 45 days of notification by the Utility.	As per RFP
62	MD/WZ/06/PUR/TS- 1942	(b) Payment Mechanism-	(b) Payment Mechanism-5.2 PAYMENT MECHANISM-5.2.13-In case Utility fails to clear any payment (including disputed amount) of the AMISP within 60 (sixty) days of receipt of invoices, interest on the delayed payment shall be applicable as mentioned in Article 5.2.14 of the Contract.	Please amend as In case Utility fails to clear any payment (including disputed amount) of the AMISP within 45 (fourth five) days of receipt of invoices, interest on the delayed payment shall be applicable as mentioned in Article 5.2.14 of the Contract. in line of (b) Payment Mechanism-5.2 PAYMENT MECHANISM-5.2.7	As per RFP
63	MD/WZ/06/PUR/TS- 1942	(b) Payment Mechanism	(b) Payment Mechanism-5.2 5.2.17 Additional Payment structure:	We understand that payment for "In the event a Smart Meter supplied and installed by the AMISP is damaged for reasons not attributable to the AMISP such as theft, vandalism, burning, etc. or as a result of Force Majeure Event" will be mutually agreed between AMISP and the Utility and it will not govern by (b) Payment Mechanism-5.2 5.2.17	As per RFP
64	MD/WZ/06/PUR/TS- 1942	Performance Security	**Performance Security-6.1** The initial performance security submitted by the Selected Bidder at the time of contract signing shall be valid for a period of at least 6 months beyond the end of the installation milestone.	Please incorporate insurance surety bond also as a performance security inline of REC Letter No: REC/PMD(RDSS)/2024-25/18 on dated 08.12.2025	As per RFP
65	MD/WZ/06/PUR/TS- 1942	Form 1	Form 1: Format of Performance Security	Please incorporate insurance surety bond also as a performance security inline of REC Letter No: REC/PMD(RDSS)/2024-25/18 on dated 08.12.2025	As per RFP
66	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),GTP Sr.No.21	Fixing/sealing arrangement i) Fixing of meter: 3 fixing holes (one at top & two at bottom terminal block)	3 fixing holes (one at top and two at lower sides of the base) under sealable terminal cover, we understand the above is also fulfil the requirement, kindly accept.	As per RFP

67	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FO DLMS COMPLIANT CATEGORY-D-2 (Thre Phase Whole Current Meter 20-100A),GTP Sr.No.21 (ii) 100A	ii) Sealing of meter cover to Base: 2 nos., tightening from rear	2 nos sealing screw will be tight from the front side. ad portion inside base casing. Kindly accept.	As per RFP
68	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),GTP Sr.No.22 (100A)	Type of hinged undetachable terminal cover & size/ thickness of hinges: Book (Door) type opening	T-Cover is flush type and detachable opening. This type already accepted in 60A meter specification. Kindly accept.	Shall be accepted as per design of meter
69	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),GTP Sr.No.70 (100A)	Category UC1	Please accept UC1 or better	Shall be accepted for higher current rating UC1 or better
70	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),5.7 (60A) & (100A)	C) View Parameters (display/information required through MRI/BCS/ AMR) shall be as per IS:16444 with latest amendments.	We are requesting you to please accept Android base mobile app or CMRI/HHU.	CMRI App or CMRI Machine shall be permitted interchangeably, provided that the prescribed quantities and functional requirements are duly met
71	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),5.10 Load Survey (100A)	As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering	This is typographical error this is WC 10-60A meter specification so cat-D2 will be comply.	Load survey parameters shall be as per D3 category
72	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),Note : Page No.21 (100A)	1. The measurement by meter shall not get influenced by injection of AC Voltages/ chopped signal/ DC signal and harmonics on the outgoing leads of the meter or if get affected it will log the ND event &do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. When AC voltage chopped in the neutral circuit and the meter voltage increases above 300 V, all three phase relays should be disconnected in this condition to prevent drawing a load from phases. Recording and indication of tamper must occur under this condition.	the meter voltage increases above 300 V , all three phase relay will be disconnected and in that condition deficiency metering will be not possible. Kindly consider and confirm.	As per RFP
73	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),7.1 (100A)	In addition reset of maximum demand shall be possible through push button or through a **hand held terminal** capable of communicating with the meter.	Please accept Mobile app or hand held terminal.	In addition reset of maximum demand shall be possible through push button **and** through a hand held terminal/**Mobile App** capable of communicating with the meter.
74	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),Clause No. 9 (100A)	A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition. The maximum drift in real time internal clock of meter shall not **exceed ±60 seconds per year when powered by internal battery or supply.**	Internal clock accuracy of the meter will be as per CBIP 325 which is Max. Drift 03 minutes. Kindly accept.	As per CBIP

75	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Thr Phase Whole Current Meter 20-100A),11.2 (100A)	Meters shall have two number galvanically isolated ports one for collection of data for load survey and other parameters through the meter reading instrument which can also be subsequently connected to a GSM/GPRS/RF Media for remote metering and other for remote meter reading purpose only. The load survey port shall have optical coupler for transfer of data from meter to the meter reading instrument or modem "as the case may be. In addition to this load survey port, provision shall be made for another D- port, which will be permanently hooked to the meter reading instrument or modem as the case may be. In addition to this load survey port, Provision shall be made for another D- port, which will be permanently hooked to the The other D-post is exclusively for remote meter reading purpose and communication to the meter through this port for programming purpose should not be Possible	As per IS-16444 with latest amendment we will vide 02 nos. communication mode. (i) inbuilt port GPRS/RF module (ii)Optical for local Data downloading Please accept.	Acceptable, as per IS 16444
76	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),14.1 (100A)	The holes for lead sealing wire may be 2mm one hole should be provided in the head and one in the threaded portion and as per meter design necessary approval may be taken from competent authority. Each sealing screw having 2 hole on Head Portion. Hole in thread portion not due to screw thread must be enclosed in Meter Body. Sealing screw must tighten from Top Cover to base.	Sealing screw having one hole in the Head portion. Threaded portion of the sealing screw will be inside the base casing. Kindly accept the same.	As per RFP
77	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),19.1 (100A)	**CRIMPING LUGS** :- With each whole current meter 8 nos. copper lugs matching with terminal hole size shall be provided.	Please accept it copper/Aluminium lug of suitable size.	As per RFP
78	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),Schedule-IV(D) VERIFICATION / TESTING OF METERS SUPPLIED Page No.35 1P,3PWC,3P LT-CT	The selected samples shall be sent with complete details for type test and additional test/special tests and DLMS conformance test as per specification at CPRI, Bhopal/any third party NABL accredited test lab. The type test charges shall be borne and deposited by the supplier." The detailed procedure is explained hereunder.	All type test and additional test reports and DLMS conformance test certificate already taken by supplier. then why the type test charge shall be borne by supplier. this charge should be scope of utility.	As per RFP
79	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),Meter Box Cl. No. 2	The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 deg. cent.	The engineering plastic used shall conform to IS: 11731	As per RFP
80	MD/WZ/06/PUR/TS- 1942	Annex-B_TECHNICAL SPECIFICATIONS FOR DLMS COMPLIANT CATEGORY-D-2 (Three Phase Whole Current Meter 20-100A),Seals Clause No.4. (60A) &(100A)	Every seal should have 20 cm long noncorrosive, non-magnetic two strand stainless steel wire (0.40/0.25mm) permanently moulded to the seal body and locking cap of seal also moulded with steel wire.	Twisted 2 strands Seals wire dia is 0.9±0.1mm is to be used, kindly accept.	As per RFP
81	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,14.1	The minimum character height shall be 8.5 mm for whole digits of kWh Display.	Please accept that the character height will be 5 × 3 mm, and the numeric seven-segment digit height will be 10 mm	As per RFP
82	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Material Used for Meter case and Hinge type Meter Box:(v)	The terminal inserts shall be of heavily tinned brass/ nickel or silver plated copper, zinc plated steel.	Please accept heavily Nickel plated brass/tinned brass/ nickel or silver plated copper, zinc plated steel.	Nickel plated brass shall also be accepted

83	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,. SAL FEATURES 37.12	The meter shall have min 7 digits with '-' indication. Without indication indicates '+'. , parameter identifier, backlit Liquid Crystal Display (LCD) of minimum 10 mm height, wide viewing angle.	Please accept that we will provide a 7-digit display. The first 6 s will be of size 10 × 5 mm, and the last (7th) digit will be smaller, of size 5 × 3 mm."	As per RFP
84	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No.16.1 (d) Page No. 7	Common Meter Reading Instrument (CMRI) to be supported for all category single phase and phase meters: The CMRI shall have possibility to read both communication types of meters purchased by [utility] – optical port [utility] shall exchange reading EXE file for the CMRI of successful bidders. The CMRI without IRDA port shall be accepted. The CMRI shall be able to read from optical port shall exchange reading EXE file for the CMRI of other successful bidders.	The Mobile app/CMRI will have capability to read the meter on optical port only.	For clarification, an external device can be connected externally on optical port for data transfer through mobile app or any other Bluetooth enabled device
85	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,21. BASE COMPUTER APPLICATION SOFTWARE to be supported by all category of single and three phase meters Page No. 09	01 (one) CMRI shall be supplied with each lot of 20000 nos. of meters along with battery charger. Android (Android version 12 or latest) based CMRI, 1 per 20,000 meters shall be provided by AMISP (it will be handed over to Discom along with the Set of Meters).	Please accept Mobile app/ hand held terminal.	For clarification, an external device can be connected externally on optical port for data transfer through mobile app or any other Bluetooth enabled device
86	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 26.1 Page No. 14	The terminals may be grouped in a terminal block having adequate insulating properties and mechanical strength. The terminal block should be made from best quality non-hygroscopic, flame retardant material (capable of passing the flammability tests given in IS:11731) with nickel plated brass or equivalent or better material for connecting terminals. It shall be an integral part of the meter base.	Terminal block is separate part to the base, that is mounted on meter base with proper fixing arrangement, it cannot be separate from the base without breaking the meter and it is the integral part of the base.	As per RFP
87	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 14.1 Page No. 05 & GTP Sr.No. 13 (i)	The LCD shall be of STN (Super Twist Nematic) type designed suitably to withstand temperature of 80oC (storage) & 65oC (operation). The LCD shall be of HTN (high twisted nematic). Operation suitability LCD suitable for operation up to 80oC	Both points are controversial we will provide as per specification The LCD shall be of STN (Super Twist Nematic) type designed suitably to withstand temperature of 80oC (storage) & 65oC (operation). The LCD shall be of HTN (high twisted nematic).	As per RFP
88	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 26.4 Page No. 15	The terminals shall be of suitable rating to carry 200% of Imax and shall be made of electro plated (or tinned) brass.	Terminals will be of suitable rating to carry 120% of Imax will be nickel plated brass/electro plated (or tinned) brass.	As per RFP
89	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 26.8 Page no. 15	TERMINAL BLOCK COVER:- The terminal block cover for the energy meters shall be provided transparent type having hinge, which can be sealed independently of the meter cover. The Extended Terminal Block Cover (ETBC) shall have a clear space of at least 25 mm, thus allowing sufficient clearance space for inserting cables. The terminals, their fixing screws and the insulated compartment housing them with meter fixing arrangement on the base of meter box shall be enclosed by extended terminal cover in such a way that no part of meter or accessories at terminal block shall be accessible from the front of the meter.	Please accept T-Cover is flush type and detachable opening. And we will provide suitable for 5-30A meter 25mm +/-5mm.	As per RFP
90	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 33.2 Page No 16	At-least two sealing screws of Nickel plated steel / brass shall be provided for proper fixing of meter body (cover & base). Each sealing screw shall have two independent sealing holes. One hole should be provided in the head and one in the bottom portion. The diameter of the hole shall be 2.0 mm & 1.5 mm for the head and thread portion respectively.	The sealing screw having 1 no. hole on the head portion with 2mm diameter. It will be tight from Top to bottom side only.	Shall be accepted as per design of meter

91	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clau. No. 35.3 Page No. 18	**Neutral missing/Disturbance-** **(a) In the event of disconnection of neutral from incoming side and outgoing side.**- The meter shall record energy proportional to the current and rated voltage with Unity pf when any of the enclosed tamper circuits are used to tamper energy by more than 10% using a diode in both polarity, or a variable resistance or a variable capacitance. The meter will be tested in these conditions such that the measured terminal voltage is reduced by 10%, 20% and 30% of rated voltage. The meter accuracy at 0.25 lag and 0.5 lead power factor shall be verified immediately after this test. The voltage threshold below which the recording should start at Vref , UPF and actual load is 90% of 240 volts i.e. 216 volts; meter shall record Neutral disturbance tamper. The testing shall be done as specified.	W... request you to kindly accept the accuracy +/- 3% of the ...er in case of single wire/ Neutral disturbance tamper condition.	As per RFP
92	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 35.3 Page No. 18	(b) The single phase meter should register energy even if the incoming phase and neutral terminal of the meter are connected together and load is connected on both phase and neutral or either of the two element of the meter separately and is being run through earth then meter should record energy as per actual current drawn (sum of the currents).	In that condition, Current threshold should be greater than 1 Amp in each element of the meter (Phase and Neutral).and metering will Vref.*actual current (sum of the both current *UPF and error will be +-3%)	As per RFP (Sum of current shall be equal or greater than 20% of Ib)
93	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No. 36 Page No. 20	Neutral disturbance event to be record in case of Earth Tamper condition in Three phase meter specifications. (iv) Power supply ON and Phase indication - LED or ICON on LCD for line 1, 2 & 3 or information on LCD like backlight on, value of supply voltage etc.	May be above the requirements are not for Single phase meter. Kindly clarify.	As per RFP
94	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Clause No.39.2 Page No. 22	The offered whole current meter shall also withstand DC Immunity test for main and neutral circuit at Iref = Imax/ root 2 as per IS:16444 so as to ensure that the meter current circuits do not saturate on passing of direct current.	We request you to kindly accept DC immunity test as per IS 16444 Part 1 which is applicable for main element. Kindly accept.	As per RFP
95	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Schedule-IV(D) VERIFICATION / TESTING OF METERS SUPPLIED Page No. 32	The selected samples shall be sent with complete details for type test and additional test/special tests and DLMS conformance test as per specification at CPRI, Bhopal/any third party NABL accredited test lab. The type test charges shall be borne and deposited by the supplier."	For the lot accepted SBD permit sampling for type/acceptance test for the max. of six lot. It help bidder to load the testing charges accurately. kindly consider	As per RFP
96	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,GTP – Sr. No. 7 Page No. 34	Starting current at which meter shall run & continue to run Starting current at which meter shall run & continue to run – 0.4%of Ib at rated voltage and unity power factor & continue to run at 60 A	We request you to kindly accept the current value, continue to run at 30 Amp because meter current rating will be 5- 30 Amp.	Shall also be accepted
97	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,GTP – Sr. No. 30 Fixing arrangement of name plate and 9(d) Page No. 37	Plastic nameplate fixed in side the meter. It should contain all the details as per ISS . Meter cover shall be fully transparent	Name plate details shall printed on the top cover of the meter. Kindly permit.	Shall also be accepted as per design of meter

98	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,GT Page No. 39	39 Load Survey/Interval Data As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load Profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days. By default, LS parameters shall be with 15 Min. integration period. In addition to that Instantaneous parameter (IP data) shall also be captured on every 15 min interval at HES level.	e requirement for the LTCT Meter, single phase meter, Load survey data will be applicable as per IS 15959 Part 2/ IS 16444 Part 1.	As per RFP (Load survey data shall be D3 category type meter)
99	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,Schedule-IV(B), Box Cl. No. 2 Page No. 29	The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 deg. cent.	The engineering plastic used shall conform to IS: 11731	As per RFP
100	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,HINGE TYPE METER BOX Page No. 30	13.0 The overall dimensions of the meter box shall vary according to the different make of meters. However, it shall comply with the minimum requirements as described above.	As per given dimension suitable for genus make meter.	As per RFP
101	MD/WZ/06/PUR/TS- 1942	Annexure-A Technical specification Consumer metering (5-30)A Meter,2.2.1 General Requirements of Section-6	AMISP should provide Bluetooth enabled device externally on optical port along with mobile app for seamless data transmission (without manual intervention) from Meter to HES.	We will provide inbuilt Bluetooth functionality in the meter hardware. Kindly accept the same	As per RFP
102	MD/WZ/06/PUR/TS- 1942	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s,View Parameters (display/information required through MRI/BCS):	C) View Parameters (display/information required through MRI/BCS):- i) Vector Diagram of all 3 phases ii) Instantaneous parameters as per table 1 of IS 15959 part3 iii) Load Survey parameters as per table 2 of IS 15959 part3; There should be provision to select which load survey parameters is to be viewed	Please accept local data downloading thru android mobile app/BCS.	For LTCT local communication shall also be accepted through mobile app and BCS
103	MD/WZ/06/PUR/TS- 1942	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s,23 CONNECTION DIAGRAM & TERMINAL MARKING:	The holes for lead sealing wire may be 2mm one hole should be provided in the head and one in the threaded portion	Sealing screw having one hole in the Head portion. Threaded portion of the sealing screw will be inside the base casing. Kindly accept the same.	Shall also be accepted as per design of meter
104	MD/WZ/06/PUR/TS- 1942	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s,22.3	The poly carbonate meter body, the cover shall be permanently ultrasonically welded with the base.	Meter cover and base will be chemical welding.	As per RFP
105	MD/WZ/06/PUR/TS- 1942	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s,12(i)	In actual field conditions, there are cases where the meter has to work under single wire condition. Event shall be recorded. It shall work on single wire condition and event shall be recorded in the meter with date and time.	single wire feature not applicable for three phase meter.	As per RFP
106	MD/WZ/06/PUR/TS- 1942	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s,28.1	With each meter suitable 10 Nos. copper lugs matching with terminal hole size shall be provided	Please accept it copper/Aluminium lug of suitable size.	As per RFP
107	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,1.4	Bidder shall also provide four no. Epoxy Resin Cast CTs, control cables, clamps, terminal block, etc. as required. Note that a TTB is not required for LTCT meters.	Please confirm Why additional terminal block is required? Please clarify.	As per RFP (It is mentioned in clause such that TTB is not required for LTCT meters)

108	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,2.1	The overall dimension of double compartment Box to accommodate a L.T. C.T. Operated three phase four wire Static Energy Meter, with Modem in upper compartment and four CTs. in lower compartment should be as below:- Overall dimension: 850x350x230	Additional Modem, Antenna & TTB not required; Can propose SMC box with overall inner dimensions: 750x350x170mm (Tolerance +/- 5%) Please accept box dimension as 845x345x257mm (Tolerance +/- 5%)	As per RFP
109	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (i)	**Viewing Window:**he viewing window made up of a scratch and break resistant, UV resistant, transparent polycarbonate and shall be provided on the door for reading the meter without inconvenience. The minimum thickness of the viewing window shall be 2.0 mm. The window shall be ultra-sonically welded / window is tightened with the frame of same material and this arrangement shall ensure ingress against of water & dust inside the box. There should not be any ingress of moisture through this window into the box OR in case of toughened glass fixing arrangement may be provided as per design. The viewing window to be tightened with the frame of same Material and this arrangement shall ensure Ingress against of water & dust inside the confirm Box.	Toughened glass window tightened with PC material frame please accept.	shall be accepted for Toughened glass window tightened with PC material frame other conditions remain same
110	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (ii)	The hinges of the door should be concealed and they shall be fixed to flanges provided to the base and cover of the box in such a manner that the door opened by minimum 120 degrees.	Please accept Opening by 120±10degree.	Shall also be accepted
111	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (iii)	**Earthing Bolt:** M8x40mm M.S. Bolt with 2Nut,4plain & 1 spring washer will be provided	**Please accept Earthing Bolt size:** M8x30mm/40mm	As per RFP
112	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (iv)	The meter box shall have 4 Nos. of wall mounting bracket made out of SMC with proper screw to fix with the bottom base and provision and provision for 6 mm. dia-hole for mounting the SMC Meter Box/ wall Mounting brackets made out of M.S. material for mounting the box on pole, which shall hold the weight of the box while clamping on a Pole with suitable screws. Mounting Brackets made out of M.S. Material for Mounting the Box on Pole	We are proposing 04nos circular hole of min 8mm dia for Wall Mounting instead of wall mounting bracket & Metal clamp with pole strip for Pole mounting arrangement.	As per RFP
113	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (v)	Suitable handle/ knobs shall be provided on both the doors.	We will offer U-latch profile can be used as a handle to open/close	U latch profile shall also be accepted
114	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (viii)	In case of consumer LT CT Meter: 1 Nos. hole size 2½ inches with superior quality rubber cable glands shall be provided on incoming side and 4 Nos. holes with superior quality rubber cable glands shall be provided on other side of the lower compartment of the box for cable entry.	As per specs Guideline Box. 4 glands on each side to accommodate max cable size of 240sq mm is sufficient. We are proposing 4 Nos. holes with Suitable Plastic cable Gland provided according to cable size on both sides of the lower compartment of the box for cable entry	As per RFP
115	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,3 (viii)	Similarly, 4 Nos. holes with superior quality rubber cable glands shall be provided in the Partition sheet of upper & lower compartments of the cubicle for entry of secondary wires of CTs. Internal diameter for gland used in partition sheet shall be 15mm.Glands shall be made such that internal diameter of glands provided for cables should be closed with the film of minimum 1mm thickness. Cable will go through the cable glands by piercing the film of the glands. Cable glands shall be fixed with suitable adhesive so that the same does not get removed.	Due to Both doors are sealed, Can we provide Partition plate with Wire CUT instead of 4nos Gland	As per RFP

116	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,4 (v)	Secondary terminal shall be of brass stud type. The size shall be minimum 6.0 mm dia 20 mm outside length with spring washer and double nuts.	We confirm that a brass secondary insert of M5 size ng with the screw will be provided.	As per RFP
117	MD/WZ/06/PUR/TS- 1942	SMC Box LTCT Meter,4 (x)	The ratio shall be engraved on the body of C.T. In addition, name plate of anodized aluminium indicating the necessary details, year of manufacture etc. engraved on it shall be provided in such a manner that the information is clearly visible after mounting.	We confirm that a suitable sticker containing all necessary information will be provided.	Shall also be accepted
118	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Supply quality measurement & Total Harmonic Distortion (in % of fundamental)	Meter shall have capability to log at least 20 nos. following quality of supply monitoring events with date & time:- (i)Phase wise voltage sag(Voltage range &time defined by Discom) (ii)Phase wise voltage swell(Voltage range and time defined by Discom)	Below Parameters are :- Phase wise voltage sag(Voltage range &time defined by Discom) Phase wise voltage swell(Voltage range and time defined by Discom) Kindly remove these parameters its beyond IS-16444.	Shall be accepted ,PQ events may not be used in energy meters
119	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Mid Night Energy	Active Import Total (Q1+Q4) • Active Export Total (Q2+Q3) • Reactive Import while Active Import – Q1 • Reactive Import while Active Export – Q2 • Reactive Export while Active Export – Q3 • Reactive Export while Active Import – Q4 • Apparent – While Active Import • Apparent – While Active Export • Active forwarded • Reactive lag-lead registers • Apparent forwarded.....	Kindly accept:- Meter shall be capable to daily snapshot at 00:00 hrs. for last 60 days with following cumulative energy parameters: • Active Import Total (Q1+Q4) • Active Export Total (Q2+Q3) • Reactive Import while Active Import – Q1 • Reactive Import while Active Export – Q2 • Reactive Export while Active Export – Q3 • Reactive Export while Active Import – Q4 • Apparent – While Active Import • Apparent – While Active Export	• Active Import Total (Q1+Q4) • Active Export Total (Q2+Q3) Active Import Fundamental (Q1+Q4) • Active Export Fundamental (Q2+Q3) • Reactive Import while Active Import – Q1 • Reactive Import while Active Export – Q2 • Reactive Export while Active Export – Q3 • Reactive Export while Active Import – Q4 • Apparent – While Active Import • Apparent – While Active Export • Net KWH
120	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),MD registration	Maximum Demand Computation will be based on Sliding Window concept with integration period as default of 15 minutes(DIP) with 5 minutes sub integration period. Meter should be configurable for recording of MD with integration period of 5 minutes and 30 minutes with 1 minutes and 10 minutes sub integration period. The MD integration cycle shall be on the basis of real time	We will provide MD integration period default 30 minutes with 10 minutes sub integration period and for 15 minutes sub integration period 5 min.	As per RFP
121	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Terminal Block Cover	The terminals block cover for the energy meters shall be extended transparent type, ETBC shall have a hinge arrangement for easy access of terminal for wire termination.	The terminals block cover will be opaque, The terminals block cover is flush type and detachable. Kindly accept.	As per RFP
122	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Meter case	The meter shall have transparent/opaque cover and opaque base. In case of opaque meter cover, there shall be provision of transparent window to see the display of meter. Meter cover and case shall be ultrasonic welded / encapsulated design with chemical welding with break to open design.	Meter Top and T-Cover: Transparent. Base and module Cover Grey. Meter is chemically welded, break top open type construction.	As per RFP

123	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smar Meter -/5A 0.5S and 0.2S),D.4 Technica requirement & design criterion	Meters shall be designed on 3 phase 4 wire measurement principle & should have 3 current & 3 voltage measuring circuit i.e. one for each Phase	Just to confirm, we will be supplying a 3P-4wire meter. It's also od to note that this meter can be configured for 3P-3W usage through a simple connection adjustment	As per RFP
124	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Basic system parameters for which these meters will be used	M) Meter shall operate and record satisfactorily independent of phase sequence of input supply and phase association between voltage and	Just to clarify, in the event of phase association tamper, our standard procedure is to provide only logging data and the meter run information, based on the existing electrical conditions at that time.	Phase association tamper shall be logged along with date and time and restored after normalised the conditions . Meter shall be work in accuracy in reverse phase sequence condition and record the condition in meter
125	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Load Survey Capability	It should be possible to store previous data of at least 45 days i.e. load survey is needed for the demand and all energy consumed. shall be selectable for the following parameters: i) Real time clock date and time ii) KWH (Import & Export) iii)KVAH (Import & Export) iv)RKVAH Lag (Import & Export) v)RKVAH Lead (Import & Export) vi) Net KWH Energy (Configurable) vii) Phase wise Voltages viii) Phase wise currents In addition of above the following Additional parameters shall be provided in load survey: ix) PF (Import) & PF (Export) both x) Demand (Active, Reactive, Apparent) xi) % THD in R, Y, B Phase Voltage xii)% THD in R, Y, B phase Current xiii) Net KVArh A) The choice of selecting any parameters indicated above shall be user selectable. B) All the load survey data should be available in numerical as well as graphical format. It should also be possible to view this data in daily, weekly and monthly formats. The load survey graph should show values. C) It should be possible to retrieve load survey data by hand held meter reading device through communication port provided on the energy meter	You are requested to please accept load survey data as per IS-15959 with latest amendment.	As per TS , THD % shall be deleted
126	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Profile capture period	By defaults 15 minutes and programmable for 5 & 30 minutes, SIP (Survey integration period)should be same of DIP(Demand integration Period)	We will provide Profile capture period 30 minutes and 15 min.	As per RFP
127	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Manufacturer's Seals	**ADDITIONAL SEALS:** The bidder shall be required to supply 5nos.lash wire polycarbonate seals free of cost with each meter, The bidders are required to submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals with the sample meters for evaluation by the committee as per technical specifications given in Annexure-E.	We understand that 5 nos lash wire polycarbonate seals are required with each meter to be supplied and 5 nos similar (lash wired numbered) seal samples in Need more clarity, And Is this requirement applicable for HT CT meter only?	5 nos lash wire polycarbonate seals are required with each meter to be supplied and meter body seal separately supply, for other meters as per RFP
128	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Hand Held Unit (HHU)/CMRI	The HHU shall be as per IS 15959(Part3) with latest amendment for data exchange and it shall be compatible to the DLMS compliant energy meters that are to be supplied on the basis of the specification having at least one USB communication Port.	We will provide mobile app instead of CMRI. Please accept.	Mobile app for HT smart meter may not be accepted

129	MD/WZ/06/PUR/TS- 1942	Annexure D_HT Consumer Meter specification (Three Phase HTCT Smart Meter -/5A 0.5S and 0.2S),Annexure-E 4. seal	Every seal should have 20 cm long non corrosive, nonmagnetic two strand stainless steel wire (0.40/0.25mm) permanently moulded to the seal body and locking cap of seal also moulded with steel wire.	·ification: .ı wire diameter is 0.9±0.1	As per RFP
130	TS- 1942	For 20-100A Page No. 28 Clause no. 12.1 Whereas Page No. 2 GTP Sr.No. 17©	Colour of Meter: Grey/Opaque base & Transparent/Opaque Top cover & Translucent/transparent/Opaque Module cover and Transparent Terminal cover with wire entry Cut. Meter Cover Material- As above Transparent Polycarbonate	Complied technical specification page no. 14 clause no. 12.1(Meter Case).	As per RFP
131	TS- 1942	Section-3, Clause-29.3, Page No. 58 of 407	Within 14 (fourteen) Days of the receipt of Letter of Award from Utility, the Successful Bidder shall furnish the Performance Security, using for that purpose the format of Performance Security given in Form 1 in Section 8.	Please provide the percentage of performance security	Performance security as per Clause 4.1 & 4.2 of GCC and 6.1 & 6.2 of SCC.
132	TS- 1942	Three phase 20-100A Page 1,17 of 36 /Clause 4 Supply system	Current - Ib = 20/10 Amp Imax =100 Amp or higher	Kindly clear the requirement of current rating of the meter. On heading of the technical specification, it was mentioned 20-100A or 10-100Abut in this point 20/10A and Imax 100A is written. We can provide 20-100A. Kindly we request you to provide the acceptance for the same.	3-Ph meter will be 10-100 A or 20-100 A.
133	TS- 1942	Three phase 20-100A Page 21 of 36 /Clause 5.12.2	Provision shall be made for programmable time between the two maximum demand reset operations.	We will provide 15 Min time between two MD reset. Kindly we request you to provide the acceptability for the same.	Reset time should be less that 5 min
134	TS- 1942	Three phase 20-100A Page 21 of 36 /Clause 5.12.4	Display cycles shall be repeated after 15 minutes.	Auto cycle repeat immediately after completion of auto mode parameters. Kindly we request you to provide the acceptability for the same.	Auto repeat is okay,
135	TS- 1942	Three phase 20-100A Page 81 of 137 /Clause 9.1	The location of lithium battery shall be such that it should be possible to replace the battery at site.	Battery is the internal part of the meter and it should not replaceable at site. Kindly we request you to provide the acceptability for the same.	Non-replaceable battery of meter at site.
136	TS- 1942	Single Phase 5-30A, page 21 of 43, Clause 37.13, Three phase 20-100A/10-100A, Page 18 of 36 Clause 5.3.1 Three phase LTCT -/5A: Page 4 of 36 /Clause 5.1	The meter shall be full programmable by the user for TOD timings and billing dates etc. For security reasons, the meter operating software should have at least "two level write protection" against any modification/editing of the parameters, data, setting etc. except those required for Billing data, TOD metering & meter shall be as per IS15959 part 2 The meter shall be full programmable by the user for TOD timings and billing dates etc. For security reasons, the meter operating software should have at least "two level write protection" against any modification/editing of the parameters, data, setting etc. except those required for Billing data, TOD metering & meter shall be as per IS15959 part 3	We will provide Security feature as per IS 15959. Kindly we request you to provide acceptance for the same.	As per RFP
137	TS- 1942	Three phase 20-100A/10-100A, Page 21 of 36, Clause 5.11, Tamper Features Neutral Missing Three phase LTCT -/5A: Page 11 of 36 /Clause 15, Performance of Dc injection	When DC is injected in neutral circuit and the meter voltage increases above 300 V, Meter will do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. Recording and indication of tamper must occur under this condition.	Kindly clear that relay disconnect only in case of any suspicious signal on neutral i.e. during ND tamper. This is not applicable for LTCT meter.	As per RFP
138	TS- 1942	Three phase 20-100A/10-100A, Page 21 of 36, clause 5.12.4 Three phase LTCT -/5A: Page 9 of 36 /Clause 12.4	Meters shall be programmed for auto display of billing parameters with provision of :- - 15 seconds time display of each billing parameters auto scroll.	Kindly we request you to accept all parameter timings 15 second in Auto mode	As per RFP

139	TS- 1942	Three phase 20-100A: Page 2 of 36 /Point 13	Communication port should be as per IS 16444. AMR through optical port/ GPRS is acceptable.	We will provide Local communication with Optical and over the through WAN/NAN. Kindly we request you to provide the acceptance for the same.	As per RFP
140	TS- 1942	Three phase 20-100A: Page 4 of 36 /Clause 23 iii,	iii) Load is not terminated back to meter & current is drawn through local earth fully or partially	This is not applicable for three phase meter. Kindly we request you to provide the acceptance for the same.	As per RFP
141	TS- 1942	Three phase LTCT -/5A: Page 11 of 36 /Clause 14 Magnetic influence	When AC voltage chopped in neutral circuit and the meter voltage increases above 300 V, Meter will do deficiency metering (i.e. Vref x 1 x UPF) and accuracy will be within +3% as per Indian Standard. Recording and indication of tamper(ND) must occur under this condition.	Not applicable for LTCT meter.	As per RFP
142	TS- 1942	Three phase LTCT -/5A: Page 3 of 36 /Clause 4.5.2 Running with no load	The meter shall be designed for 5A CT secondary with 200% overloading. The meter operating software should be programmable so as to enable direct reading of energy and other quantities on the metered (Primary) circuit for any CT ratio specified with application of any multiplying factors. However it should be as per IS 15959.	We will provide Factory programmable CT Ratio. Kindly we request you to provide the acceptance for the same.	As per RFP
143	TS- 1942	Three phase LTCT -/5A: Page 8 of 36 /Clause 8.2 (ii) Manual Billing	The left – hand button on the front of the meter shall be capable of being configured for use as a maximum demand reset button by selecting the appropriate option in the tariff configuration file.	We will provide manufacture specific button with proper marking. Kindly we request you to provide the acceptance for the same.	Shall also be accepted as per design of meter
144	TS- 1942	Three phase LTCT -/5A: Page 9 of 36 /Clause12 Neutral Missing(h)	The meters shall work properly even if neutral is not available	Neutral Missing tamper is not applicable for three phase meter. Kindly delete this requirement.	As per RFP
145	TS- 1942	Three phase LTCT -/5A: Page 24 of 36 /GTP Point 19	v)Without neutral and in absence of any two phases or even with earth	Neutral Missing tamper is not applicable for three phase meter. Kindly delete this requirement.	As per RFP
146	TS- 1942	Three phase LTCT -/5A: Page 24 of 36 /GTP Point 19	(c) Load is not terminated back and current is drawn through local path	This condition is no applicable for Three phase meter. Kindly delete this requirement.	As per RFP
147	TS- 1942	Three phase HT -/5A: Display Parameters: Annexure F Page 38,41 of 41	Apparent Power (import and export) KVA Signed Active Power (import and export) KW Signed Reactive Power (import and export) KVAR	We will provide Security feature as per IS 15959 Active power, Apparent power and Reactive power will provide as per IS 14697. We can calculate energy import and export and unable to Calculate import and export power . kindly accept the same	As per RFP
148	TS- 1942	Three phase HT -/5A: A.Tamper Detection Features: Page 32 of 41, C6 Point 5	Current Reversal: Reversal of CT	We will not Provide reverse tamper during bi-directional Mode if one, two and three phase Reversal.	As per RFP
149	TS- 1942	Three phase HT -/5A: D4 Load survey capability Page 13 of 41	KWH(KWh import -KWh export) - Demand(Active, Reactive, Apparent) PF (Import) & PF (Export) both	We will provide Net Kwh and Demand KW, KVA, KVAr-lag, KVAr-Lead , PF in derived parameter at BCS end , Kindly accept the same.	As per RFP
150	TS- 1942	Three phase HT -/5A: D4 Load survey capability, point L Page 12 of 41	Meters shall be four Quadrant meter capable of recording active reactive and apparent energy and also demand in four quadrants.	Reactive Demand is not defined in IS 15959 part 3 so Kindly delete the requirement.	As per RFP
151	TS- 1942	1P 5-30A SMART METER Page No.15 Clause No. 26.4 Whereas Page No. 20 Clause No. 37.4	The terminals shall be of suitable rating to carry 200% of Imax and shall be made of electro-plated (or tinned) brass. Meter shall work within accuracy up to max. loading up to 120%Imax.	Complied 120% Imax shall be applicable for both meters & terminals. Kindly confirm the same.	As per RFP
152	TS- 1942	1P 5-30A SMART METER Page No.29 Schedule IV(B) Point No.9 And also in GTP page No.35 Point No.15	The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad can be accepted. Spring loaded push button to be provided on top cover of meter box to activate the push button of meter to read parameters Spring loaded push button/ Capacitive Touch Keypad can be accepted.	Complied with suitable push button with spring action which shall be provided on meter cover and top cover of meter box to activate the push button of meter to read parameters. Kindly confirm the same.	As per RFP

153	TS- 1942	1P 5-30A SMART METER Page No.25 Schedule IV(B) Point No.10	Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.	We will provide serial number of meter is to be graved/marked on the cover of the Meter box only. kindly confirm the same.	Shall also be accepted as per design of meter
154	TS- 1942	1P 5-30A SMART METER And also in GTP page No.35 Point No.10 (Note)	Meter Cover should be ultrasonically welded. The meter shall be encapsulated/ chemical welding with break to open type designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design	We will provide chemical welding cover with base. Kindly confirm the acceptability of the same.	As per RFP
155	TS- 1942	3P 20-100A SMART METER WITH BOX Page No.28 Clause No. 13 "Sealing of the Meter"	The meter cover shall be ultrasonically welded/ chemically welded in case of encapsulated design with the base so that the cover could not be opened without breaking Proper sealing arrangements shall be provided on the meter to make it tamper proof and avoid mishandling by unauthorized person.	We will provide chemical welding cover with base. Kindly confirm the acceptability of the same.	As per RFP
156	TS- 1942	3P 20-100A SMART METER WITH BOX Page no. 33 "Technical specification of hinge type meter box made of Engineering Plastic (Polycarbonate) clause no.10	The boxes shall be specific to the meter mounted in it. Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.	We will provide serial number of meter is to be engraved/marked on the cover of the Meter box only. kindly confirm the same.	As per RFP
157	TS- 1942	3P 20-100A SMART METER WITH BOX Page no. 33 "Technical specification of hinge type meter box made of Engineering Plastic (Polycarbonate), clause no.9	The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad is acceptable.	Complied with suitable push button with spring action which shall be provided on meter cover and top cover of meter box to activate the push button of meter to read parameters. Kindly confirm the same.	Shall also be accepted as per design of meter
158	TS- 1942	3P 20-100A SMART METER WITH BOX Annexure B Page No.3 GTP Sr. No. 22 Type of hinged undetachable terminal cover & size/ thickness of hinges	Book (Door) type opening	We will provide terminal cover with top to bottom side hinge provision. kindly confirm acceptability the same.	Shall also be accepted as per design of meter
159	TS- 1942	3P SMART LTCT & SMC BOX Page No.15 Clause No. 22 "Sealing of the Meter"	The meter shall be encapsulated designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design.	We will provide ultrasonic/chemical welding cover with base. Kindly confirm the acceptability of the same.	Control cable is in the scope AMISP (if required)
160	TS- 1942	3P SMART LTCT & SMC BOX Page No.31 clause no. 1.3 Page No.32 clause no. 3 (iv)	The upper compartment is meant for housing 1 No. Static Three phase four wire meter, modem and antenna, if required, and the lower compartment are for housing 4 Nos. Current Transformers (CTs.). The top compartment of the box should be used for the three phase four wire energy meter, modem and antenna.	The Smart meter communication through Cellular based / RF based plug in module (NIC Card) therefore there shall be no need of modem. Hence, kindly we request you to delete the requirement of the provision for housing of modem and antenna. Kindly confirm.	The top compartment of the box should be used for the three phase four wire energy meter, with requisite module for communication.
161	TS- 1942	3P SMART LTCT & SMC BOX Page No.31 clause no. 1.2	It should also conform as per the technical requirements, as per indicative drawing; Indicative drawing shall be provided by the agency for approval.	The specification received is without the drawing. Therefore we request you please provide the drawing so that we can better understand what type of arrangement is required by you in the meter box. Please confirm.	As per RFP

162	TS- 1942	3P SMART LTCT & SMC BOX Cubical SMC Box Page No. 34, Clause no. 3 (ix) "Printing"	Metallic label containing the letters "Name of Discom" and the purchase order and date shall be engraved in the top cover of the Box. The name of the manufacturer shall be engraved on the bottom of half of the box. A blank sticker shall also be fixed on the meter box for use of field staff to indicate the service No., Meter constant, CT ratio etc	We shall provide all the details printed on metallic name plate by riveted on the meter box cover. Kindly confirm the acceptability of the same.	Shall also be accepted
163	TS- 1942	Clause No.8.1, QR, Technical Requirement, Page No. 19 of 407	(a) paid for, or received payments for, construction of Eligible Project(s); or (b) paid for development of Eligible project(s) in the Infrastructure sector in the last 7 (seven) Financial Years with aggregate project value of not less than INR [50% of the Estimated Project Cost]	Kindly Amend this "(a) paid for, or received payments for, construction of Eligible Project(s); or (b) paid for development of Eligible project(s) in the Infrastructure sector in the last 7 (seven) Financial Years with aggregate project value of not less than INR 260Crores.	As per RFP
164	TS- 1942	Project Implementation Schedule, Clause No. 2, Page No.-268 of 407	Approval of detailed Project Implementation Plan by Utility Within 15 days from the date of submission of Project Implementation Plan.	Kindly Amend this "Approval of detailed Project Implementation Plan by Utility Within 2 months from the date of submission of Project Implementation Plan.	As per RFP
165	TS- 1942	Section-A, BOM, Page No. 146 of 407, Control Cables, Clause No. 1.3, 1.4	Control Cables	Supply of control cable is Utility scope or Bidder scope. Kindly confirm.	Control cable is in the scope AMISP (if required)
166	TS- 1942	Auxiliary Item	Auxiliary Item Scope	Who will provide auxiliary items, Utility or Bidder?? Please confirm	AMISP have to arrange all auxiliary items required for completion of work.
167	TS- 1942	Section-2; QR Clause no. 8.3-(a); Page No. 27 of 407	Eligible Projects, as referred in Technical Requirement, shall mean works contracts for developing asset/ facility in India or abroad which involve building/ installing, and commissioning/ go-live such asset/ facility but shall not include any assignment where the scope is limited to only (i) supply of goods or (ii) supply of manpower.	Kindly Amend this "Eligible Projects, as referred in Technical Requirement, shall mean works contracts for developing asset/ facility in India or abroad which involve building/ installing, and commissioning/ go-live such asset/ supply of goods"	As per RFP
168	TS- 1942	Section-6, Clause-7.7, Page No. 230 of 407	The Total Penalties under SLA Categories are capped at 20% of AMISP Service Charge.	Kindly Amend This "The Total Penalties under SLA Categories are capped at **5%** of AMISP Service Charge".	As per RFP
169	TS- 1942	Section -7; GCC, Clause No. 5.3, Page No. 359 of 407, Liquidated Damages,	Utility shall without prejudice to all its other remedies under the contract, deduct from the amount due to be paid, as liquidated damages, 50% of AMISP Service Charge for each delayed meter for each completed month of delay for a maximum period of 12 (six) months	Kindly amend this "Utility shall without prejudice to all its other remedies under the contract, deduct from the amount due to be paid, as liquidated damages, **5%** of AMISP Service Charge for each delayed meter for each completed month of delay for a maximum period of 12 (twelve) months"	As per RFP
170	TS- 1942	Section-6, Clause-2.6, Page No. 189 of 407	NOMC Area	Please provide buildup area detail for NOMC	To be informed to successful bidder after placement of LOA
171	TS- 1942	Section-6, Clause-2.6.2, Page No. 190 of 407	No. of NOMC a) Six numbers Operator workstations including one for Supervisor	6 Nos of NOMC is required for this project? Please confirm	Only 1 no of NOMC shall be required for the project
172	TS- 1942	Section 6 : Project Requirement – Clause 1.15, Page No. 155 of 407	"Each team should comprise of at least one technician along with a supervisor".	Each team would comprise of 1 technician and 1 helper. Please confirm.	As per RFP
173	TS- 1942	Section 6 : Project Requirement – Clause 1.16, 155 of 407	" All the necessary Civil work, due to dismantling the existing structure and to place new, shall be carried by the AMISP in a professional way".	Any Civil work will not be under the scope of AMISP. Please confirm.	All necessary work will be in scope of AMISP
174	TS- 1942	Section 6 : Selection of DC-DR – Clause 2.7.3.3.4, 197 of 407	DC-DR	Please confirm the requirement of DC – DR set up physical or Cloud basis set up. Also same is under Bidder scope or MPPKVVCL scope.	As per RFP

175	TS- 1942	Section 6 : Selection of DC-DR – Clause 2.7.3.3.4, 197 of 407	DC-DR	Scope of supply and hosting, configuration of hardware infra for –DR is under Bidder scope or MPPKVVCL scope	Under AMISP's scope
176	TS- 1942	3 Phase, 20-100A or 10-100A, Page No. 31 of 36 of Technical specification, Meter Reading Instrument, Clause No.26	With each lot of 1000 meters, the bidders are required to supply one number Common MRI (Meter Reading Instrument) free of cost. MRIs should conform to technical specification given in Section III- C & minimum Guaranteed Technical Particulars given in Schedule-II-B of this tender specification. 1 Android (Android versiön 12 or latest) based CMRI for 20,000 meters shall be provided by AMISP (it will be handed over to Discom along with the Set of Meters).	1 No CMRI has to supply for every 1000 Nos of smart meters or 20,000 Nos of smart meters. Please confirm.	Both CMRI and Mobile app are acceptable
177	TS- 1942	Hand Held Unit (CMRI) 3 Phase, HTCT Smart Meter, Page No. 22 of 41	15 no CMRI should be supply free of cost.	1 No CMRI or 15 Nos CMRI has to supply at free of cost	15 nos CMRI for MT divisions
178	TS- 1942	3 Phase Smart Meter	Sample meters for Demonstration	Can we submit sample meters 10-60A or 20-100A during demonstration. Please confirm.	As per RFP
179	TS- 1942	3 Phase LTCT / LTDT Smart Meter	Sample meters for Demonstration	Can we submit sample meters 3 phase LTCT consumer meter or 3 Phase LTDT meter during demonstration. Please confirm.	As per RFP
180	TS- 1942	3 Phase CT/PT operated Smart Meter	Guaranteed Technical Particulars	We request you to provide the format for Guaranteed Technical Particulars for CT/PT operated smart meter.	Shall be provided
181	TS- 1942	3 Phase CT/PT operated Smart Meter, Page No. 2 of 41	Accuracy Class: Class 0.5S or 0.2S as per IS 16444: Part 2 (As applicable)	We request you confirm the class of accuracy of the meter is 0.5S or 0.2S. please confirm.	0.5s for HT consumer and 0.2s for EHV consumer as per requirements
182	TS- 1942	3 Phase CT/PT operated Smart Meter, Page No. 2 of 41	Current rating: 5A / 1A Class 0.5S or 0.2S as per IS 16444: Part 2 (As applicable)	We request you confirm the current rating of the meter is 5A or 1A. please confirm.	5A for HT consumer and 1A for EHV consumer as per requirements
183	MD/WZ/06/PUR/TS-1942	Section 2. Eligibility Requirements Clause-8. Qualification Requirements 8.1 Technical Requirement Sub-clause-1	Sole/ Lead Bidder must have either: (a) paid for, or received payments for, construction of Eligible Project(s); Or (b) paid for development of Eligible project(s) in the Infrastructure sector in the last 7 (seven) Financial Years with	We understand that the "last seven (7) financial years" shall be considered up to and including FY 2023–24, and request your kind confirmation.	As per RFP
184	MD/WZ/06/PUR/TS-1942	Section 2. Eligibility Requirements Clause 8. Qualification Requirements 8.1 Technical Requirement Sub-clause-1	Sole/ Lead Bidder/ any other Consortium Member must have experience of integration of head-end system with MDM on standard interfaces and data exchange models for at least [50% of RFP] consumers / end points (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last 7 (seven) years which are in operation for at least 1 (one) year.	We understand that experience gained as a Subcontractor or OEM shall be considered, provided such entity participates as a Lead Bidder or Consortium Member in this bid, and request your kind confirmation.	As per RFP

185	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 7.7 Service Level Agreement (SLA) Sub Clause-6	Installation/Replacement of Smart meters in terms of replacement Burnt meter case/ Provide new service connection: AMISP will ensure to replace/install the new smart meter against the defective Smart meter / new service connection within the awarded area. The timeframe for installation/ replacement of Smart meters shall be as follows: Service Level Timelines Meter installation for New Service Connection -4 Days Replacement of Burnt Meter (post intimation by Utility representative)- 3 Days Replacement of Defective Meter (post intimation by Utility representative)- 3 Days	In view of the predominantly rural and geographically dispersed ,ect area, we request that the timeline for meter installation/replacement activities be revised to a minimum of 7 days for practical and efficient execution.	As per RFP
186	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements Annexure M Clause-18	In case a bidder is participating in more than one Lot in a particular Discom with the same consortium/JV partners and the same OEM mix, and intends to demonstrate the same technology/platform for both the lots in a particular Discom, then only a single common demonstration shall be conducted and will be considered valid for both the Lots. The bidder shall, however, be required to submit the required form separately with each Lot at the time of bid submission	We understand that in case a bidder participates in multiple lots within the same Discom with identical consortium/JV partners and OEM composition, a single demonstration shall be applicable for all such lots. Further, we understand that if a bidder qualifies the demonstration in one lot, the same may be considered valid for participation in other lots; however, in case the bidder is not successful in one lot, they may be provided an opportunity to qualify in another lot. We request your kind confirmation on the same.	In case a bidder is participating in more than one Lot in a particular Discom with the same consortium/JV partners and the same OEM mix, and intends to demonstrate the same technology/platform for both the lots in a particular Discom, then only a single common demonstration shall be conducted and will be considered valid for both the Lots either pass or fail and no further opportunity will be provided for demontration and qualification in another Lot. The bidder shall, however, be required to submit the required form separately with each Lot at the time of bid submission
187	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements 2.3 Head End System (HES) Sub Clause-i	Store raw data for defined duration (minimum 45 days). HES shall hold the data before it is transferred to the MDM. However, Billing Data of smart Meter shall be permanently available up to contract period at HES Level	Since both HES and MDMS are within the scope of AMISP and billing data is already maintained at the MDMS level for the contract duration, retaining billing data at the HES level may impact project competitiveness. We therefore request reconsideration and relaxation of this requirement	As per RFP
188	MD/WZ/06/PUR/TS-1942	Section 6. Project Requirements	Further, any directive or amendment issued by the MoP/REC/PFC and other Government bodies till date shall also been applicable to this AMISP tender.	We understand that any directives or amendments issued (or to be issued in future) by MoP/REC/PFC or other Government authorities, particularly related to SBD provisions such as reporting, payments, performance guarantees, and implementation timelines etc , shall be deemed applicable to this tender. Kindly confirm	Yes, applicable

189	MD/WZ/06/PUR/TS-1942	Technical specification of meters Clause 34	The bidder shall be required to supply 5 nos. lash wire polycarbonate seals free of cost with each Single-phase meters, as per specification appended herewith in Annexure-IV (C). The series of seal numbers shall be provided by the [UTILITY] in the event of placement of order. The bidders are required to submit 5 (Five) Numbers samples of Poly Carbonate Numbered seals with the sample meters (Seals shall be provided at the time of technical demonstration and not at the time of bid submission. The final seal design and specification shall be changed/updated after issuance of the LoA, as per Discom's approval.) for evaluation by the committee as per technical specifications given in Annexure-IV (C).	We request relaxation of the requirement to submit ycarbonate seals during the technical demonstration stage, as the demonstration is primarily intended to evaluate system interoperability. Further, as per REC Letter No. REC/RDSS/2022-23/317 dated 07.11.2023, the requirement for submission of seals has been withdrawn. A copy of the letter is attached for your reference and consideration.	As per RFP
190	MD/WZ/06/PUR/TS-1942	Tender Details: Work Item Details	Tender no.: MD/WZ/06/PUR/NIT-328/TS-1941: Tender Value: Rs. 11,98,54,00,000	Considering the present price trend for AMISP contracts, kindly increase the Estimated Tender value by 35% from the present value.	As per RFP
191	MD/WZ/06/PUR/TS-1942	BOQ	General	We understand that service cable, power cable are not covered in the scope of this tender.	Existing service cable & meter board shall be utilized by the AMISP for installation of Meters and in case of damaged service cable/Board or new connections, the service cable/ meter board shall be provided and installed by the Utility/consumer if required as per assessment of the discom. Other items such as Lugs & Fasteners etc. need to be arranged by the AMISP
192	MD/WZ/06/PUR/TS-1942	31. [Advance Payment security (Optional)]	31. [Advance Payment security (Optional)] 30.1 [Utility, at its discretion, may provide to the successful bidder an interest-bearing advance payment against an advance payment security furnished by the successful bidder in the form of a bank guarantee for [15] % of the Contract Price. 30.2 Within 14 (fourteen) Days of the receipt of Letter of Award from the Utility, the Successful Bidder shall furnish the Advance Payment Security, using for that purpose the format of Advance payment Security given in Form 4 in Section 8. 30.3 The utility shall provide an advance payment for [70] % of the advance payment security furnished by the successful bidder, at the time of contract signing. 30.4 The amount of the security shall be reduced in proportion to the value of the services executed by and paid to the successful bidder from time to time and shall automatically become null and void when the full amount of the advance payment has been recovered by the Utility. The security shall be returned to the successful bidder immediately after its expiration 30.5 The interest rate on advance payment shall be Marginal Cost of Funds Based Lending Rate (MCLR) for one year of the State Bank of India, prevailing on the date of advance payment to the Successful Bidder. The interest accrued on interest bearing advance shall be adjusted first before releasing any payment. The interest rate shall be calculated on the daily progressive balances outstanding as on the date of recovery/adjustment i.e., on daily rest basis.]	The Advance Payment security clause is deleted in the RFP. Requesting you to please incorporate the clause.	As per RFP

193	MD/WZ/06/PUR/TS-1942	1.4 Brief Scope of Work:	i. In case of three phase Whole current meter as mentioned in price bid, AIMSP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).	For three phase whole current meter, Kindly accept 10-100A ter for 100% quantity.	both 10-100 A or 20-100 A are acceptable
194	MD/WZ/06/PUR/TS-1942	1.4 Brief Scope of Work:	Further the Existing service cable & meter board shall be utilized by the AMISP for installation of Meters and in case of damaged service cable/Board or new connections, the service cable/ meter board shall be provided and installed by the Utility/consumer if required as per assessment of the Discom. Other items such as Lugs & Fasteners etc. need to be arranged by the AMISP	Lugs fixing not in scope of AMISP.	As per RFP
195	MD/WZ/06/PUR/TS-1942	2.2.1 General Requirements	AMISP should provide Bluetooth enabled device externally on optical port along with mobile app for seamless data transmission (without manual intervention) from Meter to HES.	For Single Phase and Three phase WC meter we are offering BLE communication so that meters can be read through BLE communication without connecting with optical port. For LTCT and HT meters we are offering mobile app with optical communication for local reading. Kindly accept the same.	As per RFP
196	MD/WZ/06/PUR/TS-1942	9.1 Responsibility of Tests and Inspection	The Smart meter (WAN /NAN) should be type tested at any NABL accredited Laboratory in accordance with IS 16444 with latest amendments and our tender specifications, CBIP Report 325 and IS15959 with latest amendments.	The threshold limits and testing method specified in IS16444 and CBIP325 is same. Requesting you to please accept type test report with IS 16444 and IS 15959 only.	As per RFP
197	MD/WZ/06/PUR/TS-1942	Annexure F	Annexure F General requirement for common pluggable communication module for Smart Meters	Design & pin configuration specified in Annexure E of the tender is very design specific requirement and it is not yet standardized. We recommend the Utility shall focus on end to end data delivery as per SLA and asset shall comply with relevant standard.	As per RFP
198	MD/WZ/06/PUR/TS-1942	Annexure L	Annexure M Guidelines for Technical demonstration for evaluation by Discom	We understand that demonstration of interoperability will be performed for technical evaluation of tender only. In future HES shall be communicated with our specific meter make only. Please confirm.	Only DISCOM-approved meters shall be installed, and interoperability shall be demonstrated with meters from three different manufacturers.
199	MD/WZ/06/PUR/TS-1942	Annexure N	Annexure N Specifications of CT for LT-CT meters 1.1.1. TYPE TESTS: Copies of all type tests as per IS.2705 Part-I and II including short time current & temperature rise tests in NABL accredited laboratory shall be submitted and got approved before commencement of supply.	IS2705 is withdrawal/ obsolete and new IS16227 is incorporated. Kindly accept type test with IS16227.	Shall also be accepted
200	MD/WZ/06/PUR/TS-1942	Annex-A	Annex-A Technical specification Consumer metering 1.SCOPE:- a. This specification covers design, engineering, manufacture, stage-inspection, testing and supply of A.C. Single Phase (1 Ø) Whole Current Smart Meter with NIC card (Rating: 5-30 A) with starting & Limits of Error test as per 5A Ib) solid state (static) whole current electronic LT energy meters of accuracy class1.0 with backlit LCD display and communication port for data downloading as per requirement given in this specification.	Kindly accept meter with 5-60A current rating.	5-30A or 5-60 A Meter rating is accepted

201	MD/WZ/06/PUR/TS-1942	Annex-A	1.SCOPE:- The single phase meter should register energy as per accuracy class even if the incoming phase and neutral terminal of the meter are connected together & only phase is drawn from the supply and load is connected on both phase and neutral or either of the two element of the meter separately and is being run through earth. The meter should record energy as per actual current drawn. 35.2 Load Earthing: (i) The meter shall record correctly when earth is used as a return path for load fully or partially even when phase and neutral connection are reversed 35.3 Neutral Missing/Disturbance: (a) In the event of disconnection of neutral from incoming & outgoing side – 53. Tamper circuits	To prevent such tamper condition meter will disconnect the wer supply through switch. Meter will power of only by connection of both phase and neutral. Single wire metering is not available. Kindly accept the same.	As per RFP
202	MD/WZ/06/PUR/TS-1942	Annex-A	15.3 Meter Reading during Power Outage: The meter shall have provision to read the meter in no-power condition.	All smart meters are connected with HES and read on daily basis. We are not promoting manual meter reading of smart meters. However meter does not have provision for reading on no power condition.	As per RFP
203	MD/WZ/06/PUR/TS-1942	Annex-A	16.1 COMMUNICATION CAPABILITY Meter Box cover shall be provided with a suitable arrangement (slot) to read the meter Electronically though CMRI by using Optical Cable/Port Directly.	Meter have BLE communication and can be read without physical connection. Meter box does not have any arrangement (slot) to read the meter Electronically though CMRI by using Optical Cable/Port Directly.	As per RFP
204	MD/WZ/06/PUR/TS-1942	Annex-A	d. Common Meter Reading Instrument (CMRI) to be supported for all category single phase and phase meters	Kindly accept mobile app instead of CMRI for local communication.	Both CMRI/Mobile app is acceptable
205	MD/WZ/06/PUR/TS-1942	Schedule-IV(B)	TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate) 2. The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 degrees. Centigrade.	The meter box should be unbreakable un-deformable and should withstand the temperature up to 130±10 degrees centigrade. Kindly accept the same.	As per RFP
206	MD/WZ/06/PUR/TS-1942	Schedule-IV(B)	5. The top cover of the meter box should be of Hinge type having at least 2 nos. U clamps to hold the cover with base with tamper proof sealing arrangement.	Meter box have snap fit arrangement with sealing provision made of PC material. Kindly accept the same.	As per RFP, however It is also acceptable
207	MD/WZ/06/PUR/TS-1942	Schedule-IV(B)	6. Further bidder may also provide General practice Book open type arrangement therefore internal hinges should provide accordingly	Meter box cover will open from left to right arrangement. (reverse of open book type)	As per RFP, however It is also acceptable
208	MD/WZ/06/PUR/TS-1942	Schedule-IV(B)	9. The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad can be accepted.	Meter box have separate window to access Capacitive Touch Keypad of meter. Kindly accept the same.	As per RFP, however It is also acceptable
209	MD/WZ/06/PUR/TS-1942	Schedule-IV(B)	10. The boxes shall be specific to the meter mounted in it. Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.	Meter box is fully transparent and only danger and manufacturer logo is embossed on it. Kindly accept the same.	As per RFP

210	MD/WZ/06/PUR/TS-1942	Annex-A (GTP)	Note: Meter Cover should be ultrasonically welded. The meter shall be encapsulated/ chemical welding with break to open type designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design	Meter base and cover are chemically welded with break to open feature and sealing provision. Kindly accept the same.	As per RFP
211	MD/WZ/06/PUR/TS-1942	Annexure-B	14 Communication protocol standard 2 nos. galvanically isolated optical port i.e.,. 1 NO galvanically isolated optical port for load survey facility etc. Optical Port and NIC Module will be provided in meter	Kindly accept meter with one nos galvanically isolated optical port.	Shall also be accepted as per IS16444
212	MD/WZ/06/PUR/TS-1942	Annexure-B	c) Meter cover i) Material As above Transparent Polycarbonate	Meter cover will be opaque. Kindly accept the same.	Shall also be accepted
213	MD/WZ/06/PUR/TS-1942	Annexure-B	Note:- Meter cover should be ultrasonically welded with base as per specification. In case of encapsulated design base and top cover shall be chemical welded.	Meter base and cover are chemically welded with break to open feature and sealing provision. Kindly accept the same.	As per RFP
214	MD/WZ/06/PUR/TS-1942	Annexure-B	5.12.1 Provision shall be made for maximum demand reset push button complete with provision to seal the MD reset push button.	For 3PWC consumer metering MD reset na be performed automatically on pre-defined date. Kindly accept the same.	As per RFP
215	MD/WZ/06/PUR/TS-1942	Annexure-B	9. A lithium battery of adequate storage energy shall be used for energy supply to real time clock during no voltage or power off condition.	All smart meters are connected with HES and read on daily basis. We are not promoting manual meter reading of smart meters. However meter does not have provision for reading on no power condition.	As per RFP
216	MD/WZ/06/PUR/TS-1942	Annexure-B	TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate) 2. The meter box should be unbreakable un-deformable and should withstand the temperature up to 140 deg. cent.	The meter box should be unbreakable un-deformable and should withstand the temperature up to 130±10 degrees centigrade. Kindly accept the same.	As per RFP
217	MD/WZ/06/PUR/TS-1942	Annexure-B	5. The top cover of the meter box should be of Hinge type having at least 2 nos. U clamps to hold the cover with base with tamper proof sealing arrangement.	Meter box have snap fit arrangement with sealing provision made of PC material. Kindly accept the same.	Shall also be accepted as per design of box
218	MD/WZ/06/PUR/TS-1942	Annexure-B	9. The top cover of meter Box should have spring loaded push button with spindle in moulded barrel perfectly in alignment to operate push button of the meter to read display parameter on push button mode. Spring loaded push button/ Capacitive Touch Keypad can be accepted.	Meter box have separate window to access Capacitive Touch Keypad of meter. Kindly accept the same.	As per RFP. However it is also accepted
219	MD/WZ/06/PUR/TS-1942	Annexure-B	10. The boxes shall be specific to the meter mounted in it. Thus, the Serial Number of the meter should be indelibly engraved /marked on the base of meter box as well as on the cover of meter box.	Meter box is fully transparent and only danger and manufacturer logo is embossed on it. Kindly accept the same	As per RFP
220	MD/WZ/06/PUR/TS-1942	Annexure-C	Annexure C : DLMS COMPIANT, CATEGORY-D3, LT CT OPERATED THREE PHASE 4 WIRE LCD DISPLAY METER, CLASS 0.5s (7) DISPLAY PARAMETERS (On pressing of push button i.e., billing parameters): vi) Average PF to be provided for previous 6 months.	Average PF to be provided for previous 3 months will be available on meter display. However 12 nos history will be available in meter which can be viewed at HES /BCS. Kindly accept the same.	As per RFP

221	MD/WZ/06/PUR/TS-1942	Annexure-C	(21) CONSTRUCTION OF THE METER: - (21.1) Meter Case: - The Top cover & Module cover must be translucent.	›ter case will be opaque (off white). .dly accept the same.	Shall also be accepted
222	MD/WZ/06/PUR/TS-1942	Annexure-C	(22) SEALING OF THE METER: - The meter body sealing screw shall be provided with good quality 6 digit Numbered polycarbonate seals are any superior body sealing arrangement with embossing on sides, one side with the logo of the firm and other side "[UTILITY]". The Nos of the seals shall be unique and should not be repeated in any case.	Meter does not have provision for sealing screw (Screw less design). However it have sealing provision between meter base and cover. Kindly accept the same.	Shall also be accepted as per design of meter
223	MD/WZ/06/PUR/TS-1942	Annexure-C (GTP)	Note:- Meter cover should be ultrasonically welded with base as per specification. The meter shall be encapsulated designed or ultrasonically welded base and top cover separated but chemical welded in case of encapsulated design	Meter base and cover are chemically welded with break to open feature and sealing provision. Kindly accept the same.	As per RFP
224	MD/WZ/06/PUR/TS-1942	Annexure-C, D	(22) SEALING OF THE METER: - The meter body sealing screw shall be provided with good quality 6 digit Numbered polycarbonate seals are any superior body sealing arrangement with embossing on sides, one side with the logo of the firm and other side "[UTILITY]". The Nos of the seals shall be unique and should not be repeated in any case. Manufacturer's Seals a) On the meter body one sealing screw shall be provided with good quality 7 digits numbered polycarbonate seal or any superior body sealing arrangement with embossing on sides. One side with the logo of firm and other side MPPKVVCL Indore.	Meter having screw less design with break to open feature and provision of sealing may also be acceptable. On PC seal one side with the Name of firm and other side MPPKVVCL Indore. Kindly accept the same.	As per RFP
225	MD/WZ/06/PUR/TS-1942	Annexure-D	Load Survey Capability ix) PF (Import) & PF (Export) both	Average power factor will be provided in load survey. Kindly accept the same.	As per RFP
226	MD/WZ/06/PUR/TS-1942	Annexure-D	Anti-Tamper features iv. instantaneous power (KW, KVAR & KVA)	Instantaneous power (KW) will be captured along with events. Kindly accept the same.	As per RFP
227	MD/WZ/06/PUR/TS-1942	Annexure-D	Meter Case E) Top Cover: High impact strength flame retardant, UV Stabilized polycarbonate/ Engineering plastic. Colour : Opaque/Transparent Top cover and base should be ultrasonically welded and cover should be break to open type. In case of encapsulated design chemical welding should be provided with proper fixing and sealing arrangement.	Meter base and cover are chemically welded with break to open feature along with sealing provision. Kindly accept the same.	As per RFP
228	MD/WZ/06/PUR/TS-1942	Annexure-A, B, C, D	A .2: Application of abnormal voltage/frequency: Note:-Application of 35kV and Jammer shall be when meter with communication module is placed inside of meter box and without communication module when meter is placed outside of meter box.	Meter shall be tested with communication module for Application of 35kV and Jammer. Kindly accept the same.	As per RFP

229	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Payment Mechanism (GCC); Clause 5.2.7	In order to ensure adequate funds for timely payment to the AMISP, the Utility shall ensure an Escrow account	It is recommended for Institutionalisation of DDF Mechanism as per SBD released by REC under RDSS	As per RFP
230	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Payment Mechanism (GCC); Clause 5.2.8	Lumpsum upfront amount will be paid to AMISP on installation of Smart meters. The amount will be paid to Discom using GoI grant through TSA (Treasury Single Account) as per RDSS guidelines.	Provision of interest to be placed if payment not released in 45 days as per SBD released by REC.	As per RFP
231	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements; Clause 9.1 (Accuracy Testing);	AMISP to ensure 100% Testing of Meters from Purchaser's Meter Testing lab to check the accuracy class of the meters as per IS, before installation and Transportation of Meters for this activity shall be in AMISP's scope.	Utility to provide locations of testing labs and their capacity. Since AMISP is responsible it is pertinent to know about the location of the testing labs and their capacity as it would be required to frame the implementation plan. Further, AMISP shall not be held responsible in case of any delays due to testing of meters once submitted at utility testing Labs.	To be informed to successful bidder after placement of LOA
232	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements; Clause 1.4 A(k)	The AMISP shall use the alternate SIM cards from minimum 2 Service providers for data transfer from DCU / Router / Gateway to HES and shall bear the recurring charges for 4G/5G SIMs / MPLS connectivity / Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide 2 different telecom service provider SIMs	Please clarify if the utility wants A dual SIM NIC card with one operational SIM Or A dual SIM NIC card with 2 operations SIMs – This would have fixed higher cost due to increased rental of stand-by SIM.	This should be maintained at Overall System level
233	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements; Annexure L ;	AMISP shall be responsible for integration of its HES/MDM with · Billing system · Discom MDM/ Enterprise service bus/any Centralize repository	Clarity required, whether MDM of utility will be integrated with AMISP HES or AMISP needs to develop separate MDM	AMISP needs to develop separate MDM
234	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 7. Contract Forms and Conditions of Contract; Clause no. 5.2.17	Additional Payment structure	Supplementary invoicing – various other scenarios needs to be considered viz. load enhancement/curtailment, Temporary / permanent disconnection, temporary connections, etc.	As per RFP
235	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project; Requirements Clause 7.7 (point no. 4)	Scheduled Billing Profile SLA: The SLA combines two conditions— · **99.5% data within 72 hrs, and** · **Remaining 0.5% within 168 hrs— but applies a common penalty, resulting in disproportionate penalties (up to 1.5% for a 0.6% deviation).**	Define **separate penalties** as follows: 1. 99.5% within 72 hrs – 0.5% deduction per 0.5% shortfall, capped at 2.5%. 2. Remaining 0.5% within 168 hrs – 0.5% deduction per 0.5% shortfall, capped at 0.5%. 3. Total maximum penalty: 3%.	As per RFP
236	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements; Clause 7.7 (point no. 9)	Prepaid Top-Up/Credit Recharge	Delays may occur due to payment gateways or cash counter reconciliation, beyond AMISP's control. Recommendation: Since identifying affected transactions is difficult, the penalty clause should be revised to ensure fair attribution and avoid undue penalization for third-party delays.	As per RFP
237	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements (NOMC); Clause 2.6 – 2.6.2 (c)	2 Gbps internet connectivity	2 Gbps internet connectivity Is not required for the operation at NOMC since all operations are hosted on cloud. From our experience only 10-50 mbps internet connectivity is sufficient. Further, it is recommended to allow internet connectivity expandable upto 2Gbps.	As per RFP

238	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements (NOMC); Clause 12 – Project Implementation Milestone	Pt. 8 - Installation Milestone	Certification of installation milestones should be carried out category-wise. In few discoms viz. CSPDCL, DT meter installation is delayed due to the non-availability of DT infrastructure, which is beyond the scope of the AMISP. Therefore, the AMISP should not be penalized for delays arising from infrastructure-related issues	As per RFP
239	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6. Project Requirements (NOMC); Clause 1.4 A(j) – Brief Scope of Work	In future, Discom is also planning to develop their new Central Repository System which will be owned by Discom, it is also responsibility of AMISP to provide necessary integration and connectivity upto Central Repository System.	We request to provide the Details, as at later stage it may require higher costing since the effort required for Integration and Connectivity to such system is unknown.	The development, ownership, hosting, and maintenance of the Central Repository System shall remain in the scope of the Discom. AMISP have to provide connectivity & integration. This will not be treated as a Change Request and the time lines will be informed to successful bidder during contract period.
240	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work A.	F. Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system as per Clause 7 of this Section.	Utility to provide Go-live to AMISP in case they are unable to provide readiness for the following; 1. prepayment roll-out 2. Integration due to non readiness at utility end.	As per RFP
241	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work A.	e. Consumer portal and mobile application as per Clause 2.5 of this Section;	It Should be restricted to Additional Development of Web Page and Mobile APP SDK file which can further be integrated with existing Utility Mobile Application . We are sure that Utility wants to give unified experience to all consumer base irrespective of Lot area under the various upcoming AMI tenders.	As per RFP
242	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work A.	j. In future, Discom is also planning to develop their new Central Repository System which will be owned by Discom, it is also responsibility of AMISP to provide necessary integration and connectivity up to Central Repository System.	Discom Must Specify the Bandwidth requirement and Location where the connectivity be provided. We need to check for Technical feasibility of the telecom service providers.	The development, ownership, hosting, and maintenance of the Central Repository System shall remain in the scope of the Discom. AMISP have to provide connectivity & integration. This will not be treated as a Change Request and the time lines will be informed to successful bidder during contract period.
243	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work A.	m. For every 50,000 meters, one workstation console needs to be provided by AMISP. For every 50,000 meters, one workstation console (Including Desktop, Office Table, Chair and 2 visitor Chairs) needs to be provided by AMISP will be provided extra as the material related to NOMC. The clause related to deployment of PCs at Corporate and Circle level will also remain the same	Workstation on every 50000 meters is not appropriate requirement.	As per RFP
244	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work A.	H. a. Dismantling of existing meter boxes and meter boxes along with necessary items like CT'S, lugs etc. as per the guidelines of the Utility. The installation work of meter boxes, etc. should be carried out as per the safety guidelines of the Utility, while meeting all requisite quality standards.	Utility to Facilitate the Local Decentralized Stores Location, where the dismantled Material to be returned.	As per RFP

245	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – Project Requirements 1.4 Brief Scope of Work	H. b. All meter installations at user accessible height. The above may be reviewed on case-to-case basis with inputs from the Utility.	Any Additional Service Cable Required for Shifting the Meter from Inside to outside of the premise to be taken care by utility. We understand that there is No – Height Activity to be done by AMISP like Service Cable Connection/Disconnection / Removal at/from Pole.	As per RFP
246	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 6 – 2.4.6 Prepaid Functionality	d) Prepaid consumers shall be provided facility to recharge their account by logging on to the consumer portal/app as per Clause 2.5 of this Section. I. The user interface shall be integrated with the present online payment gateway of the utility. Additional payment gateways shall be implemented if required ii. The payment gateways shall facilitate payments through on-line banking, credit cards and payment wallets	Payment Collection through Online is in Utility Scope. Utility will send the collected amount information to Prepaid application for further update in consumer account in MDM, However, Utility is responsible to give the recharge amount to AMISP after deduction of any arrears of respective consumer.	As per RFP
247	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 4 - Form 10	Format of Power of Attorney by Sole Bidder authorising an Individual Designated Representative for the Consortium	Is it necessary to submit a specific PoA as per the given format for this bid, or does a general PoA issued in the name of the Authorised Representative work?	As per RFP
248	2026_MPPKV_488566_1 (Lot-2, Ujjain region)	Section 4 - Form 20	Pre-Contract Integrity Pact	Is it necessary to get the Pre-Contract Integrity Pact signed by the CEO of the company, or can the Authorised Representative holding the Power of Attorney sign the same?	Represensentative who has been duly authorized should sign
249	TS- 1942	8	8.Qualification Requirement Technica requirements	As per the Standard Bidding Document (SBD), the technical qualification requirement for experience in integration of Head-End System (HES) with Meter Data Management (MDM) specifies experience for at least 20,000 consumers/end points (cumulatively) in an Indian or Global utility (power/water/natural gas/telecom) within the last seven (7) years, with systems operational for at least one (1) year. However, in the MP Tender, this requirement has been modified to mandate experience for at least 50% of the RFP consumer/end points (cumulatively) under similar conditions. The increased threshold may significantly limit participation of otherwise qualified and experienced bidders, including firms with proven large-scale HES–MDM integration experience. This could reduce competition and potentially lead to higher project costs. We request that the Technical Qualification Requirement be amended to align with the SBD, as follows: "Sole/ Lead Bidder/ any other Consortium Member must have experience of integration of head-end system with MDM on standard interfaces and data exchange models for at least 20,000 consumers / end points (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last seven (7) years which are in operation for at least one (1)year."	As per RFP

250	TS- 1942	26	D.Award of Contract26.Award Criteria	With reference to Clause 26.3, it is stated that the successful bidder (or lead bidder in case of a consortium) shall be awarded only one lot under the ongoing AMISP bids issued by MPMKVVCL, and that participation in other lots will result in technical disqualification. We request that the clause be reconsidered to allow a bidder to be awarded more than one lot, as the quantity in each lot is relatively low. Allowing award of multiple lots to the same qualified bidder will ensure better participation, optimize resources, and help the Discom achieve efficient and timely deployment.	As per RFP
251	TS- 1942	1	1.Overview of theAMISP Scope of Work	With reference to the project area profile, the tentative key details indicate a total of 953,482 meters spread across Betul (O&M), Bhopal (O&M), Harda (O&M), Narmadapuram (O&M), Raisen (O&M), Rajgarh (O&M), Sehore (O&M), and Vidisha (O&M). In order to carry out a detailed assessment of deployment, resource planning, communication infrastructure, and integration activities, we request that the division-wise and sub-division-wise breakup of the total meter count be provided. This information will enable bidders to plan technical and commercial proposals accurately and ensure proper resource allocation.	As per RFP
252	TS- 1942	2.3	2.3 Head End System (HES)	With reference to the requirement that the HES shall store raw data for a minimum of 45 days before transferring it to the MDM, we request that this clause be amended to align with the SBD, i.e., to store raw data for a minimum of 3 days. Maintaining 45 days of raw data at the HES level will significantly increase storage and operational costs, whereas a 3-day retention period is sufficient for timely transfer, processing, and reconciliation of meter data, without impacting billing accuracy or system functionality.	As per RFP
253	TS- 1942	2.7.3 2.7.3.1	2.7.3 Cloud Service Providers (CSP) 2.7.3.1 General Condition	With reference to the requirement that the project shall use GI (MeghRaj) or MeitY-empanelled cloud service providers, preferably Government Community Cloud providers, we request clarification on whether non-government empanelled cloud service providers can also be considered. Allowing such providers, subject to meeting security, compliance, and	As per RFP

254	TS- 1942	1.4	1.4 Brief Scope of Work	With reference to the requirement that the Meter Data Management system (MDM) shall have prepaid functionality, either as part of the MDM or through a separate prepayment application, and shall be deployed on the cloud as per Clause 2.4, we request clarification on whether the MDM will be provided and implemented by the bidder as part of the scope of work. Kindly confirm if our understanding is correct	It is clarified that the bidder shall be responsible for supply, installation, integration, testing, and commissioning of a new MDM . The bidder shall also ensure integration of the proposed MDM and HES with the existing Utility database , billing system and any other system to be developed by Discom in future.
255	TS- 1942	27	27 CURRENTAND VOLTAGE CIRCUITS	With reference to the requirement that the cross-section of the current circuit shall withstand a temperature rise of 50°C over ambient at maximum current and that PT-less design shall be used for power supply to the PCB, we would like to inform that our meters use an SMPS-based power supply, which ensures stable and efficient operation while eliminating the need for PTs. We request that SMPS-based design be accepted, as it meets the intended purpose of reliable power supply to the PCB and safe operation under maximum current conditions.	As per RFP
256	TS- 1942	33.2	33.2 SEALING ARRANGEMENT	With reference to the requirement that sealing screws shall have patented lash wire tamper-proof polycarbonate seals with laser-marked serial numbers matching the meter serial number, company logo, and utility logo, we request clarification on whether it is mandatory for the serial number on the seals to exactly match the meter serial number, or if a unique serial number on the seals (traceable to the meter) would be acceptable. Kindly clarify	As per RFP
257	TS- 1942	33.3	33.3 SEALING ARRANGEMENT	With reference to the requirement that the serial number of the meter be indelibly engraved/marked/laser-etched on both the base and cover of the meter box for traceability and verification of seals, we would like to clarify that our hinge-type meter box design allows the serial number to be provided either on the base or on the cover. We request that this arrangement be accepted	As per RFP
258	TS- 1942	41	41 NAME PLATE AND MARKING	With reference to the requirement that the connection diagram of the meter be clearly shown on the nameplate, we would like to inform that we will provide the connection diagram on the terminal cover (TC). We request that this arrangement be accepted	As per RFP

259	TS- 1942	27 of Annexur e- A	Type of push button arrangement	We request acceptance of our spring-action push button with con bush for 20–60A meters, which provides better durability and reliability while fulfilling the intended functionality.	As per RFP
260	TS- 1942	29 of Annexur e- A	Schedule-IV(B)	With reference to the requirement that the top cover of the meter box should have a spring-loaded push button with spindle in a moulded barrel to operate the meter push button, we would like to inform that our design provides a spring-action push button with a silicon bush, which offers better durability, tactile response, and reliability than the conventional design. We request that this design be accepted	As per RFP
261	TS- 1942	3 of Annexur e- B	5 Constructional Requirements Material Used for Meter case and Hinge type Meter Box	With reference to the requirement that the meter casing material should be glass reinforced, flame retardant, unbreakable engineering plastic, and that the terminal block shall be glass reinforced (10–20%) while all other casing shall be polycarbonate as per IS 15884, we request that this material specification be accepted. Our proposed design meets the intended purpose of high reliability, long trouble-free life, electrical safety, and resistance to fire and temperature, in line with standard industry practice.	As per RFP
262	TS- 1942	9 of Annexur e- B	25.2 TERMINALS, TERMINAL BLOCK AND COVER	With reference to the requirement that terminal holes shall be a minimum of 9.5 mm to accommodate conductor insulation and ensure proper grip, we request acceptance of the following standard industry practice: for 10–60 A meters, terminal hole size of 8.5 mm; for 10–100 A meters, terminal hole size of 9.5 mm. This arrangement ensures secure electrical connections, proper contact pressure, and eliminates the risk of loosening or undue heating, while complying with the intended functional requirements.	As per RFP
263	TS- 1942	9 of Annexur e- B	25.6 TERMINALS, TERMINAL BLOCK AND COVER	With reference to the requirement that the terminal block shall have provision with single/two screws for fixing to the meter board and that the meter shall not be removable without removing the screws from the terminal block, we request acceptance of our design where the bottom meter mounting screw is located in the meter base under a sealable terminal cover. Once the terminal cover is sealed, the mounting screw is not accessible, which ensures the same security and tamper-proofing as intended in the RFP.	Shall also be accepted as per design of meter
264	TS- 1942	10 of Annexur e- B	29.CONNECTIONDIAGRAM &TERMINALMARKINGS	With reference to the requirement that the connection diagram of the meter shall be clearly shown on the nameplate and also be available on the terminal cover, we request that it be acceptable to provide the connection diagram on the terminal cover only, as it is sufficient for installation purposes. This approach ensures clear visibility for installers while maintaining meter aesthetics and durability.	Shall also be accepted
265	TS- 1942	10 of Annexur e- B	26 CURRENT AND VOLTAGE CIRCUITS	With reference to the RFP clause mentioned below : The current and voltage circuits shall be made of appropriate material such as enamelled copper wire of EC grade. The current circuit shall be appropriately insulated and potential circuit shall be appropriately encapsulated. Kindly provide additional clarity regarding this requirement.	As per RFP

266	TS- 1942	11 of Annexur e- B	34.2 Sealing Arrangement	With reference to the requirement for at least two sealing screws of nickel-plated steel/brass with specific hole diameters, patented lash wire tamper-proof polycarbonate seals, and sealing from the bottom of the extended flange, we would like to highlight that each manufacturer has its own design approach. Our meters feature a base and top cover with additional sealing provisions and sealing holes, which ensures proper sealing and tamper-proofing, fulfilling the intended purpose. We request that our sealing arrangement be accepted, as it meets the security and functional objectives specified in the RFP.	As per RFP
267	TS- 1942	21 of Annexur e- B	Schedule-II(B) TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate)	With reference to the requirement that the top cover of the meter box should have a spring-loaded push button with spindle in a moulded barrel to operate the meter push button, we would like to inform that our design uses a spring-action push button with a silicon bush, which provides better durability, tactile response, and reliability than the conventional design. We request that this design be accepted, as it fulfills the intended functionality of reading display parameters while ensuring enhanced performance and user experience.	As per RFP
268	TS- 1942	21 of Annexur e- B	Schedule-II(B) TECHNICAL SPECIFICATION OF HINGE TYPE METER BOX MADE OF ENGINEERING PLASTIC (Polycarbonate)	For our hinge-type meter box, the serial number will be provided either on the base or on the cover. We request acceptance of this arrangement, as it ensures proper meter identification.	As per RFP
269	TS- 1942	44 of Annexure- B	9.1 Data Security:	We provide meters with batteries having 10-year life, eliminating the need for replacement. Hence, we request that the requirement for on-site battery replacement under weak battery condition be deleted.	As per RFP
270	TS- 1942	44 of Annexur e- B	11.CommunicationPort &CommunicationProtocol	With reference to the RFP clause mentioned below: Meters shall have two number galvanically isolated ports one for collection of data for load survey and other parameters through the meter reading instrument which can also be subsequently connected to a GSM/GPRS/RF Media for remote metering and other for remote meter reading purpose only. The load survey port shall have optical coupler for transfer of data from meter	As per RFP
271	TS- 1942	45 of Annexur e- B	11.CommunicationPort &CommunicationProtocol	With reference to the RFP clause mentioned below: The port for load survey data collection shall be suitable to receive the coupler of CMRI and certain changes in the meter configuration as discussed elsewhere in the tender should be possible through this port and only through this port. Kindly provide additional clarity regarding this requirement.	As per RFP
272	TS- 1942	47 & 57 of Annexur e- B	21(ii) Fixing/sealing arrangement - Sealing of meter cover to Base and 14.1 Connection Diagram & Terminal Marking	With reference to Clause 21(ii) – Fixing/Sealing Arrangement, which specifies that the sealing of meter cover to base shall be done with 2 screws tightened from the rear, and Clause 14.1 – Connection Diagram & Terminal Marking, which requires that sealing screws be tightened from the top cover to the base, we note that these two clauses are contradictory. We request that the tender allow sealing screw tightening from the top, in line with standard industry practice, to avoid confusion and ensure proper sealing during meter installation	One galvanically isolated optical port and another port is used for NIC card

273	TS- 1942	48 of Annexur e- B	18.2 Minimum Testing Facility	With reference to the requirement that the manufacturer should have a duly calibrated ESS meter of Class 0.1 accuracy, we would like to inform that our test bench is equipped with a Class 0.02 ESS meter, which offers higher accuracy than Class 0.1. We request that the use of a Class 0.02 meter be accepted, as it meets and exceeds the required accuracy standards, ensuring precise calibration and testing.	As per RFP
274	TS- 1942	48 of Annexur e- B	18.Quality Assurance in Manufacturing/Testing 18.1 Manufacturing Activities	With reference to the requirement that all meters shall undergo an aging test (kept in ovens for 72 hours at 55°C under full load and real-life conditions prior to final testing and calibration), we would like to inform that our meters are subjected to HALT & HASS tests during the design and development phase, which effectively addresses the same purpose of identifying infant mortality and ensuring reliability. We request that HALT & HASS testing be accepted in lieu of the 72-hour oven aging test, as it ensures equivalent or higher validation of meter reliability.	As per RFP
275	TS- 1942	56 of Annexur e- B	17-e) Screw	With reference to the requirement for screw size M-8 and length as per the inner diameter of the terminal hole for proper gripping and tightening, we note that M-6 screws are generally used in industry practice for such connections. We request that the tender allow the use of M-6 screws, which are widely available and sufficient for proper cable tightening, to ensure compliance with standard practice and ease of maintenance.	As per RFP
276	TS- 1942	57 of Annexur e- B	21 Fixing/sealing arrangement	With reference to the requirement for the minimum size of flanges for tightening the sealing screws—Terminal Cover: 6 mm, Meter Cover: 10 mm (including top cover and base flanges)—we request clarity on whether these dimensions refer to the total flange thickness or individual flange components. Clear guidance is requested to ensure proper design, manufacturing, and compliance with sealing requirements.	As per RFP
277	MD/WZ/06/PUR/TS-1942	8.1.B4 Bidder Qualification Requirements:	B. Head End System (HES) solution provider – Technical Requirements B4. The Proposed HES should have been implemented for at least [50% RfP] consumers / end points (cumulatively) in an Indian / global utility (power / Water / Natural Gas / Telecom) in the last 7(seven) years which are in operation as on date of Bid Submission	We request for amendment of the clause as mentioned below: B. Head End System (HES) solution provider – Technical Requirements. B4. The Proposed HES should have been implemented for at least [10% RfP] consumers / end points (cumulatively) in an Indian / global utility (power / Water / Natural Gas / Telecom) in the last 7(seven) years which are in operation as on date of Bid Submission. Hence, we kindly request you to amend this clause in line for fair participation and competitive price.	As per RFP

278	MD/WZ/06/PUR/TS-1942	8.1.2 Bidder Qualification Requirements:	Sole/ Lead Bidder/ any other Consortium Member must have experience of integration of head-end system with MDM on standard interfaces and data exchange models for at least [50% of RFP] consumers / end points (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last 7 (seven) years which are in operation for at least 1 (one) year Or Sole/ Lead Bidder/ any other Consortium Member should have installed, integrated, tested, and commissioned control centre hardware (or on cloud) and application software for at least [100% of RfP] endpoints (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in last 7 (seven) years which are in operation for at least 1(one) year	As per SBD V.4 issued by the REC the given clause section 2 hnical requirement point no. 2 are: Sole/ Lead Bidder/ any other Consortium Member must have experience of integration of head-end system with MDM on standard interfaces and data exchange models for at least [20,000] consumers / end points (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in the last 7 (seven) years which are in operation for at least 1 (one) year. Or Sole/ Lead Bidder/ any other Consortium Member should have installed, integrated, tested, and commissioned control centre hardware (or on cloud) and application software for at least [50,000] endpoints (cumulatively) in an Indian/ Global Utility (power/ water/ natural gas/ telecom) in last 7 (seven) years which are in operation for at least 1(one) year. Hence, we kindly request you to amend this clause in line with REC/MOP guidelines for fair participation and competitive price	As per RFP
279	MD/WZ/06/PUR/NIT-328/ TS-1942	Page No. 355 Clause no. 4	The initial performance security submitted by the Selected Bidder at the time of contract signing shall be valid for a period of at least 6 months beyond the end of the installation milestone.	It is observed that the Performance Bank Guarantee (PBG) percentage is not clearly specified in the RFP document. We request you to kindly clarify the applicable PBG percentage.	As per RFP
280	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.- 3 Cl. 4 (5)	System mea thing Solidly grounded	Please clarify these clause	The term 'System earthing solidly grounded' refers to solid grounding of the system neutral in accordance with applicable Indian Standards and utility practices.
281	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-3 Cl. 5. (ii)	CONSTRUCTIONAL REQUIREMENTS: The meter casing material should be glass reinforced,	Meter block will be glass reinforced, meter case will be unbreakable engineering plastic. Kindly accept it	As per RFP
282	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-5 Cl. 14.1	The LT meters shall have bright LCD Electronic display with backlit & with minimum 6 digits to read up to one tenth of KWh with another digit for legend. The decimal digits shall be clearly distinguished from integer digits.	Kindly accept 7 digit of same size	As per RFP. However, this option is also acceptable.
283	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-15 Cl. 26.8	The Extended Terminal Block Cover (ETBC) shall have a clear space of at least 25 mm, thus allowing sufficient clearance space for inserting cables.	Kindly accept the 17 mm ETBC for 5- 30A	As per RFP
284	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-16 Cl.29	METER FIXING ARRANGEMENT: Every meter shall have at least two fixing holes one at the top and one at the bottom. The top hole shall be provided with a special clip at the back of the meter so that holding screw is not accessible after the fixing of the meters. The lower fixing screws shall be provided on/with the terminal block under the terminal cover. It should be fulfil purpose/requirement of TS and necessary approval should be taken by bidder for specific design from competent authority.	Kindly accept one key hole at top, two holes on meter base, The lower fixing screws will be provided under the terminal cover	Shall be accepted as per design of meter
285	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-16 Cl. 30	30.CONNECTION DIAGRAM&TERMINAL MARKINGS: The connection diagram of the meter shall be clearly shown on the nameplate of meter and shall be of permanent nature. The meter terminals shall also be marked and this marking should appear in the above diagram. The connection diagram must be available on the terminal cover.	Kindly accept Connection diagram will be on the upper portion of the terminal cover only	Shall also be accepted

286	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-16 Cl. 33.2	SEALINGARRANGEMENT: At-least two sealing screws of Nickel plated steel / brass shall be provided for proper fixing of meter body (cover & base). Each sealing screw shall have two independent sealing holes. One hole should be provided in the head and one in the bottom portion. The diameter of the hole shall be 2.0 mm & 1.5 mm for the head and thread portion respectively. The sealing screw shall be tighten from the bottom of the extended flange on the meter body cover & base. The sealing screws shall be provided with patented lash wire tamper proof polycarbonate seals by the meter manufactures with additionally laser marked sr. no. matching with the meter sr. no., company logo and high rise logo of [UTILITY]. All the seals should be provided on front side only. Access to the working part should not be possible without breaking the seals.	Meter will be break to open and two nos meter to body sealing provision is provided, screw will be tighten from front and two cross sealing hole available on sealing screw head. Kindly accept it.	Sealing provision as per design of meter shall also be accepted ,
287	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-17 Cl. 33.3	SEALINGARRANGEMENT: The serial number of meter is to be indelibly engraved/ marked/ laser –etched on the base as well as the cover of the meter box, and can be easily viewed to check duplication attempts for the purpose of keeping track of meter seals with serial no. matching with that of meter.	Meter and Meter box seal serial numbers can be different. Kindly accept it	As per RFP
288	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-22 Cl.41 (vii)	NAME PLATE AND MARKING Bar coding of SN, Month & Year of manufacture	Kindly accept QR instead of Bar code	Shall also be accepted
289	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-22 Cl.41 (ix)	NAME PLATE AND MARKING: Connection diagram	we would like to confirm you that our connection diagram will be printed on terminal cover. Kindly accept it	connection diagram on terminal cover shall also be accepted
290	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-26 Cl. 48 (v). (d)	MANUFACTURING ACTIVITIES: Prior to final testing and calibration, all meters shall be subjected to accelerated ageing test to eliminate infant mortality.	We Will Provide Functional test of all meters. Kindly accept it	As per RFP
291	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-32, 33 Schedule-IV(D) (iii).(iv)	Schedule-IV(D) VERIFICATION / TESTING OF METERS SUPPLIED On receipt of consignment of subsequent lot in AMISP' stores, a set of 32 meters shall be selected randomly and sent to CPRI/ERTL/any third party NABL accredited laboratory at the discretion of Discom for conducting acceptance test as per the prescribed procedure. The Cost shall be borne by the AMISP. Voltage variation, Tamper & fraud protection, D.C. Immunity Test, Magnetic Immunity test (Permanent magnet test of 0.27 Tesla), Accuracy test after application of 440 Volts for 5 minutes, Imax for 30 minutes test, D.C. Injection test, Approx. 35 KV high voltage /high frequency burst test, remote loop induction device (jammer) test, Shock test and Fast transient burst test.	Fast transient burst test is not included in routine test and acceptance test as per IS 16444 Part 1. kindly clarify this clause	As per RFP
292	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-A Page no.-37 GTP 30	GTP 30. Fixing arrangement of name plate Plastic nameplate fixed inside the meter. It should contain all the details as per ISS	Kindly accept Metal name plate inside the meter	Metal name plate shall also be accepted
293	MD/WZ/06/PUR/NIT-328/ TS-1942	RFP Page no.-147 Cl. 1.4 . i	Brief Scope of Work: In case of three phase Whole current meter as mentioned in price bid, AMISP has to provide 75% Three Phase Smart Meter (10-100 Amp) and Balance 25 % will be Three Phase Smart Meter (10-60 Amp).	Kindly Provide technical specification of Three Phase Smart Meter (10-60 Amp).	Shall be shared with the successful bidder

294	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-18 Cl. 5.2.14	Provision shall be there to do the billing operation automatically at a predefined date by programming the meter accordingly, provision of programming minimum 12 billing dates shall be there. If required billing shall also be possible with the press of MD reset button. The default billing date shall be 1st of every month. However, this feature should be user programmable.	One button for scrolling one down button for MD reset (Total o no's Push button). Kindly accept it	As per RFP
295	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-20 Cl. 5.10	Load Survey: Load Survey :- As per IS applicable shall be IS:16444 Part -II & IS:15959 Part -III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days.	Please accept As per IS applicable shall be IS:16444 Part -I & IS15959 part II the load survey. The load survey data shall be recorded for a minimum period of45 days with an integration period of 30minutes.	As per RFP
296	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-23 Cl. 7.1	In addition reset of maximum demand shall be possible through push button or through a hand held terminal capable of communicating with the meter.	Please accept MD reset at end of predefined billing period is available. MD reset possible through mobile app through optical port connect with meter.	In addition reset of maximum demand shall be possible through push button and through a hand held terminal /Mobile App capable of communicating with the meter.
297	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-26 Cl. 11	COMMUNICATION PORT & COMMUNICATION PROTOCOL The Whole Current Static Meter for consumer metering should be DLMS open protocol conforming to IS 15959 for category 'D2' & Indian Companion Standard. The energy meter shall have a galvanically isolated optical communication port, so that it can be easily connected to hand held common meter reading instrument for data transfer to or from meter reading instrument with proper security and without error OR subsequently hooked to a remote metering device. The optical port shall be located in front of the meter and shall have adequate sealing arrangement to seal it. Serial communication protocol shall be adopted for data communication. In the forthcoming paragraphs requirement of a D -port telemetering purpose has been described. Meters covered under this tender will be employed for metering at the premises of LT consumers for tariff application. The instantaneous parameters load survey data and tamper information etc will be monitored remotely through computer installed in central station. The data from meter will be transferred to the central station through the either GSM / GPRS/RF communication links as meter are required to be completed with capability of remote meter reading. It will be obligatory on the part of the bidders to supply the software in adequate copy needed for remote meter reading. No separate cost towards remote meter reading software using GSM / GPRS technology/RF will be borne by the purchaser. The meters shall be compatible for AMR using GSM / GPRS /RF. The communication port shall be as per IS 16444.	Please accept meter have the one optical port and one additional port for over the air communication	Shall be accepted as per IS16444

298	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-27 Cl. 11.2	Meters shall have two number galvanically isolated ports one for collection of data for load survey and other parameters through the meter reading instrument which can also be subsequently connected to a GSM/GPRS/RF Media for remote metering and other for remote meter reading purpose only. The load survey port shall have optical coupler for transfer of data from meter to the meter reading instrument or modem as the case may be. In addition to this load survey port, provision shall be made for another D- port, which will be permanently hooked to the RTU/Modem/NIC for the purpose of remote meter reading. While designing this port due care shall be taken and it shall be ensured that damage to the meter/meter circuitry is not possible by injecting magnetic/ electrical charges through this D- port. A specific confirmation, that, these considerations have been taken care of, shall be made by the tenderer. Communication protocol standard- Meter shall have galvanically isolated communication port as per IS16444 i.e., one galvanically isolated optical port for load survey facility etc. & another for WAN/NAN communication module.		Shall be accepted as per IS16444
299	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-29 Cl. 14	CONNECTION DIAGRAM & TERMINAL MARKING:- The connection diagram of the meter shall be clearly shown on inside portion of terminal cover & shall be of permanent nature. Meter terminals shall also be marked & this marking should appear in the above diagram. CONNECTION DIAGRAM IS AVAILABLE ON T-COVER	Kindly accept Connection diagram will be on the upper portion of the terminal cover only.	Connection diagram on the upper portion of the terminal cover Shall also be accepted
300	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-29 Cl.14.1	The holes for lead sealing wire may be 2mm one hole should be provided in the head and one in the threaded portion and as per meter design necessary approval may be taken from competent authority. 2 NOS sealing screw for Meter Body and 2nos Sealing screw for Module cover and 2nos sealing screw for T-Cover will be provide. Each sealing screw having 2 hole on Head Portion. Hole in thread portion not due to screw thread must be enclosed in Meter Body. Sealing screw must tighten from Top Cover to base.	Meter will be break to open and two no's meter body sealing provision is provided screw will be tighten from front and two cross sealing hole available on sealing screw head. Kindly accept it.	Sealing arrangement shall also be accepted as per design of meter . Meter top cover and base shall be ultrasonic welded and it shall be break to open. Spotted welding and easily opening of cover may not be accepted
301	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-30 Cl. 18.1.(d)	Prior to final testing and calibration, all meters shall be subjected to aging test (i.e. meters will be kept in ovens for 72 hours at 55 deg. cent. temperature and atmospheric humidity under real life condition at its full load current. After 72 hours meters should work satisfactorily) to eliminate infant mortality.	Kindly accept functional Test of all meter.	As per RFP
302	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-30 Cl. 18.2.(ix)	MINIMUM TESTING FACILITIES: Vibration test	Vibration test is not included routine and acceptance test as per IS 16444 Part 1. Kindly clarify	As per RFP

303	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-35,36 Schedule -IV(D) (iii)	VERIFICATION / TESTING OF METERS SUPPLIED On receipt of consignment of subsequent lot in AMISP' stores, a set of 32 meters shall be selected randomly and sent to CPRI/ERTL/any third party NABL accredited laboratory at the discretion of Discom for conducting acceptance test as per the prescribed procedure. The Cost shall be borne by the AMISP. (i)Starting Current test and No load test 32 Nos. AC high Voltage test, Insulation test, Limits of error, Test of meter constant, Power consumption test. 8 nos. out of above 32 Nos. Repeatability of error 3 nos. out of above 8 Nos. Voltage variation, Tamper & fraud protection, D.C. Immunity Test, Magnetic Immunity test (Permanent magnet test of 0.27 Tesla), Accuracy test after application of 440 Volts for 5 minutes, Imax for 30 minutes test, D.C. Injection test, Approx. 35 KV high voltage /high frequency burst test, remote loop induction device (jammer) test, Shock test and Fast transient burst test. 3 nos. out of above 8 Nos.	Fast transient burst test is not included in acceptance test and utine test as per IS 16444 Part 1. Kindly clarify	As per RFP
304	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-2 GTP 15	Type of communication Meter should be compatible for reading through MRI	Kindly accept Reading through mobile application	Mobile app shall also be accepted
305	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-3 GTP 21 (ii)	Fixing/sealing arrangement ii)Sealing of meter cover to Base 2 nos., tightening from rear	Kindly accept 2 nos Meter Body sealing Screw Will be tightening from front.	As per RFP
306	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-3 GTP 22	Type of hinged undetachable terminal cover & size/ thickness of hinges Book(Door) type opening	Kindly accept ETBC with hinged (Up-to- Down type opening)	Shall also be accepted
307	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-B Page no.-3,4 GTP 23 (iv)	Performance of meter in tamper conditions iv)Indication on above tamper conditions LED indication	Kindly accept LCD indications will be as per display sheet.	As per RFP
308	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-C Page no.-8 Cl. 9	ELECTRONIC BILLING: - Sending a secure MD reset message to meter via the optical port shall cause a billing operation. Normally this option shall be disabled. However MD reset provision should be in line with ICS vide BIS IS 15959.	Kindly accept Secure DLMS MD Reset via Optical Port and over the air as per IS 15959 Part 3 will be provided	MD reset provision shall be enabled , it shall be reset by manual MD reset button, Through remote , Through local communication and predefined period
309	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-C Page no.-8 Cl.11	LOAD SURVEY: - As per IS applicable shall be IS:16444 Part-II & IS:15959 Part-III with latest amendment for category 'D3' LT CT operated meter for consumer metering. Block load profile parameters as per IS 15959 (Part 3): 2017 shall be recorded for 45 (Power ON) days data to be recorded with 15 minutes integration period. In addition, Daily load profile parameters as per IS 15959 (Part 3): 2017 shall also be recorded for 45 (Power ON) days. The register shall automatically rollover the data after 45 days based on first in first out (FIFO) basis. Survey block integration period shall be configurable for 15 min & 30 min, by defaults it should be provided in 15 minutes block for 45 days	Kindly accept Load Survey :- As per IS15959 part III For a minimum period of 45 days with an integration period of 30minutes	As per RFP

310	MD/WZ/06/PUR/NIT-328/ TS-1942	Annex-C Page no.-16 Cl. 23	CONNECTION DIAGRAM & TERMINAL MARKING: - The connection diagram of the meter shall be clearly shown on inside portion of terminal cover & shall be of permanent nature. Meter terminals shall also be marked & this making should appear in the above diagram. CONNECTION DIAGRAM IS AVAILABLE ON T-COVER The holes for sealing wire may be of 2mm. One hole should be provided in the head and one in the threaded portion.	We would like to confirm you that our connection diagram will printed on terminal cover. Kindly accept it	Connection diagram printed on terminal cover shall also be accepted
311	MD/WZ/06/PUR/TS-1942	Section 2, Clause 8.1	The net worth of the bidder should be at least (30%) of the estimated project cost in any of the three financial years (2021-22, 2022-23, 2023-24)	As per the general definition of "last three financial years," the applicable years should normally be 2022-23, 2023-24, and 2024-25. Kindly confirm the financial years to be considered for evaluating the Net Worth requirement.	As per RFP
312	MD/WZ/06/PUR/TS-1942	Section 3, Clause 17	Submission of Bids/ Proposal	Kindly accept the type tests in the form Google drive link considering eprocurement portal size constrain. We shall upload the complete type test of all meter manufacturers in Google drive, and the links shall be shared in Technical Bid.	Documents to be uploaded on MP-Procurement portal
313	MD/WZ/06/PUR/TS-1942	Section 3, Clause 26.3	Restriction of Bidder (Lead or Consortium/JV Partner) in a particular Lot Post financial opening of Bids (reverse auction), any Bidder (Lead or consortium/ JV partner) who has been selected in a particular Lot of a Discom will be deemed as disqualified for opening of financial bid in the next Lot of that particular Discom whether the Bidder has participated as a Lead or consortium/JV partner in the next Lot of that Discom.	Request you kindly amend the clause as below: Only the financial bids of bidders who meet the financial requirements will be opened. Bids will be opened in order of highest to lowest tender value. After each tender opening, the bidder's financial capacity (as per Clause 8.1.4, Section 2) will be reduced by the value of the tender if they are the lowest bidder (L1). Before opening the next tender, the updated financial capacity of all bidders will be checked. If a bidder's capacity is less than the value of the next tender, their bid will not be opened until they qualify for a lower value tender. This will ensure that the bidder has the capacity to invest equity in the projects if declared successful. The method has been already adopted by Assam, Chhattisgarh & Maharashtra for appointment of AMISP.	As per RFP
314	MD/WZ/06/PUR/TS-1942	Section 4, Form 1	The Bidder shall identify below the Consortium Members/ Sub-contractor(s) for major Project items. For sub-contractor a Letter of Intent (LOI) must be provided	According to Form 1 of Section 4 (Bidding Forms – Technical Proposal), the bidder is required to submit a "Letter of intent (LOI)" for each subcontractor of major project items that are identified within Form 1. Since bidders also have to submit legally enforceable form 22 (MAF) and form 23 executed between bidder and subcontractor, hence, kindly allow exemption from submission of LOI. If LOI is to be submitted, we request you to provide format of LOI.	As per RFP

315	MD/WZ/06/PUR/TS-1942	Section 7, Clause 5.2.6	Utility may dispute the amount payable and shall pay the undisputed amount of the payment due via Escrow account (as specified in Article 5.2.7) from the 11th (Eleventh) working day of every month till the 10th (tenth) working day of succeeding month.	Payment security mechanism (PSM) i.e. Direct Debit Facility (DDF) has been replaced with Escrow account which is a significant deviation from SBD and the REC Guidelines Ref. no REC/PMD/RDSS/22-23/285, dtd. 11.10.2022, Kindly note that DDF is the primary mechanism relied upon by lenders for financing AMISP projects. DDF ensures direct transfer of amounts from payment gateways to the Direct Debit Account, providing payment assurance to AMISP. In contrast, transfer to an Escrow Account is subject to a priority charge waterfall, where revenue is first allocated to existing and new lenders of the UTILITY for power procurement costs and O&M, and only thereafter, if any amount remains, it is available for AMISP. This represents a severe downgrade of payment security, making it difficult for lenders to fund the project at competitive rates. We request you to kindly reinstate the DDF provisions of SBD and share the format of the DDF Agreement.	As per RFP
316	MD/WZ/06/PUR/TS-1942	Section 7, Clause 5.2.6,	Utility may dispute the amount payable and shall pay the undisputed amount of the payment due via Escrow account (as specified in Article 5.2.7) from the 11th (Eleventh) working day of every month till the 10th (tenth) working day of succeeding month.	Kindly request you to provide the format of the Escrow Agreement to be signed between parties before submission of the bid.	Will be shared with successful bidder
317	MD/WZ/06/PUR/TS-1942	Section 6, Clause 7.7 Notes. Point 6,	Installation/Replacement of Smart meters in terms of replacement Burnt meter case/ Provide new service connection: AMISP will ensure to replace/install the new smart meter against the defective Smart meter / new service connection within the awarded area. The timeframe for installation/ replacement of Smart meters shall be as follows: 1.Meter installation related to New Service Connection - 4 days 2.Meter installation related to replacement of Burnt meter (Post intimation by Utility representative) - 3 days 3.Meter installation related to replacement of Defective meter (Post intimation by Utility representative) - 3 days	The General Conditions of Contract (GCC) outlined in SBD Version 4 are already very stringent. We request Utility to maintain the 15-days timeline in line with SBD for meter replacement as 3-4 days' time is impractical for any AMISP.	As per RFP
318	MD/WZ/06/PUR/TS-1942	Section 6, Clause 4	Consumer indexing will be carried out/verified for the incoming population of smart meters for end-to-end metering at contiguous electrical locations in the selected AMI Project Area and for dispersed metering of DTs/ Feeders at non-contiguous electrical locations in the selected AMI Project Area.	Kindly confirm our understanding that since DT and Feeder meters are not in scope of this tender & the consumer indexing by AMISP will be only carried for meter categories mentioned in BoQ	No change, consumer indexing and energy audit shall be carried out considering integration with Discom's CMDM systems and metering data of DTs and Feeders.

319	MD/WZ/06/PUR/TS-1942	Section 6, Clause 7,7 SLA	Service Level Agreement (SLA)	Kindly confirm our understanding that since DT and Feeder meters are not in scope of this tender, all the DT and feeder meter related SLAs/obligations are not applicable to AMISP and so, the maximum capping of 20% should be reduced accordingly.	It is clarified that DT & Feeder meters are covered under other AMISP scope. However, consumer indexing and energy audit shall be carried out considering integration with available MDM systems and metering data of DTs/Feeders, wherever available. The bidder shall comply accordingly.
320	MD/WZ/06/PUR/TS-1942	Section 6, Clause 9.1	Responsibility of Tests and Inspection AMISP to ensure 100% Testing of Meters from Utility's Meter Testing lab to check the accuracy class of the meters as per IS, before installation and Transportation of Meters for this activity shall be in AMISP's scope. However, this percentage can be reduced but not below 75% on the discretion of Utility. Further, in case of non-availability of capacity at Purchaser testing lab, such testing can be permitted at another NABL labs. However, the Utility may conduct communication and relay testing on the sample meters during the process of accuracy testing. It is the responsibility of the AMISP to provide necessary integration support with Utility Meter Testing Bench for communication testing and relay testing.	The testing requirements outlined in the SBD are already inline with all IS & very stringent. This additional testing will incur additional costs & also time; this shall impact Installation Milestone. We request you to please maintain the same without any further addition. Further, it is mentioned that in case of non-availability of capacity at Purchaser testing lab, such testing can be permitted at other NABL labs. Kindly confirm our understanding that cost of this testing at NABL labs including transportation, shall be borne directly by the Utility.	As per RFP
321	MD/WZ/06/PUR/TS-1942	Section 6, Clause 1.4 Brief Scope of Work, Sub-clause l	For every 50,000 meters, one workstation console needs to be provided by AMISP. For every 50,000 meters, one workstation console (Including Desktop, Office Table, Chair and 2 visitor chairs) needs to be provided by AMISP and will be provided extra as the material related to NOMC. The clause related to deployment of PCs at Corporate and Circle level will also remain the same	We understand AMISP shall provide one workstation for every 50,000 meters, kindly confirm who will be operating workstation console utility persons or AMISP	Hardware/ Resource requirement as per TS.
322	MD/WZ/06/PUR/TS-1942	Section 5, Section A, BoM	Service Cable	We understand that existing service cable shall be utilized by the AMISP for installation of Meters and in case of damaged service cable or new connections, the service cable shall be provided by the Utility. Kindly confirm.	Existing service cable & meter board shall be utilized by the AMISP for installation of Meters and in case of damaged service cable/Board or new connections, the service cable/ meter board shall be provided and installed by the Utility/consumer if required as per assessment of the discom. Other items such as Lugs & Fasteners etc. need to be arranged by the AMISP
323	MD/WZ/06/PUR/TS-1942	Section 6, Clause 1.10	The systems which are at risk of technical obsolescence over the operating life of the system should be identified; this should include end-of-sale and end-of-support policies governing the proposed technologies. Forward and backward compatibility need to be considered, and mitigation option shall be indicated in detail and shall not be limited to periodic update from OEM/System supplier	Kindly confirm our understanding the AMISP shall be responsible for the proper functioning of the system until the end of the Contract Period. Thereafter, the AMISP shall not be held liable for any risks associated with technical obsolescence. Upon expiry of the Contract Period, Utility shall assume full responsibility for the continued functioning of the system.	As per RFP

324	MD/WZ/06/PUR/TS-1942	Section 6, Clause 2.2,	Section 6, Clause 2.2, Communication Infrastructure The communication infrastructure should either be based on RF / R mesh network / PLCC /cellular network or a combination of these.	ndly confirm the following: Who will provide the SMS Servers? ii.Who will bear the SMS charges? iii.Kindy clarify for which services SMS shall be send to consumer. iv.Also, kindly provide the no. of SMS per meter per month shall be send to consumer	AMISP will bear SMS charges and manage SMS service
325	MD/WZ/06/PUR/TS-1942	Section 6, Clause 2.3, Head End System (HES)	The AMISP shall provide an HES which is suitable to support the collection and storage of data as per performance level for a defined no. of Smart Meters with facility of future expansion of additional 50 % of Meters as per the requirement specified in this document.	Kindly clarify whether additional HES licenses requirement to be considered in the current tender costing or utility shall compensate the license charges as and when utilized.	As per RFP
326	MD/WZ/06/PUR/TS-1942	Section 6, Clause 2.4.3 Meter Data c, & d	d) The archiving of data should be done at a frequency of [x] and all data older than [x] days/hours should be archived. AMISP's solution should describe the process of archiving and restoration from the archive.	We request you to kindly confirm the values for [x] mentioned in the clause (archiving frequency and age of data for archiving).	Data to be stored for contract period (10 Years from date of award) and the archiving will be done in after every 45 days
327	MD/WZ/06/PUR/TS-1942	Section 6, Clause 6, Analytics and Report,	a) Energy Audit	Our understanding is that DT and Feeder meters are not in scope of this tender, all the DT and feeder meter related analytics and report, also SLAs/obligations are not applicable to AMISP under this tender. Kindly confirm	It is clarified that Feeder & DT meters are covered under other AMISP scope. However, consumer indexing and energy audit shall be carried out considering integration with available MDM systems and metering data of DTs/Feeders, wherever available. The bidder shall comply accordingly.
328	MD/WZ/06/PUR/TS-1942	Sectio 6, Clause 7.7, Notes, point 9 & 10	I.AMISP shall be responsible for collection of billing data for all Smart Meters within a week of the scheduled periodic collection/ end of the billing period. In case of failure in data downloading through Smart-meter, AMISP will be responsible to arrange meter data for billing purpose as per billing schedule. II.AMISP shall be responsible for providing billing data for all the installed Smart meters even in case of non-communication of the meter.	In case of the non-communication of meters which are not attributable to AMISP shall not be held responsible for providing billing data. Please confirm.	AMISP will be responsible for the meter installed and managed by them only.
329	MD/WZ/06/PUR/TS-1942	Section 6, Annexure M, Clause 18	In case a bidder is participating in more than one Lot in a particular Discom with the same consortium/JV partners and the same OEM mix, and intends to demonstrate the same technology/platform for both the lots in a particular Discom, then only a single common demonstration shall be conducted and will be considered valid for both the Lots. The bidder shall, however, be required to submit the required form separately with each Lot at the time of bid submission.	We understand if the bidder is participating in more than one Lot in a particular Discom with the same consortium/JV partners and the same OEM mix, and intends to demonstrate the same technology/platform for both the lots in a particular Discom, then only a single common demonstration shall be required to conduct Kindly confirm.	As per RFP

330	MD/WZ/06/PUR/TS-1942-Lot-2 Ujjain Region	Section 6. Project Requirements , Pg-[illegible] Annexure M Guidelines for Technical demonstration for evaluation by Discom	**A. General guidelines for demonstration** ,3. Bidder will provide: i. 03 different makes of Smart meter with 3 different category i.e. 1 Single Phase, 1 Three Phase and 1 three Phase LTCT and one OEM make of Three phase CT/PT operated HT feeder meter i.e. total 10 Nos Smart Meter (they should be IS:16444 marked) along with communication module. OEM of these meters must comply OEM qualifications as specified in RfP along with OEM Authorization. For demonstration, the bidder has to bring three no. of Smart meters (1 single phase, 1 three phase whole current and 1 LTCT meter of different makes per OEM and one OEM make of Three phase CT/PT operated HT feeder meter), as bidder has to select 3 OEMs, you need to bring minimum 09 meters and one OEM make of Three phase CT/PT operated HTfeeder meter for demonstration. Each meter must comply with all provisions of IS:16444 and marked. The OEM of these meters must comply OEM qualifications as specified in RfP along with OEM Authorization. Please submit documentary evidence related to respective OEM of meter manufacturers at the time of demonstration.	**Clarification Request** We request confirmation on the following: Is it mandatory that all the above meter categories must be supplied by a single meter manufacturer? Or is it permissible to have multiple OEMs / technology partners for different categories? 3.Submission & Demonstration Requirement If it is mandatory that all categories must be from a single manufacturer (e.g., WAAREE as a meter manufacturer), kindly confirm whether WAAREE is required to supply: 1 No. Single Phase Meter 1 No. Three Phase Meter 1 No. Three Phase LTCT Meter 1 No. OEM Three Phase CT/PT operated HT Feeder Meter (Total 10 Nos., all IS:16444 compliant with communication modules) 4. **Request for Relaxation (New Entrant Consideration)** In this regard, we would like to submit that WAAREE, being a new entrant in the Smart Metering sector, currently has Single Phase Smart Meter as a ready and fully compliant product. Therefore, we request the authority to kindly: Allow participation with at least one available Smart Meter category, and Permit demonstration using the Single Phase Smart	As per RFP

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OFFICE OF THE MANAGING DIRECTOR
M. P. Pashchim Kshetra Vidyut Vitran Co. Ltd.
(Wholly Owned by Government of M.P. Undertaking)
GPH COMPOUND, POLOGROUND, INDORE
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No. MD/WZ/06/PUR/TS-1941 & 1942/ 7407 Indore dated 17 APR 2026

Amendment-3

Sub:-TS No. MD / WZ / PUR / 06 / 1941 (2026_MPPKV_487839_1) & TS- 1942 (2026_MPPKV_488566_1) for the RfP for the Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Smart Prepaid Metering on Design-Build Finance-Own-Operate Transfer (DBFOOT) basis in in the area of jurisdiction of Indore Region & Ujjain Region of MPPKVVCL Indore under RDSS schemes"- **Regarding reply of pre bid query & amendment in due dates extension thereof.**

Ref: -

1. NIT issued vide No. MD / WZ / PUR / 06 / NIT-328/4402 dated 02.03.2026.
2. Amendment to the NIT issued vide No. MD / WZ / PUR / NIT-328/5131 Indore dated 13.03.2026.
3. Amendment-1 issued vide No. MD/WZ/06/PUR/TS-1941&1942 /6433 Indore dated 02.04.2026-Regarding reply of pre bid queries & extension of due dated thereof.
4. Amendment-2 issued vide No. MD/WZ/06/PUR/TS-1941&1942 /7042 Indore dated 13.04.2026-Regarding extension of due dated thereof.

In reference to subject tender 1941 (2026_MPPKV_487839_1)&TS-1942 (2026_MPPKV_488566_1), following **Important Dates** mentioned in **Section-1. Request for Proposal Notice** of tender are hereby amended and same shall be read at all other places in the tender as follows:-

Important Dates

S.No.	Particulars	Date	Time
(1)	Last date for e-bidding	**23.04.2026**	15:00 Hrs
(2)	Date of Opening of Technical Bid(if possible)	**24.04.2026**	15:00 Hrs

Further, reply of pre bid queries are also attached here with.

All other terms and conditions of the tender shall remain same and operative.

NOTE: - Duly sealed signed copy of this **Amendment-3** please be submitted with online bid.

Chief Engineer (Purchase)
O/o MD (WZ), MPPKVVCL, Indore

Second Clarification against TS no. 1941 & 1942					
Sr. No.	Tender Specification No.	Reference Clause No.	Reference Clause Details	Bidder's Query / request	WZ comment
1	MD/WZ/06/ PUR/TS-1941 & MD/WZ/06/ PUR/TS-1942	Section 6, Clause 2.2,	Section 6, Clause 2.2, Communication infrastructure. The communication infrastructure should either be based on RF/ RF mesh network/ PLCC /cellular network or a combination of these.	As per the Bid document Daily prepaid billing including hourly billing is required along with various other services such as Recharge, Connect/ Disconnect, Outage, DSM related, etc. Factoring this if we consider 5 messages per customer per day at 10 paise per message Calculation: (for Ujjain region – for reference) Rs. 0.10 x 5 (no. of SMS per customer) x 365 (days in a year) = Rs. 183 (SMS cost per customer per Year) 1157868 (Total no. of Meters) x Rs. 183 (SMS cost per customer per Year) = Rs. 21.18 Cr. per year This is a huge cost to factor in the Bid and without proper clarity of scope it is very difficult to build it for the Bid. This would impact higher price discovery during the bidding process as without clarity higher costs could be factored in. We suggest to keep this out of scope of AMISP and have it in Utility's scope similar to UHVBN, CSPDCL, etc. However, if the utility wants to put it in AMISP's scope, request to clarify the following for proper cost calculation 1. What would be the count of messages required to be sent to per customer? 2. What type of messages (service classification) would be required to send? 3. Capping of SMS to per customer per day, if any? This would help in levelling the field for playing field for all bidders to take appropriate costings.	It has already clarified that AMISP will bear SMS charges and Manage SMS services. On an average maximum 5 Nos SMS/ consumer/ Day may required to be sent. The type of Messages (Service classification) will be as per RFP
2	MD/WZ/06/ PUR/TS-1941 & MD/WZ/06/ PUR/TS-1942	Section 6. Project Requirements; Clause 1.4 A(k)	The AMISP shall use the alternate SIM cards from minimum 2 Service providers for data transfer from DCU /Router/ Gateway to HES and shall bear the recurring charges for 4G/5G SIMs / MPLS connectivity/ Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide 2 different telecom service provider SIMs	As per the comment of utility what is the interpretation of "Overall System Level". Does utility want to have 2 telecom providers integrated for the project and AMISP can use the telecom provider at their convenience. Or Utility requires AMISP to maintain 2 telecom providers at each Meter level in case of cellular communication	The AMISP shall use SIM(s) from minimum two different Service Provider to ensure data transfer from nearby DCU /Router/ Gateway to HES and shall bear the recurring charges for 4G/5G SIMs / MPLS connectivity/ Internet Bandwidth, static ISP connection till completion of maintenance period. In case of cellular communication, AMISP also has to provide minimum 2 different telecom service provider's SIMs, however AMISP need not to maintain 2 telecom service provider's SIMs at each Meter level.