



ASSAM ELECTRICITY GRID CORPORATION LIMITED

OFFICE OF THE MANAGING DIRECTOR

Regd. Office:(FIRST FLOOR), BIJULEE BHAWAN, PALTANBAZAR; GUWAHATI - 781001

CIN: U40101AS2003SGC007238GSTIN: 18AAFCA4973J9Z3

PHONE: 0361-2739520Web: www.aegcl.co.in



No. MD/ AEGCL/SEM/SLDC/01/2021

Date: 24/12 /2021

REQUEST FOR PROPOSAL (RFP)

ASSAM ELECTRICITY GRID CORPORATION LIMITED, (“the Purchaser”) invites sealed quotations from reputed OEM/Manufacturers for the following works:

1. Supply, installation, Testing & Commissioning of SAMAST compliant 0.2 S CLASS ABT energy Meters (433 nos.) on existing metering panel for GSSs of AEGCL, to be installed at the T-D interface points and the supplied meters are to be integrated with network switch and Local PC for viewing & data downloading in the 70 nos. of GSSs of AEGCL.
2. Supply, installation, Testing & Commissioning of 0.5S CLASS LT Meters in Grid substations of AEGCL and the supplied meters are to be integrated with the local PC available at Substations through network switch.

Important Information:

<u>Sl</u>	<u>Description</u>	<u>Details</u>
1	RFP No and Date	MD/ AEGCL/SEM/SLDC/01/2021 Date: 24/12 /2021
2	Name of the Work	“Supply, installation, Testing & Commissioning of SAMAST COMPLIANT 0.2S CLASS ABT Meters and 05.S CLASS LT Meters at various Grid Substation of Assam Electricity Grid corporation Ltd”.
3	AMC Period	-
4	Type of RFP	Supply, Erection, Testing & Commissioning
5	Competition type	Indian (National)
7	RFP Processing fee	Participant has to pay Non-Refundable RFP Processing fee of Rs.1000.00 (Rupees One Thousand only) to be deposited via online through https://assamtenders.gov.in
6	EMD (in Rs.)	INR 12,50,000/- only
7	Specifications & Delivery Schedule	As per relevant Annexure
8	Price Schedule	As per relevant Annexure
9	Contact Person	CGM, SLDC, AEGCL, Kahilipara, Ghy-19
10	Contact email ID	Samastcell.slsc@aegcl.co.in
11	Mode of Bidding document	e-Tender
12	General Condition of Supply & Erections	All the Condition of Supply & Erections shall be as per GCC of AEGCL 2009 which is available at www.aegcl.co.in

Important Dates:

<u>Sl No.</u>	<u>Item Description</u>	<u>Date and time</u>
1	Start date and time of receipt of RFP	24/12/2021 (14:00 Hours)
2	Start date for bid submission	07/01/2022 at 14.00 HRS
3	End date for bid submission	17/01/2022 at 17:00 HRS



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4	Date and time of opening of the proposal	18/01/2022 at 14:00 HRS
5	Validity period of the RFP	180 days
6	Pre-RFP Meeting Date, Time and Venue	03/01/2022 (11:00 HRS) SLDC Conference Hall, Kahilipara, Ghy-19

1.0 A 'Single Stage two Envelopes' procedure will be adopted. Participants are to submit a single envelope containing both RFP for Technical specification of items as detailed in the specification and relevant experience in one envelope followed by another envelope containing Offer-Price proposal for the said work. In this single stage process consisting of two separate envelopes, first envelope consists of the technical proposal etc. which shall be opened first and second envelope shall consist of Price proposal. After short listing the suppliers/ Participants based on technical evaluation price-proposals of shortlisted Participants shall only be opened in accordance with the schedule as tabulated.

2.0 General Terms and Conditions:

- 2.1. The base prices should be exclusive of GST.
- 2.2. Corresponding GST should be shown separately.
- 2.3. Price proposal should be inclusive of F&I.
- 2.4. Authentic proof of experience of similar nature of work done earlier must be submitted.
- 2.5. The prescribed design and layout are to be done by the Participant at his own cost.
- 2.6. AEGCL reserves the right to cancel or reject/ accept any RFP without assigning any reason thereof.
- 2.7. No OEM/ Manufacturer shall submit more than one RFP.
- 2.8. Notwithstanding anything to the contrary contained in this RFP bid document, the detailed terms specified in the Work order/ Contract Agreement shall have overriding effect provided that any conditions or obligations imposed on the Participant hereunder shall continue to have effect in addition to its obligations under the Contract Agreement.
- 2.9. The RFP and all communications in relation to or concerning the bid documents and the preparation of RFP shall be solely in English language.
- 2.10. The bid document and all attached documents, provided by the Authority are and shall remain the property of the Authority and are transparent to the Participants solely for the purpose of preparation and the submission of their respective quotations in accordance herewith. Participants are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their proposals.
- 2.11. This RFP bid document is non-transferable.
- 2.12. **Earnest Money in the form of Bank Guarantee (BG)/FD/DD in favour of Assam Electricity Grid Corporation Limited (AEGCL) payable at Guwahati should reach this office (Office of the CGM, SLDC, Kahilipara, Ghy-19) latest by 2 hours before opening of the RFP.**
- 2.13. Performance Security of the Contract Value in form of Bank Guarantee (BG) shall be submitted to AEGCL by the successful Participant within 15 days from date of issue of Notification of Award (NOA) and before signing of the Contract Agreement. The same shall be valid for the warranty period or 18 (eighteen) months whichever is later starting from the date of signing of the Contract Agreement as per **Clause (Performance Security)**. **However, the existing Performance Security will be returned only after 30days expiration of the warranty period.**
- 2.14. AEGCL reserves the right to cancel/withdraw the RFP without assigning any reason & shall bear no liability whatsoever consequent upon such a decision.



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- 2.15. The price proposals of only those Participants, whose Techno-commercial proposals have been accepted to the requirements of the bid document, shall be considered for opening of Offer Price RFP (price proposal).
- 2.16. AEGCL shall not be responsible for any costs or expenses incurred on the preparation and submission of the RFP(s).
- 2.17. **AEGCL also reserves the right to reject the RFP proposals of Participant(s) whose offered price to AEGCL is not satisfactory.**
- 2.18. **AEGCL is not bound to accept the offer of Lowest (L1) Participant. The undersigned reserves the right to accept or reject any or all the RFPs without assigning any reason thereof.**
- 2.19. All the corrigendum/addendums will only be informed to the Participants directly through electronic means.
- 2.20. In the General Terms and Conditions of Supply and erection 2009, AEGCL, the supply here means supply of equipment and erection means installation and commissioning of equipment. All other terms and conditions as mentioned in the bid document and general conditions of AEGCL shall be followed accordingly.

3.0 Knowing the RFP bid document:

Every intending Participant is to examine and understand all instructions, forms, terms & conditions and specifications in the RFP bid document and fully make himself known to all the conditions and contents therein, which may in any manner, affect the scope & content of the work and the costs thereof. Submission of a proposal not substantially responsive to the RFP bid document in all respects and/or failure to furnish all information required by the RFP bid document may entail rejection of the proposal at the Participant's risk.

4.0 Clarifications on bid document:

A prospective Participant requiring any clarification of the bid document may notify AEGCL in writing/ email at the address indicated in the bid document. AEGCL will address those queries in writing through emails (CGM, SLDC, AEGCL, Kahilipara, Guwahati-19) and subsequently will issue explanations, interpretations and clarifications as deemed fit in writing as a response to this request. **(2 days prior to Pre-RFP meeting)**

The Pre-RFP meeting will be held as per the date mentioned in the Bid document. The bidder may also attend the Pre-RFP meeting through Video Conferencing mode. Link of which shall be uploaded in the e-tender portal as well as AEGCL website www.aegcl.co.in. To participate in the pre-RFP meeting through Video Conferencing, Bidders are requested to send the representative details (Name, Designation, Email ID, Phone) at samastcell.sldc@aegcl.co.in to facilitate participation in the Video Conferencing.

5.0 Submission and opening of bid documents:

The Participant shall submit the techno commercial & price RFP through **e-tendering portal <https://assamtenders.gov.in>** All documents as required by this Bidding document shall be scanned and uploaded in the portal. Price schedule should be submitted in the format provided in the online portal. Participant must go through the document checklist provided in this Bidding document and submit all required document. Participants are also requested to submit the information in the format provided in this Bidding document where applicable.

In addition to the online RFP submission, (i) Original copy of EMD, (ii) Duly filled and signed tender submission form and (iii) Authorization letter of RFP signatory must be submitted in a sealed envelope superscribed with the name of Participant, full address, IFB reference, name of work etc. at the office of the Managing Director, Assam Electricity Grid Corporation Ltd, Bijulee Bhawan, Paltan Bazar Guwahati-781001 one hour prior to RFP submission end date and time. In case these documents are not received, the RFP



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shall be summarily rejected.

6.0 Deadline for Submission of RFPs

RFPs shall be received ONLINE only on or before the date and time indicated in the NIT. The Purchaser may, at its discretion, extend the deadline for the submission of RFPs by amending the Bidding document, in which case all rights and obligations of the Purchaser and Participants previously subject to the deadline shall thereafter be subject to the deadline as extended.

7.0 RFP VALIDITY

The validity of RFP shall be for **180(One Hundred Eighty) days** from the date of RFP submission end date.

In exceptional circumstances, AEGCL may request the Participants for a specified extension of the period of validity of the RFPs and/or the Performance Guarantees and/ or Earnest Money Deposits. The Participants shall comply with such requests.

8.0 Withdrawal of RFP proposal:

No withdrawal of RFPs shall be allowed.

9.0 EARNEST MONEY

The RFP must be accompanied with earnest money as mentioned in the NIT against the works to be deposited

- a. in the form of Bank Guarantee (BG) of Nationalized or scheduled Bank
or
- b. in the form of FD/Term Deposit pledged in favour of "The Managing Director, AEGCL".
or
- c. Online through E-Tender portal.

The EMD should be submitted along with Techno-Commercial RFP and scanned copy of EMD is to be uploaded in the online portal. The earnest money will be released to the unsuccessful Participants on finalization of the tenders. The EMD to the successful Participant will be released on submission of Security Deposit after execution of the contract agreement.

EMD (in Rs.)INR 12,50,000/- only

10.0 Opening of RFP proposal

All the RFPs shall be opened ONLINE in presence of Participants or their authorized representatives at AEGCL's HQ and the evaluation process shall proceed thereafter as per **single stage two envelope process**.

RFP Format: Participants have to prepare their proposals in the formats furnished with this Document verbatim, without adding any printed/typewritten text of their own.

11.0 Local Conditions

It will be imperative on each Participant to be fully informed himself of all local conditions and factors which may have any effect on the execution of the Contract covered under this document and specifications. AEGCL shall not entertain any request for clarifications from the Participants, regarding such local conditions.

11.1 It must be understood and agreed that all such factors have properly been investigated and



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considered while submitting the RFPs. No claim for financial adjustment to the Contract awarded under these specifications and documents will be entertained by AEGCL. Neither any change in the time schedule of the Contract nor any financial adjustments arising thereof shall be permitted by AEGCL, which are based on the lack of such clear information or its effect on the cost of the Works to the Participant.

12.0 Documents comprising the RFP proposal:

- 12.1 The Participant shall complete the Schedules under Annexure-A, & B as furnished in this bid document.
- 12.2 The Participant shall also submit documentary evidence to establish that the Participant meets the Eligibility Requirements as detailed in **Evaluation of Eligibility Criteria**
- 12.3 All Documents/ formats are to be returned completed and filled in all respects and signed by the Company Authorized Signatory wherever specified for Bidding document.
- 12.4 The EMD shall be furnished in a cover separately from the envelope containing RFP (Technical & Financial) as per Clause No: 1.0 in accordance with **General Terms and Conditions of supply & erection 2009, AEGCL**

13.0 Details Scope of Work:

The scope of works are as follows:

Detailed Survey, preparation of drawings for installation of Energy Meters at existing available Metering Panels, find out the installation location (as applicable) of the Grid Substations for finding out the actual requirement of Networking H/W for TCPIP, including and find out the requirement of Cable & its laying out.

- 13.1 "Supply, installation, Testing & Commissioning of SAMAST compliant 0.2S CLASS ABT energy Meters on existing metering panel and integrated these meters with the network switches and the data should be available at Local PC for viewing & data downloading through BCS in the (68 No of Substations) of AEGCL.
- 13.2 "Supply, installation, Testing & Commissioning of SAMAST compliant 0.2S CLASS ABT energy Meters on existing panels, networking from meter to LAN switch in the new/upcoming GSS of AEGCL (02 Nos. of Substations) and the data should be available at Local PC for viewing & data downloading through BCS.
- 13.3 "Supply, installation, Testing & Commissioning of 0.5S CLASS LT Meters with ring CT in the existing LT panel of Grid substations of AEGCL and New/upcoming Grid Substations (70 nos.) and the data should be available at Local PC for viewing & data downloading through BCS as follows:-
- 13.4 Any other work which is not identified in Cl 13 or in the specification but is required for completion of the project within the intent of this specification shall also be in the scope of the bidder without any extra cost.



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14.0 Details of the project

S. No.	Items	Quantity
1	SAMAST Compliant Energy Meters	433 nos. 0.2S CLASS ABT Energy Meter at Existing and new/upcoming Grid Substations of AEGCL
2	LT Energy Meter with ring CT	70 Nos
3	Substations	68 nos. Existing Grid Substations and 02 Nos new/upcoming Grid substation.
4	Network Switch	70 (Lan Switch 8/16 Port, unmanaged 10/100/1000)
5	Lan cable (Cat-6)	20 Roll of 305 meters each (approx.)

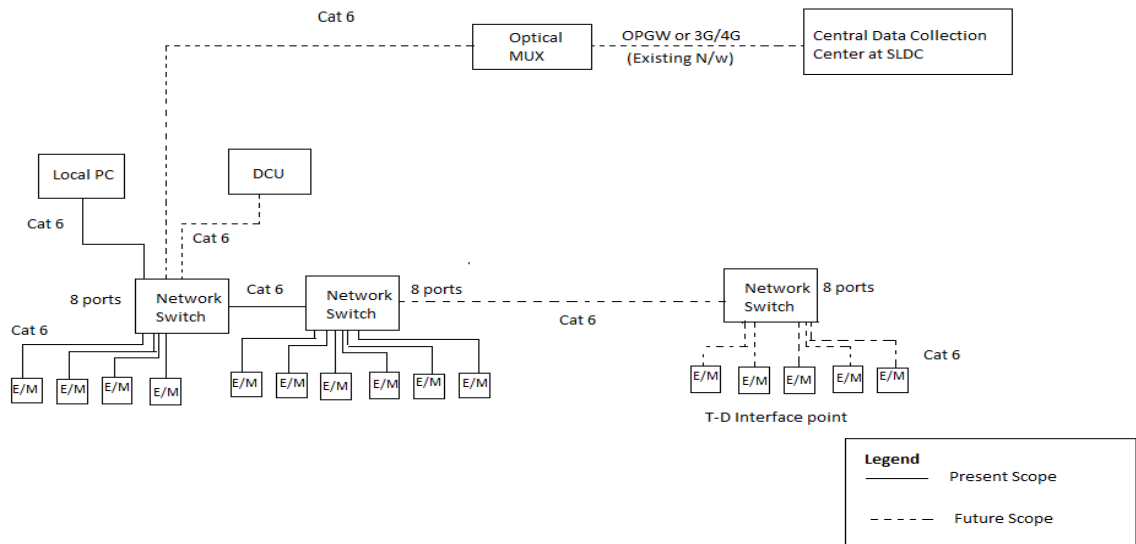
15.0 Scope of Activities

Considering the above-mentioned requirements, following activities are envisaged by AEGCL against the scope of work:

- 15.1 Supply, installation/replacement and commissioning of meters as per the specification attached in the tender. **(Annexure-A)**
- 15.2 Supply, installation and commissioning of network **switches** and other network devices at substations as per requirement.
- 15.3 Supply, installation and commissioning of LT meters with ring CTs for Station Auxiliary.
- 15.4 Cabling, Wiring, terminations and interconnections of the equipment.
- 15.5 Supply, installation and commissioning of hardware and software for BCS.
- 15.6 Integration with Local SAS/Metering PC at Substation for locally viewing and data downloading of energy meter data.

16.0 Deployment of architecture

- 16.1 Architecture to will deployed will be as per approved SAMAST architecture.





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Fig: SAMAST Architecture

17.0 Supply, installation and commissioning of meters at all substations

- 17.1 Conducting survey for all substations of different voltage levels (combinations of 220/132/66/33kV) which should include the no. of feeders viz. a viz meter and other hardware requirement in each substation, collecting the drawings of each substation, assessing the space available to install the hardware and communication setup at substation etc.
- 17.2 Supply of the meters shall be as per the specification and as attached with the tender document as **Annexure-A**.
- 17.3 Based on the actual survey, installation and commissioning of the meters shall be executed by Participant's team as per the standard installation practices.
- 17.4 Detailed specification of the required interface meters & LT meters are attached in **Annexure A**

18.0 Supply, installation and commissioning of BCS system for meter data collection

- 18.1 The intent of meter data collection (AMR/DAS) scheme proposed in this document is to automate the task of data collection from each meter/location to the local PC through BCS.
- 18.2 **Energy Meters:** Energy Meters to be covered under proposed system are manufactured as per Technical Specification attached with in **Annexure A**

19.0 Delivery plan:

- 19.1 Before the commissioning and final configurations, Participant's execution team shall share the inception report of the project which shall cover deployment architecture, flow of data acquisition process, integration techniques, dashboards and shall also discuss the expected changes in dashboards and reports so that customer specific reports can be created.
- 19.2 Participant's team shall work on customer specific requirements and perform factory acceptance (FAT) test then shall deploy the final solution field/site.
- 19.3 After commissioning, some identified users of utility team shall validate with the application module against the requirement captured which shall be considered as site acceptance test (SAT).
- 19.4 Project execution duration should be 12 months from the date of LOA till the handover and training activities.

20.0 Go-Live

- 20.1 Utility will consider Go-live of the project after completing following activities for all substations:
 - Supply, installation and commissioning of meters as per tender scope mutually agreed.
 - Configuration of reports and dashboards and deployment at site
 - Participant may take 2 months or as mutually agreed with the utility for stabilization of the project before Go-Live.



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- 20.2 Go-live/commissioning certificate will be issued to Participant for acceptance of the deployed system by utility/SLDC.
- 20.3 System handover after training to utility/SLDC team for further execution and maintenance.

21.0 Project Field Maintenance

- 21.1 All activities under project services shall go through change management. For those activities under project services, ARC (Additional Resource Charge) would apply for the same. The pricing shall be mutually discussed and shall be agreed upon case to case basis before initiating the activity.
- 21.2 Scope of this contract is limited to the equipment supplied against this contract only. Any new hardware / software supply & installation shall not be covered under this scope. For this, utility shall place purchase orders separately.
- 21.3 The contract is limited against any defect arising due to design and manufacturing defects. Any defect arising due to external operational fault or damage or natural calamity shall not be covered under this contract. This contract does not cover any defect in the product caused by accident, misuse, neglect, alteration, modification or substitution of any of the components or parts, or any attempt at internal adjustment by unauthorised service personnel, external faults or usage other than specified. Any defects / breakages observed out of the warranty period shall be attended on chargeable basis and the same shall be decided on mutually agreed terms & conditions.

22.0 Dependencies

- 22.1 The end user does not change /alter any hardware and software provided by Participant in the field at its own.
- 22.2 The performance and availability of the data from field devices and meters heavily depends on maintaining the healthiness of the allied hardware and connections by the end user in the field
- 22.3 The field problem resolution response shall depend on the cooperation by end user.
- 22.4 Dependency for Shutdown shall be on Utility.
- 22.5 To provide base data like CT/PT ratio, transformer capacity, substation details etc. shall be provided by utility only.

23.0 RFP participation:

The Participant's experience as sub-contractor in any contract shall not be taken into account in determining the Participant's compliance for meeting the mandatory eligibility, financial and technical evaluation criteria. Further, the Participant shall not be entitled to use sub-contractor's technical experience and financial capability for meeting the mandatory eligibility, financial and technical evaluation criteria.

24.0 Evaluation of Eligibility Criteria: (Technical and Financial)

The following is the RFP process/ evaluation methodology that will be adapted by purchaser for appointment of Agency.

25.0 Qualification Requirement:

- 25.1 The Participant should be a company registered under Company Act 1956 (amended in 2013) and in operation for at least 10 (ten) years as on the date of RFP opening and shall have their registered offices in India.



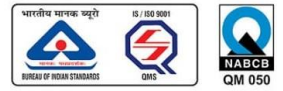
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Certificate of Incorporation needs to be submitted in this regard.

- 25.2 The Participant must have valid PAN No and GSTIN No.
Copy of PAN card and GSTIN Registration is required to be submitted with the RFP.
- 25.3 The Participant must have P.F/ESI Registration according to the Acts of Government /Labor Laws.
Necessary documentary proof in this respect should be attached with the RFP.
- 25.4 The Participant must not be banned or debarred or blacklisted by any State Govt. / Central Govt. / Central or State Govt. Undertakings / Utilities / Private Organizations etc. in the past.
Declaration in this regard by the authorized signatory of the Participant needs to be submitted.
- 25.5 The above stated requirements are a minimum and Utility reserves the right to request for any additional information and also reserves the right to reject the Proposal of any Participant, if in the opinion of utility, the qualification data is incomplete or the Participant is found not qualified to satisfactorily perform the Contract.
- 25.6 The Participant shall give the certification that the equipment supplied under this project shall not be obsolete till the end of AMC.
- 25.7 No Consortium/JV shall be allowed.

The Participant is required to furnish the following information/enclose self-attested photocopies of the following required documents along with the RFP, failing which their RFPs shall be rejected and will not be considered any further.

26.0 Table 1: Mandatory Eligibility Criteria

The following mentioned eligibility criteria are mandatory for the submission and the Participant is expected to submit the mentioned supporting documents.

Deliverable Compliance and Quality		
Qualification	Criteria	Supporting Documents
Company Registration	The Participant should be a company registered under Company Act 1956 (amended in 2013) and in operation for at least 10 (ten) years as on the date of RFP opening and shall have their registered offices in India	Copy of certificate of incorporation, GST registration and Permanent Account Number (PAN) to be enclosed with Technical RFP.
ISO 9001	The Participant must possess valid ISO 9001 certification for meter manufacturing	Authorized certification in this regard must be submitted
ISO/IEC27001	The Participant must possess valid ISO /IEC27001 certification	Authorized certification in this regard must be submitted
ISO 14001 and ISO 45001	The Participant must possess valid ISO 14001 for environmental and ISO 45001 certification for occupational Health & Safety Management (H&S).	Authorized certification in this regard must be submitted
CMMI level 3 or higher certificate	The Participant must possess valid CMMI level 3 or Higher Certificate	Authorized certification in this regard must be submitted

26.1 Table 2: Mandatory Financial Criteria



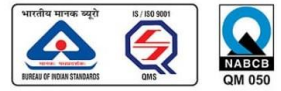
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The following mentioned financial criteria is mandatory for the submission and the Participant is expected to submit the mentioned supporting documents.

S.N.	Financial Requirements	Documents Needed
1	The Participant must have a positive net worth in each of the last Five (5) financial years (FY 2014-15 to FY 2018-19). Here, net worth means the sum total of the paid up capital and free reserves (excluding reserves created out or revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account for current year) and intangible assets.	<i>A certified document by a Chartered Accountant or audited balance sheet of last Five (5) financial years ending at the date of RFP opening needs to be submitted.</i>
2	Minimum Average Annual Turnover (MAAT) of Participant should not be less than one hundred (100) Crores for best 3(three) financial years out of past 5(five) financial years(FY 2014-15 to FY 2018-19)	<i>Audited balance sheet of Participant of last five (5) financial years ending at the date of RFP opening in support of above needs to be submitted.</i>

26.2 Table 3A: Technical Qualification Criteria for Participant

The following mentioned technical qualification criteria is mandatory for the submission and the Participant is expected to submit the mentioned supporting documents.

S. N	Eligibility criteria	Document evidence to be submitted
1	The Participant must have experience in supply, of 0.2s Class ABT energy meters of at least 200 numbers in the last six (6) years ending on the original date of RFP opening.	Work Order / Purchase Order / Contract Agreement and Go-live / Completion Certificate from the client
3	The Participant must have at least one NABL accredited Laboratory. They should have to upload notarized copy of NABL Accreditation Certificate	Documentary evidence should be provided along with the RFP
4	The Participant must possess bureau of Indian Standard Certification (ISI mark) for meter manufactured in India.	Documentary evidence should be provided along with the RFP

28.3 Table 3B: Technical Qualification Criteria for Participant : AMR

The following mentioned technical qualification criteria is mandatory for the submission and the Participant is expected to submit the mentioned supporting documents.

S. N	Eligibility criteria	Document evidence to be submitted
1	The Participant must have experience in one project with telemetry at least twenty (20) Sub-stations in the last five (5) years ending on the original date of RFP opening. Which should include installation and commissioning of Energy meters, RTU/ FRTU/ DCU and Transmission of telemetered data to a control centre. OR The Participant must have experience where more than 50 number of DCU supplied for data acquisition in the last six (6) years ending on the original date of RFP opening	Work Order / Purchase Order / Contract Agreement and Go-live / Completion Certificate from the client

The Participant needs to submit work plan and manpower deployment plan in the technical proposal.



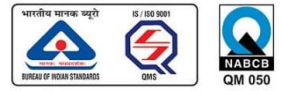
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28.4 Participant's Manpower requirement:

The following mentioned Manpower qualification criteria is required by the Participant. Supporting documents should be provided along with the RFP

S.N	Position	Count	Minimum Qualification	Minimum Work Experience
1	Project Manager	1	B.E. /B.Tech	15 (Fifteen) years of experience in Power sector
2	Team Lead - Meter	1	B.E. /B.Tech	10 (ten) years of experience in IT / Power sector with minimum 5 (Eight) years of experience in Supply, installation and commissioning of meters.
3		1	B.E. /B.Tech	8 (Eight) years of experience in IT / Power sector with minimum 5 (five) years of experience in Substation projects or AMR projects
4	AMR expert	6	B.E./B.Tech/ Diploma	5 (Five) years of experience in AMR projects.

27.0 Financial Evaluation Criteria

- 27.1 The financial RFPs of only technically qualified Participants will be opened for further processing.
- 27.2 The evaluation will be based on the net lump-sum charges exclusive of any taxes, duties, fees, levies and other charges quoted by Participants in the financial proposals.
- 27.3 All applicable taxes, duties, fees, levies and other charges shall be paid to the successful Participant on actual basis.
- 27.4 Price Negotiation with Bidder: Subsequent to tender evaluation, if at all deemed necessary the Evaluation committee constituted by AEGCL may engage in price Negotiation with the successful bidder.

28.0 Award of Contract:

- 28.1 The RFP shall be awarded to the Successful Participant whose proposal has been determined to be substantially responsive and subject to meeting all the conditions complying to the RFP bid document. The Participants must qualify the techno-commercial parameters to be eligible for Price Bidding document.
- 28.2 Those qualified Participant's commercial/ price RFP shall be opened in the next process i.e., price RFP process whose evaluation shall be the deciding factor for 'Award of contract' to the Successful Participant for accepting its proposal.

29.0 Notification of Award and Signing of Contract

- 29.1 AEGCL will notify in writing to the Successful Participant through a Notification of Award and this Notification of award shall have to be accepted within 15 (Fifteen) days from the date of issue of the same.
- 29.2 If the Notification of Award (NoA) is not accepted within stipulated time period i.e., 15 days; AEGCL has the right to cancel L1 Participant (successful Participant) and negotiate with the second lowest Participant.
- 29.3 Upon acceptance of this Notification of Award within 15 days, the successful Supplier shall be required



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to submit **Performance security** before entering into a contract agreement with AEGCL and payment shall be made against the Supply, Erection and maintenance of the said work as per **Payment Schedule**.

30.0 Payment Schedule: The payment shall be made as hereunder:

30.1 Payment against Goods and F&I (Price Schedule 1& 1A) shall be made as follows: -

A. Progressive Payments for supply items:

1. Within 60 (sixty) days from the date of submission of the invoice against supply, 60% (sixty percent) payment of the total supply amount would be made along with 100% GST on receipt and acceptance of materials in full and good condition.
2. In total, 10 (ten) Nos. of progressive supply invoices would be entertained.
3. For payment of 60% (sixty percent) of total supply amount, maximum 6 (Six) Nos of progressive supply invoices would be entertained
4. Remaining 4(four) Nos of supply invoices would be entertained on fulfilment of the following conditions
 - a) 50% of balance supply amount would be paid on completion of 50% of the total erection works or on proportionate basis, of the project.
 - b) Remaining 50% of the supply amount would be paid on completion of 100% erection, testing and commissioning activities of the project.

30.2 Payment against Installation and other services (Price Schedule 2) shall be made as follows:

B. Progressive Payments for erection works:

1. In total 5 (five) Nos. of progressive erection invoice/ bill would be entertained.
2. The 1st progressive erection invoice/ bill would be entertained on completion of 20% of total erection cost of the project.
3. Thereafter, progressive erection invoice/ bill can be submitted on completion of 10% of the subsequent erection work and payment will be made on proportionate basis. However, the total amount paid vide all progressive payment should not be greater than 90% of the total value of the Erection works.
4. Remaining 10% of the erection value would be paid on completion of 100% erection, testing and Commissioning activities of the project.

33.0 Documents to be submitted with the invoice (For Turnkey Contract)

Payment of invoice would be entertained subject to submission of the following documents with the invoice –

- 33.1 Unconditional acceptance of the Letter of Award and signed Contract Agreement, by the contractor for supply.
- 33.2 Detailed Supply Plan approved by the AEGCL.
- 33.3 Documentary evidence of dispatch (R/R or receipt of L/R).
- 33.4 Contractor's detailed invoice & packing list identifying contents of each shipment/supply.
- 33.5 Copy of certificate in respect of payments of State/ Central taxes, duties, levies, etc. have been made against supply of equipment/ materials through contractors/ sub-vendors under the contract, if applicable.
- 33.6 Certified copy of Insurance Policy/ Insurance Certificate.
- 33.7 Manufacturer's/ Contractor's Guarantee Certificate of Quality.



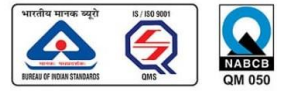
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- 33.8** Material Dispatch Clearance Certificate (MDCC)/ Dispatch Instructions (DI) for dispatch of materials from the manufacturer's works. MDCC/DI shall be issued by authorized Officer of AEGCL.
- 33.9** Manufacturer's/ Supplier's copy of challan.
- 33.10** Copy of testing/ inspection of equipment/ material clearance certificate issued by AEGCL.
- 33.11** Copy of Goods Receipt Sheet (GRS)/ Materials Received Voucher (MRV)/ Materials Handing Over Voucher (MHOV).
- 33.12** Joint Measurement Certificate (For erection)
- 33.13** Labour License, Insurance, etc.- (for erection only)
- 33.14** Payments would be made subject to fulfilment of the following conditions
- i. Advance copy of invoices in duplicate with documents/ information as stated under clause (a) to (m) are to be furnished sufficiently in advance.
 - ii. Any demurrage charges on account of late intimation and/or delivery of documents by the Bank is to be borne by the supplier. The supplier should intimate the dispatch of each and every consignment to the Purchaser and the Consignee. All Bank charges are to be borne by the supplier.
 - iii. Payment through Bank for supply of equipment/ materials, dispatched by Rail would be allowed if required, however the equipment/ materials have to reach at destination/ project site in full and good condition and additional expenditure in any form for this is to be borne by the supplier.
 - iv. A prior approval from appropriate authority of the AEGCL is to be taken in this respect.
 - v. Payment through Bank for supply of equipment/ materials, dispatched by road transport would be allowed if required, provided that, the transport agency is approved by the Banking Association and prior approval thereof is given by the AEGCL's appropriate authority.

34.0 ADVANCE PAYMENT

No advance payment is applicable for this contract.

35.0 PERFORMANCE SECURITY DEPOSIT

- 35.1** The Supplier shall have to deposit to the extent of 10% (ten percent) of the total value of the order as performance security (Bank Guarantee), within Fifteen (15) days of receipt of notification of award, duly pledged in favor of the Purchaser and such security deposits shall be valid up to 60 days beyond the warranty period.
- 35.2** If required, the supplier on his own has to renew the BG at least 1(one) month before the date of expiry of the BG; failing which the BG shall be revoked by AEGCL within the claim period without any prior intimation to the contractor
- 35.3** If the Supplier fails or neglects to observe, perform any of his obligations under the contract, it will be lawful for the "Purchaser" to forfeit either in full or in part at his absolute discretion, the security deposit furnished by the supplier.
- 35.4** No interest shall be payable on such deposits.

36 WARRANTY



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- 36.1 The Supplier/Manufacturer warrants that all the Goods are 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
- 36.2 The Supplier/Manufacturer further warrants that the Goods along with the associated software shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination
- 36.4 The warranty shall remain valid for a period of **sixty (60) months from the date of supply** (the Goods having been delivered to and accepted at the final destination indicated in the Purchaser's Requirement) If during the Period of Warranty, any defect should be found, the Purchaser shall give Notice to the Supplier/Manufacturer stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier/Manufacturer to inspect such defects.
- 36.5 If having been notified, the Supplier/Manufacturer fails to remedy the defect within a period of 15 (fifteen) days, the Purchaser may, following notice to the Supplier/Manufacturer, proceed to do such work, and the reasonable costs incurred by the Purchaser in connection therewith shall be paid to the Purchaser by the Supplier or may be deducted by the Purchaser from any monies due the Supplier or claimed under the Performance Security.
- 36.5 The warranty shall cover Goods along with the associated software.

37 Completion:

The entire supply and erection works shall be completed within **12 months** from the Contract commencement Date. Necessary Road Permit for transportation shall be arranged by supplier. However, AEGCL shall extend possible assistance for the same.

38 COPY RIGHT ETC

- 38.1 The Supplier shall indemnify the purchaser against all claims actions, suits and proceedings for the infringement or alleged infringement of any patent, design or copyright protected either in the country of origin or in India by the use of any equipment supplied by the Supplier but such indemnity shall not cost any use of the equipment other than for the purposes indicated by or reasonably to be inferred from the specification.

39 QUANTITY VARIATION

"Purchaser" shall have the right to increase/decrease the ordered quantity by 20% within 50 days of the period of completion and the same shall be carried out at the same rates /prices and terms and conditions stipulated in the order except in regard to completion schedule, which shall be mutually agreed upon in case of enhancement of the ordered quantity.

40 INSPECTION AND TESTING

- 40.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services.



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- 40.2 The inspections and tests may generally be conducted on the premises of the Supplier/Manufacture, at point of delivery. The Supplier shall furnish all reasonable facilities and assistance, including access to drawings and production data to the inspectors at no charge to the Purchaser.
- 40.3 The Purchaser or its designated representative shall be entitled to attend the tests, provided that the Purchaser bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all travelling and board and lodging expenses.
- 40.4 Whenever the Supplier is ready to carry out any such test and/or inspection, the Supplier shall give a reasonable advance notice (not less than 30 days) of such test and/or inspection and of the place and time thereof to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.
- 40.5 The Supplier/manufacture shall provide the Purchaser with a certified report of the results of any such test and/or inspection.
- 40.6 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to sub-clause 34.4.
- 40.7 If it is agreed between the Purchaser and the Supplier that the Purchaser shall not attend the test and/or inspection, then the Supplier may proceed with the test and/or inspection, and should provide the Purchaser with a certified report of the results thereof.

41.0 INSURANCE

- 41.1 The "Supplier" shall, have, unless, otherwise specified by the Purchaser, insure the materials through their underwrites at their cost and shall keep it insured against any loss/ damaged/ pilferage in transit, destruction or damage by fire/ flood, without exposure to vagaries of weather or through riot, civil commotion, war or rebellion, for the full value of the materials until the materials are received at the purchaser's destination store.
- 41.2 The "Supplier" shall be responsible for safe arrival at destination, unloading and receipt of the materials by the consignee. The Purchaser will discharge consignee's responsibilities only and shall not be responsible for any damage/ loss/ pilferage/ non-delivery by the carriers.
- 41.3 In case of any loss/ damage/ pilferage/ non-delivery/ short delivery by carriers etc.; the Supplier shall replace free of cost missing / damaged / lost materials within 30(thirty) days from the receipt of report thereof from the consignee(s) without waiting for settlement of their claims with their carriers / under-writers. Normally, such reports from the consignee(s) to the supplier shall be initiated within a period of 30(thirty) days from the date of receipt of each consignment by him /them.
- 41.4 If it is considered necessary that the damage equipment either in part or in full to be sent back to the manufacturer's works for repair, the manufacturers/ suppliers will furnish the Bank Guarantee for the full value of equipment needing repairs and such Bank Guarantee shall remain valid till such time, the equipment are repaired and returned to the consignee in good condition. The to and fro freight, handling and insurance charges in such cases will be borne by the Supplier.
- 41.5 Unless, otherwise mutually agreed upon, in case of failure by the Supplier to replenish /make good of the loss /damage /short supplied quantities, within the stipulated period, the Purchaser reserves the right to



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forfeit the security deposit and/ or adjust any outstanding payment to the “Supplier” with the Purchaser or take any other appropriate action.

42 FORCE MAJEURE

- 42.1 “Force Majeure” shall mean any event beyond the reasonable control of the Purchaser or of the Supplier, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:
- (a) War, hostilities or warlike operations whether a state of war be declared or not, invasion, act of foreign enemy and civil war
 - (b) Rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts
 - (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority
 - (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague
 - (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster
 - (f) shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure.
- 42.2 If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.
- 42.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party’s performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with relevant Clause.

43 EXTENSION OF TIME FOR COMPLETION

- 43.1 The Time(s) for Completion specified in the **clause no: 37** of the Contract Agreement (Contract Forms) shall be extended if the Supplier is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:
- (a) any Change in the scope of works by the Purchaser; which justifies extension of completion time and
 - (b) any occurrence of Force Majeure as provided in **Clause 42**.
- 43.2 Except where otherwise specifically provided in the Contract, the Supplier shall submit to the Purchaser’s Representative a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Purchaser and the Supplier shall agree upon the period



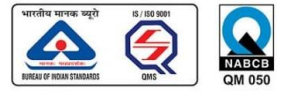
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of such extension. In the event that the Supplier does not accept the Purchaser's estimate of a fair and reasonable time extension, the Supplier shall be entitled to refer the matter to a Dispute Board.

44 LIQUIDATED DAMAGE

44.1 The Supplier guarantees that it shall attain Completion of the Works within the Time for Completion specified in the Contract Agreement, or within such extended time to which the Supplier shall be entitled under **Clause 26 of General Conditions of Supply & Erection of AEGCL** hereof.

44.2 If the Supplier fails to attain Completion of the Works within the Time for Completion or any extension thereof, the Supplier shall pay to the Purchaser liquidated damages at the rate of **1 % (One percent)** of the total Contract Price per week or part thereof delay. The aggregate amount of such liquidated damages shall in no event exceed **10% (ten percent)** of the total contract price.

However, the payment of liquidated damages shall not in any way relieve the Supplier from any of its obligations to complete the Works or from any other obligations and liabilities of the Supplier under the Contract.

44.3 Once the aggregated "Liquidated damage" reaches 10% of the total contract price, the Purchaser may consider following actions:

- (a) Procure the undelivered material/ equipment and/or complete the balance works from elsewhere giving notice to the supplier and to recover any extra expenditure incurred thereby for having to procure these materials and works at higher price, at the risk and responsibility of the Supplier; or
- (b) Cancel the contract wholly or in part and to complete the works at the full risk and cost of the Supplier and forfeit the security deposit.
- (c) Declare it as a "Contractual Failure" and act in accordance with **Clause 45 .0**.

45 CONTRACTUAL FAILURE

In the event of contractual failure of any respect on the part of the Supplier, the Purchaser shall be entitled to operate security deposit or any deposit or any payment due to supplier irrespective of whether his default relates to the particular orders or not towards the Purchaser's claim for damages arising out of the failure. In addition, the Purchaser may black-list or bans the "Supplier" or pending enquiry, suspend him or take any other steps considered suitable.

46 ARBITRATION

46.1 If at any time, any question, disputes or differences whatsoever shall rise between the Purchaser and the Supplier, upon or in relation to or in connection with the contract, either party may forthwith give notice to the other in writing of the existence of such question of dispute or difference and the same shall be referred to the adjudication of three Arbitrators, one to be nominated by the Purchaser the other by the Supplier and the third by the President of the Institution of Engineers, India/ Retired or Sitting Judge not below the status of a retired Judge of High Court of India. If either of the parties fail to appoint its arbitrators within 60(sixty) days after receipt of notice of the appointment of arbitrators then the President of the Institution of Engineers /retired or sitting Judge of India, as the case may be, shall have the power at request of either of the parties, to appoint an Arbitrator. A certified copy of the "President" making such an appointment shall be furnished to both parties



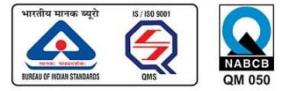
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46.2 The arbitration shall be conducted as per provisions of the Indian Arbitration Act, shall be held at Guwahati or any other place as may be decided by the Purchaser. The decision of the majority of Arbitrators shall be final & binding upon the parties and the expenses of the arbitration shall be paid as may be determined by the Arbitrator. However, any dispute arising out of this contract will first be discussed and settled bilaterally between Purchaser and the Supplier.

47 SYSTEM SECURITY & CYBER SECURITY:

The contractor shall document and implement a Cyber Security Policy in line with CERT-In latest guidelines (<http://www.cert-in.org.in>) to secure the system and the Contractor shall keep updating the Security settings as per the revised guidelines of CERT-In at time to time. All communicable devices are to be tested in accordance with the latest cyber security guidelines vide No: CEA-CH-13-12/4/2021-IT division.

Contract Forms

(This Section contains the Letter of Acceptance, the Contract Agreement and Appendices to the Contract Agreement which, once completed, will form the Contract along with the Section 4 and Section 5. The Participant should note that this Section shall be completed fully at the time of Contract signing)

Notification of Award

[AEGCL's letter head]

Letter of Acceptance



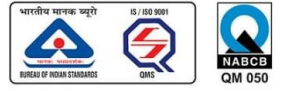
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Supply of Goods and Related Services

Date:

To: [Name and address of the Supplier]

This is to notify you that your RFP dated [date] for execution of the [name of the Contract and identification number, as given in the Contract Data] for the Contract Price in the aggregate of [amounts in numbers and words] [name of currency] (as per Price Schedule-1), as corrected and modified in accordance with the Instructions to Participants is hereby accepted, and it is decided to award on you the 'Supply and Delivery Contract' covering inter-alia Ex-works supply and Delivery of all Goods including Related Services.

You are requested to furnish the Performance Security within fifteen (15) days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section 8 (Contract Forms) of the Bidding document

[Authorized Signature]

[Name and Title of Signatory]

Assam Electricity Grid Corporation Limited



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Form of Performance Security

Bank Guarantee

(To be stamped in accordance with Stamp Act)

To: _____ [name of Purchaser]
_____ [address of Purchaser]

WHEREAS _____ [name and address of Supplier/Manufacturer] has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ [name of Supplier/Manufacturer and brief description of Scope] (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier/Manufacturer shall furnish you with a Bank Guarantee by a recognized/scheduled bank for the sum specified therein as security for compliance with its obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Supplier/Manufacturer such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Supplier/Manufacturer, up to a total of _____ [amount of Guarantee]' _____ [in words], such sum being payable in the currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Supplier/Manufacturer before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the scope to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the date, 30 days beyond the Warranty Period as per the Contract.

Signature and Seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____



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Annexure A

TECHNICAL SPECIFICATIONS & DELIVERY SCHEDULE

Schedule A

Specification for SAMAST Compliant Interface Energy Meter (IEM)

1. Interface Energy Meters Technical Specification

The specification covers the design, engineering, manufacturing, assembly and testing of static/electronic Interface Energy Meters) compliant Tri-vector type, Four Quadrant, Bi-Directional Energy Meter, suitable for 3-ph 4wire connections solidly earthed system with balanced and un-balanced loads for a power factor range from zero to unity (lagging & leading), with initial and sustained accuracy of class 0.2s. The energy metering system specified herein shall be used for tariff metering for bulk, inter-utility power flows. Projection mounted type, static composite meter shall be installed for EHV/HV circuit, as a self-contained device for measurement of active energy transmittals in each successive 15 minute or 5 minute block etc. meeting the ABT requirements. These meters shall be integrated in SAMAST framework as an when it goes live so the meter shall comply to SAMAST guidelines. The meter shall also be compatible for integration with SAS system. Necessary isolation and /or suppression shall also be built-in for protecting the meter from surges, voltage spikes, fault-current etc. that occurs in VT and CT circuits of extra high voltage switchyards.

2. Basic Features of Interface Energy Meters

- a) The energy metering system specified herein shall be used for tariff metering for bulk, inter-utility power flows, in different States of India. Static composite meter shall be installed at interface points as a self-contained device for measurement of Voltage (V), Frequency (f), Active (Wh) and Reactive (VARh) energy exchanged in each successive 5 min time block. All meters shall be compliant to IS 15959 and its latest amendments.
- b) Each meter shall have a unique identification code, which shall be marked permanently on its front, as well as in its memory. All meters supplied to as per this specification shall have their identification code starting with "IEM", which shall not be used for any other supplies. "IEM" shall be an eight-digit running serial number, further followed by "A" and "B" for the use with CT secondary of 1A and 5A respectively. This shall be mutually agreed between the buyer and the vendor.
- c) The meters shall be suitable for communication with external device like modem, DCU, etc. which shall be able to communicate with CDCS for local/remote data transfer. The meter shall compulsorily have at least 1 optical port for taking reading through Hand Held Unit (HHU).
- d) Auxiliary Supply to IEM- The meters shall normally operate with the power drawn from DC auxiliary power supply (Range 110V to 220V DC) to reduce the Voltage Transformer (VT) burden. In addition, there shall be provision to operate the meter from the Voltage Transformer (VT) secondary circuit having a rated secondary line-to-line voltage of 110V, and current transformers (CTs) having a rated secondary current of 1 A or 5A. Any further transformers/ transactions/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that



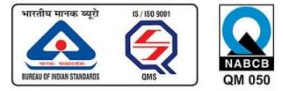
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Regd. Office:(FIRST FLOOR), BIJULEE BHAWAN, PALTANBAZAR; GUWAHATI - 781001

CIN: U40101AS2003SGC007238GSTIN: 18AAFCA4973J9Z3

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- occur in the VT and CT circuits of extra high voltage switchyards. The reference frequency shall be 50Hz. Also, the meter shall have suitable tolerance (up to 15% either side) for DC supply.
- e) The meters shall safely withstand the usual fluctuations arising during faults etc. In particular, VT secondary voltages 115% of V_{ref} applied continuously and 190% of V_{ref} for 3.0 seconds, and CT secondary current 150% of I_{ref} applied continuously and 30 times of I_{ref} applied for 0.5 seconds shall not cause any damage to or maloperation of the meters.
 - f) The meters shall continue to function for the remaining healthy phase(s), in case one or two phases of VT supply fails. In case of a complete VT supply failure, the computation of average frequency shall be done only for the period during which the VT supply was available in the 5-minute block. Any time block contraction or elongation for clock correction shall also be duly accounted for.
 - g) The total burden imposed by a meter for measurement and operation shall be defined as per IS 14697. An automatic backup for continued operation of the meter's calendar-clock, and for retaining all data stored in its memory, shall be provided through a long-life battery, which shall be capable of supplying the required power for at least 2 years. The meters shall be supplied duly fitted with the batteries, which shall not require to be changed for at least 10 years, as long as total VT supply interruption does not exceed two years. The battery mounting shall be designed to facilitate easy battery replacement without affecting PCB of the meter.
 - h) The meters shall fully comply with all stipulations in IS 14697 except those specifically modified by this specification. The reference ambient temperature shall be 27 °C.
 - i) Each meter shall have a test output device (visual), as per clause 6.11 of IS 14697.1999, for checking the accuracy of active energy (Wh) measurement. The preferred pulsing rate is twenty (20) per Wh for CT sec-1A and four (4) per Wh for CT sec -5A. It shall be possible to couple this device to suitable testing equipment also.
 - j) Exception Management- The three line-to-neutral voltage shall be continuously monitored and in case any of these falls below defined threshold (70% of V_{ref}), meter shall have suitable indication on LED/ LCD. The meter shall also have provision for low voltage event logging in meter memory in case of any phase voltage going below a defined threshold. The time blocks in which such a voltage failure occurs/persists shall also be recorded in the meter's memory with a symbol "*" if 3 Phase RMS voltage applied to the IEM is in between 5% to 70% of V_{ref} and if Voltage is less than 5% of V_{ref} , meter should record Zero voltage symbol "Z".
 - k) Time Accuracy - Each meter shall have a built-in calendar and clock, having an accuracy of 10 seconds per month or better. The calendar and clock shall be correctly set at the manufacturer's works. The date (year-month-day) and time (hour-min.-sec.) shall be displayed on the meter front on demand. Meter shall have the intelligence to synchronize the time with GPS (Local GPS/CDCS GPS/ NAVIC) signal and from PC using software. Limited time synchronization through meter communication port shall be possible at site. When an advance or retard command is given, twelve subsequent time blocks shall be contracted or elongated by five seconds each. All clock corrections shall be registered in the meter's memory and suitably shown on print out of collected data.
 - l) A touch key or push button shall be provided on the meter front for switching on the display and for changing from one indication to the next. The display shall switch off automatically about one minute after the last operation of touch key/push button. When the display is switched on, the parameter last displayed shall be displayed again, duly updated.



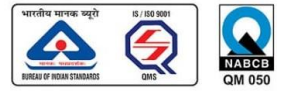
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- m) The whole system shall be such as to provide a print out (both from the local PC, and from remote central computer) of the following format:

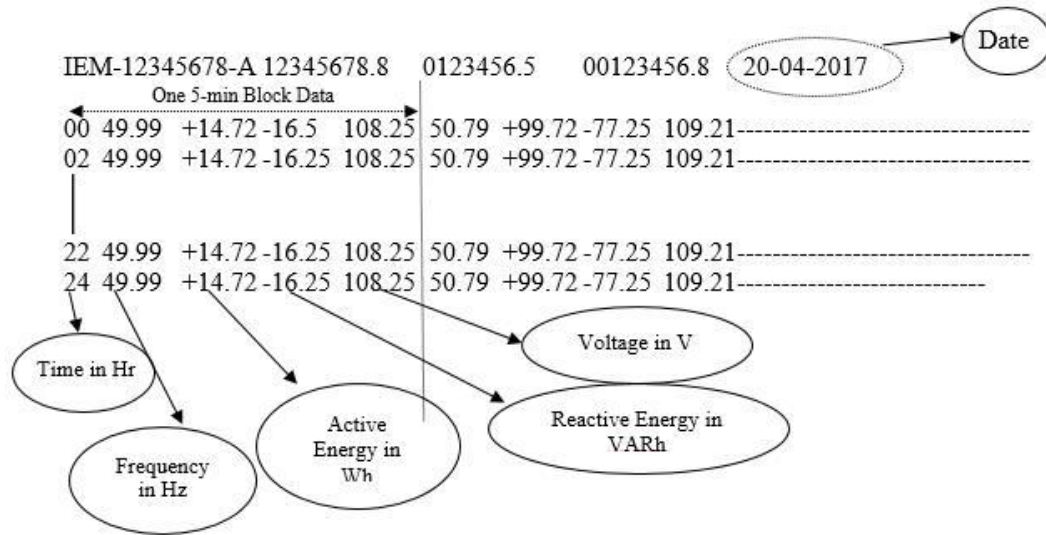


Figure 1: Standard Raw Data Format for IEM

There are 4 values in one 5 min time block. The first row shall contain the meter data for 2 hours, i.e., 24-time blocks, 00 hrs to 02:00 hrs. Similarly, the 2nd row shall contain the data for the next 2 hours and henceforth.

The above data shall be available in text file format (file extension as per IEEE standard/ .txt) exportable to Excel. Indication of time retard or advance to be provided without disturbing the proposed format. Each 5-min block data consists of Frequency (in HZ), Active energy (in Wh), Reactive energy (in VARh) and Voltage (in V). All 5-minute Wh and VARh figures in. NPC/output report shall be rounded off upto third decimal.

- n) The portable Hand-Held unit (HHU)/ Common meter reading instrument (CMRI)/ Data Collecting Device (DCD) shall be having IS-15959:2011 compatibility for standardized parameters. The optical coupler for tapping data stored in the SEMs memory shall be compatible universally across different make of SEMs.

o) Constructional Features

- The meters shall be supplied housed in compact and sturdy, metallic or moulded cases of non-rusting construction and/or finish. The cases shall be designed for simple mounting on a plane, vertical surface such as a control/relay panel front. All terminals for CT and VT connections shall be arranged in a row along the meter’s lower side. Terminals shall have a suitable construction with barriers and cover, to provide a secure and safe connection of CTs and VTs leads through stranded copper conductors of 2.5 sq. mm. size.
- All meters of the same model shall be totally identical in all respects except for their unique identification codes. They shall also be properly sealed and tamper evident, with no possibility of any adjustment at site, except for transactions allowed in IS 15959.



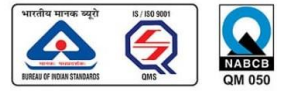
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- The meters shall safely withstand, without any damage or mal operation, reasonable mechanical shocks, earthquake forces, ambient temperature variations, relative humidity etc. in accordance with IS-14697. They shall have an IP-51 category dust-tight construction, and shall be capable of satisfactory operation in an indoor, non-air-conditioned installation.
- Either the meters shall have built-in facility (e.g., test links in their terminals) for in-situ testing, or a separate test block shall be provided for each meter.

3. Measurement

- a) The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class **0.2S** (IS 14697).
- b) The meter shall compute the net active energy (Wh) sent out from the substation bus bars during each successive 5 min block, and store it in its memory up to fourth decimal with plus sign if there is net Wh export and with a minus sign if there is net Wh import. Further Wh data in NPC/output report shall be rounded upto third decimal.
- c) The meter shall count the number of cycles in VT output during each successive 5 min block, and divide the same by 300 (60 sec/min x 5min) to arrive at the average frequency. The frequency data shall be stored in the meter's memory in Hertz up to third decimal. Further Frequency data in NPC/output report shall be rounded off upto second decimal.
- d) The meter shall continuously compute the average of the RMS values of the three line-to-neutral VT secondary voltages as a percentage of 63.51 V, and display the same on demand. The accuracy of the voltage measurement/computation shall be at least 0.5%, a better accuracy such as 0.2% in the 95-105% range being desirable. The voltage data shall be stored in the meter's memory in volts up to third decimal. Further voltage data in NPC/output report shall be rounded off upto second decimal.
- e) The Reactive energy (VARh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy of 0.5S as specified in IS 14697. The meter shall compute the net Reactive energy (VARh) sent out from the substation bus bars during each successive 5 min block, and store it in its memory up to fourth decimal with plus sign if there is net VARh export and with a minus sign if there is net VARh import. It shall also display on demand the net VARh sent out during the previous 5 min block. Further VARh data in NPC/output report shall be rounded off upto third decimal.
- f) The meter shall also integrate the reactive energy (VARh) algebraically into two separate registers, one for the period for which the average RMS voltage is above 103.0%, and the other for the period for which the average RMS voltage is below 97.0 %. The current reactive power (VAR), with a minus sign if negative, and cumulative reactive energy (VARh) readings of the two registers (>103% and <97%) shall be displayed on demand. The readings of the two registers at each midnight shall also be stored in the meter's memory. When reactive power is being sent out from substation bus bars, VAR display shall have a plus sign or no sign and VARh registers shall move forward. When reactive power flow is in the reverse direction, VAR display shall have negative sign and VARh registers shall move backwards. Generally, the standard PT ratios are 220 kV / 110 V, 400 kV / 110 V and 765 kV / 110 V. However, at the time of commissioning the vendor may confirm the same from site and configure the meter accordingly to ensure correct recording of reactive energy.



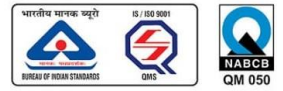
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- g) For CT secondary rating of 5A, all computations, displays and memory storage shall be similar except that all figures shall be one fifth of the actual, worked out from CT and VT secondary quantities.
- h) Further, the meter shall continuously integrate and display on demand the net cumulative active energy sent out from the substation bus bars up to that time. The cumulative Wh reading at each midnight shall be stored in the meter's memory. The register shall move backwards when active power flows back to substation bus bars.
- i) Errors for different power factors shall be as defined in IS14697.
- j) For reactive power (VAR) and reactive energy (VARh) measurements, IS14697 shall be complied with. The accuracy of measurement of reactive energy shall be as per class 0.5S.
- k) The harmonics shall be filtered out while measuring Wh, V and VARh, and only fundamental frequency quantities shall be measured/computed.
- l) Data security shall be ensured as per IS 15959 (three layers of security).

4. Memory/ Storage

Each meter shall have a non-volatile memory in which the following shall be automatically stored:

- i.** Average frequency for each successive 5 min block, in Hertz up to third decimals.
- ii.** Net Wh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net Wh export and with a minus sign if there is net Wh import.
- iii.** Net VARh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net VARh export and with a minus sign if there is net MVARh import.
- iv.** Cumulative Wh transmittal at each midnight, in eight digits including one decimal.
- v.** Cumulative VARh transmittal for voltage high condition, at each midnight in eight digits including one decimal.
- vi.** Cumulative VARh transmittal for voltage low condition, at each midnight, in eight digits including one decimal.
- vii.** Average RMS voltage for each successive 5min block.
- viii.** Date and time blocks of failure of VT supply on any phase, as a star (*)/ (Z) mark.
- ix.** The meters shall store all the above listed data in their memories for a period of fifteen (15) days. The data older than fifteen (15) days shall be erased automatically
- x.** The software provided at CDSCS, i.e., SLDC, will manage all functionalities of collection of data through DCUs, validate the data, store the data in a database, and manage the complete system. Software will also have a scheduler for scheduling the task of collection of data periodically. The periodicity of data collection shall be user defined.

5. Display

Each meter shall have digital display for indication of the following (one at a time), on demand:

- i.** Meter serial no. and model: IEM12345678A or IEM12345678B
- ii.** Date (year month day /yyyy mm dd): 20160311 d



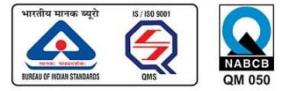
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- iii. Time (hour min sec /hh mm ss): 195527 t
- iv. Cumulative Wh reading: 1234567.8 C
- v. Average frequency of the previous block: 49.89 F
- vi. Net Wh transmittal during the previous block: - 28.75 E
- vii. Net VARh transmittal during the previous block: - 18.75 R
- viii. Average % Voltage: 99.2 U
- ix. Reactive power (VAR): 106.5 r
- x. Voltage - high VARh register reading: 1234567.5 H
- xi. Voltage - low VARh register reading: 1234567.4 L
- xii. Low battery indication
- xiii. The three line-to-neutral voltages shall be continuously monitored and in case any of these falls below 70 %, a preferably flashing three LEDs (one LED/phase) provided on meter's front shall become steady. They shall go off if all three voltages fall below 70 %. The LED shall automatically resume flashing when all VT secondary voltages are healthy again.
- xiv. The two VARh registers (xv and xvi) shall remain stay-put while VT supply is unhealthy.

Any other better or more informative mechanism to display the above shall be preferred. The above shall be mutually agreed between the meter buyer and vendor.

Navigation keys to be provided at the meter front plate to navigate the display menu.

6. Communication

- a) Each meter must have an optical port on its front for tapping all data stored in its memory through HHU. In addition to the above each meter shall also be provided with a RS-485, Ethernet and USB port on one of its sides, from where all the data stored in the meter's memory can also be transferred to CDCS (through DCU), local computer and external storage. The overall intention is to tap the data stored in the meter's memories at a scheduled time from any of the above mentioned ports or any other means and transmit the same to a remote central computer using suitable means of communication. It shall be possible to securely download the IEM data through a USB port via external storage thereby removing the requirement of an MRI (Meter Reading Instrument). It shall be ensured that data transfer through USB shall be unidirectional only i.e., from Meter to external storage device in an authentication process. Meter data shall be tamper-proof.
- b) All meters shall be compatible with Optical port, RS-485 port, Ethernet port and USB / RS-232 port all together at a time and communicate independently. It shall also be possible to obtain a print out (hard copy) of all data collected from the meters, using the local PC. Data collection from any local laptop/PC shall be possible by installing data collection software. Entire project has to be based on Optic Fibre/GSM/4G/3G. Participant should quote considering availability of Optic Fibre at 80% of locations and availability of PLCC/4G at 20 % of locations. This is for bringing all the RFPs on common platform. However, the selected agency will have to conduct detailed survey regarding availability of the particular service for all locations. The Participant may conduct Field Survey before submission of RFP.
- c) The Participant shall adhere to the appropriate security algorithm for encryption and decryption

Entire project has to be based on Optic Fibre/GSM/4G/3G. Participant should quote considering availability of Optic Fibre/PLCC/4G/3G/2G for all the locations. However, the selected agency will have to conduct detailed survey regarding



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availability of the particular service for all locations. Participants may do Site Survey for availability of communication media prior to submission of RFPs.

The Participant may design appropriate architecture for providing end to end metering solution. He is free to decide upon the best solution out of all the available options to ensure that data from all IEMs in ASSAM are available at State Load Despatch Centre by the scheduled time. However, the entire responsibility of fully functional end to end metering system shall rest with the Participant in order to meet the performance levels as given in this document. The communication provider may adopt Optical Fibre/GSM/3G/4G communication technology or a combination of these technologies as per the site requirement adopting best available technology in the proposed area of implementation. The successful Participant shall be responsible for proper data exchange among IEM, DCU, CDCS, MDP and other operational/requisite software as part of fully functional metering system.

The Participant shall design a reliable, interference free & robust communication network keeping in view the site conditions. It shall be flexible in terms of providing communication in variable terrain & urban density. The Participant shall design the network architecture keeping in view the existing and planned infrastructure of the utility. During designing, suitable consideration shall be kept for future expansion as per requirement of Utility. Before designing the communication network, the Participant 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 like DCUs, repeaters, routers & access points etc. shall be in the scope of Participant. The operational testing of all the network elements has to be demonstrated by the Participant to the satisfaction of the utility.

- d) The Participant shall provide the necessary software which would enable a local PC/ CDCS to:
- i. Accept the data from the Optical/Ethernet/WAN and store it in its memory in user defined formats (text, csv, xls, etc.) in a user-defined file name (file name format must be ddmmyy substation name-utility name).
 - ii. Polling feature along with a task scheduler to run the data downloading software at a pre-designated date and time repeatedly or by manually selecting a meter. File naming for such downloaded data should also be in user-defined format. A detailed activity log shall also be available for each downloading operation.
 - iii. Upload/Import meter data (binary files) in the software for further processing. While uploading, there shall be provision to upload all selected files with single key-stroke.
 - iv. Convert the binary file(s) to text file(s). There should be provision to select multiple files based on filename, convert all selected files with single key-stroke and store the text files in the same location where binary files are stored.
 - v. Display the collected data on PC's screen in text format, with forward/backward rolling
 - vi. Print out in text format the data collected from one or more meters, starting from a certain date and time, as per operator's instructions
 - vii. Transmit the collected data, in binary format, through an appropriate communication link to the central computer, starting from a certain date and time, as per operator's instructions.
 - viii. Store the collected data in binary format, on a CD/Pen Drive. In addition to above, in general the software shall be able to convert IEMs data to existing format as well as in tabular (.csv) format as applicable.
- e) The above software shall further ensure that absolutely no tampering (except erasing of complete data with password protection) of the collected metering data



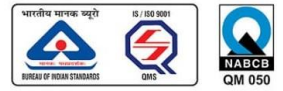
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- is possible during its handling by the PC. The software shall be suitable for the commonly available PCs, (Windows) and shall be supplied to Owner in a compatible form to enable its easy loading into the PCs available (or to be installed by the Owner/others) at the various substations.
- f) The Participant shall ensure data integrity checks on all metered data received from data collection systems.
- g) 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 supply of electricity needed for operation and maintenance of entire Metering system shall be provided free of cost by the respective owners of the premises.

7. Climatic Condition

The meters to be supplied against this specification shall be required to operate satisfactorily and continuously under the following tropical conditions of hot, humid, dusty, rust and fungus prone environment.

Maximum ambient air temperature (°C)	55
Minimum ambient air temperature (°C)	(-) 5
Average Daily ambient air temperature (°C)	32
Maximum Relative Humidity (%)	95
Minimum Relative Humidity (%)	10
Maximum altitude above sea level (m)	1000
Average Annual Rainfall (mm)	1200
Maximum Wind Pressure (Kg/sq.m)	195
Isoceraunic Level (days per year)	50
Seismic Level (Horizontal Accn. In g)	0.3

8. Quality Assurance

The quality control procedure to be adopted during manufacturing of the specified equipment shall be mutually discussed and finalized in due course, generally based on the established and proven practices of the manufacturer. The software shall be user friendly which can be easily installed in any PC/Laptop irrespective of operating system of the PC/Laptop, and shall be certified for ensuring data handling capabilities. The same shall be demonstrated by the party during technical evaluation. During demonstration party shall bring standard meter. Thereafter software shall be offered for technical compatibility before taking up further necessary action in the procurement process.



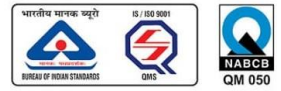
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9. Testing

- a) All equipment, after final assembly and before dispatch from manufacturer's works, shall be duly tested to verify that is suitable for supply to the Owner. Routine and acceptance tests shall be carried out on the meters in line with IS 14697.
- b) Any meter which fails to fully comply with the specification requirements shall be liable to be rejected by the Owner. However, the Owner may purchase such meters at a reduced price in case of marginal non-compliance, at his sole discretion.
- c) Acceptance Tests for PC Software and data down loading using meter communication ports- All IEMs after final assembly and before dspatch from Participant's/Manufacturer's works shall be duly tested to verify that they are suitable for downloading data using meter communication ports shall be subjected to the following acceptance test.
 - i. Downloading Meter Data from the Meter(s) to PC via optical port.
 - ii. Downloading meter data through USB port and RS 232.
 - iii. Downloading meter data to DCU/CDCS through Ethernet as well as RS 485 port.
 - iv. Compatibility with PC Software.
 - v. Functioning of Time synchronization, advance and retard time commands.
 - vi. Per meter downloading time verification.
- d) Copy of Certificate shall be submitted to SLDC

Type Tests

- a) One (1) meter in a batch shall be subjected to the complete range of type tests as per IS14697 and IS15959, after final assembly. In case of any failure to pass all specified tests, the Participant shall arrange to carry out the requisite modifications/replacements in the entire lot of meters at his own cost. After any such modifications and final assembly, two (2) meters selected out of the lot by the Owner's representative shall be subjected to the full range of type tests. The lot shall be accepted by the Owner only after successful type testing.
- b) The meters used for type testing shall be separately identified, duly marked, and supplied to the Owner in case they are fully functional and as good as other (new) meters, after necessary touching up/refurbishing. In case this is not possible, the Participant shall provide their replacements at no extra cost to Owner.
- c) The Participant shall arrange all type testing specified above, and bear all expenses for the same.
- d) Copy of Test certificate shall be submitted to SLDC.
- e) Type test certificates completed in all respect from NABL approved test house shall be submitted along with the offer

10. ANOMALY DETECTION FEATURES

The meter shall have features to detect and log the occurrence and restoration of following anomalies, along with date and time of event: 6.1.1. Phase wise Missing Potential – The meter shall detect missing potential (1 or 2 phases) provided the line current is above a specified threshold. The voltage at that stage would be below a specified threshold.

- Phase wise Current Circuit Reversal – The meter shall detect reversal of polarity provided the current terminals are reversed. This shall be recorded for 1 or 2 phase CT reversal.
- Voltage Unbalance – The meter shall detect voltage unbalance if there is unbalance in voltages.
- Current Unbalance – The meter shall detect current unbalance if there is unbalance in load conditions. Meter should ensure true system conditions before going for current unbalance checks.



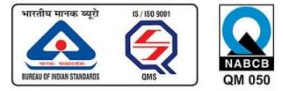
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- CT Miss – The meter shall detect current miss if the current is below a defined threshold, provided the phase voltage is above a specified threshold. Snapshots of phase wise voltage, phase wise active current and phase wise power factor shall be provided with above specified anomaly events. Further, each meter module shall record the following events along with total duration:
 - Power On/Off – The meter shall detect power off if both the auxiliary supplies fail. The event shall be recorded on the next power up. At the same time power on event shall be recorded. No snapshot shall be logged with this event.
 - Feeder Supply Fail -This event shall be logged when feeder supply, i.e., all the voltages go below certain threshold. No snapshot shall be logged with this event.
- Last three hundred & fifty (350) events (occurrence + restoration), in total, shall be stored in the meter memory on first in first out basis.
- There shall be five separate compartments for logging of different type of anomalies:

Compartment No. 1	100 events of missing potential
Compartment No. 2	100 events of CT reversal
Compartment No. 3	100 events of power failure/ Power on-off
Compartment No. 4	50 events of transaction related changes as per ICS Category B

Once one or more compartments have become full, the last anomaly event pertaining to the same compartment shall be entered and the earliest (first one) anomaly event should disappear. Thus, in this manner each succeeding anomaly event shall replace the earliest recorded event, compartment wise. Events of one compartment/ category should overwrite the events of their own compartment/ category only. In general persistence time of 5 min. for occurrence and restoration respectively need to be supported in meter.

- Anomaly count should increase as per occurrence (not restoration) of anomaly events. Total no. of counts shall be provided on BCS.

11. Installation and Commissioning

The static energy meters specified above shall be installed at various EHV substations owned by the Owner. The tentative list of substations along with the existing number of meters shall be as per site survey. The exact location for installation shall be provided by the Owner.

- a) The Participant shall be responsible for total installation and commissioning of the meters (along with test blocks, if supplied separately) as per Owner’s advice, including unpacking and inspection on receipt at site, mounting the meters on existing control and relay panels at an appropriate viewing height, connection of CT and VT circuits including any required rewiring, functional testing, commissioning and handing over. The Participant’s personnel shall procure/carry the necessary tools, equipment, materials and consumables (including insulated wires, lugs, ferrules, hardware etc.)
- b) As part of commissioning of DCDs the Participant shall load the software specified in clause 5(d) into the PCs at the respective substations, and fully commission the total meter reading scheme. He shall also impart the necessary instructions to substation engineers. At least 2-hour training session shall be arranged for substation staff and SLDCs. Also, an operating manual (pdf as well as hard copy) of the meter containing all details of the meter, various data downloading features, etc. shall be made available at site and SLDC.
- c) Participants to check the dimensions of the existing SEM’s. IEMs shall fit in the same location in the panel.
- d) Following technical information shall be furnished by the Participants in their offers:
 - Foreseen dimensions of proposed meter



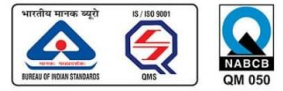
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- Expected weight of proposed meter
 - Dimensions and weight of the test block, if supplied separately.
- e) At the time of commissioning, the meters lying in stores shall be time synchronized through GPS signal before installation in the panel to avoid the large time mismatch.

12. General

- a) The meter shall be supplied with latest/compatible software (shall be compatible with old & new meters data download handling). Any new software as required to be installed within warranty period are to be done by party or through remote support to client.
- b) The total arrangement shall be such that one (1) operation (click on “data download from meter” button on software) can carry out the whole operation in about five (5) minutes per meter or preferably faster.
- c) The layout of software front end/user interface has to be approved by RLDC during technical evaluation/demonstration. However, a standard template sheet will be provided along with RFP for reference.
- d) Software for windows/office/antivirus to be supplied. Antivirus should not slow down processes and same will be demonstrated during technical demonstration.
- e) Above specification is minimum only, any higher standard required for the purpose intended (meter data handling) would be assessed by vendor and would be supplied accordingly. The detailed architecture shall be approved during drawing approval stage.
- f) Meter shall be accommodated in existing C&R panel of standard size (Alstom/ER/ABB/Siemens) in kiosk or C&R panel with door closed. If required before Bidding document, Participant may collect necessary data or else the scope is deemed to be included.
- g) Step by Step procedure (on screen shot type and desktop video capture) shall be provided for
- i. Installation/Re-installation of Database handling software in to Laptop / PC
 - ii. Meter maintenance/site-testing procedure as per relevant IS/IEC standard
 - iii. Procedure for data downloading from Meter by HHU/Laptop/Desktop PC.
- h) As on date of delivery, the supplied meters shall comply with all statutory regulation as required under CERC/CEA/IEGC as applicable and the same should be declared by the vendor during delivery along with warranty certificate.
- i) Participant is responsible for dismantling of old special energy meters and to purchase on buy back basis on successful installation of interface energy meters.

13. Dismantling / Buy-Back of Existing SEM

Dismantling of existing Energy Meters and taking it, away-shall also be in the scope of Participant.

14. WARRANTY

- i. The IEM shall be under warranty as per OEM standard Warranty Policy or 2(two) years whichever is higher. The Participant shall be responsible for meter testing as per CEA metering regulations.
- ii. The warranty would include repair, replacement, part material replacement cost and one way (return) transportation cost (including insurance of transit)
- iii. Meter software, if upgraded by OEM should be supplied free of cost with initiation taken from party. Remote service person name to be indicated during Bidding document



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- iv. Meters which are found defective/inoperative at the time of installation or become inoperative/defective within the warranty period, these defective/inoperative meters shall be replaced within one week of receipt of report for such defective/inoperative meters
- v. Copy of warranty certificate shall be submitted to owner

15. STANDARDS TO BE COMPLIED WITH

Figure 2: Standards to be complied

S.No	Reference	Reference Title
	Detail	
1	IS-15959:2011	Data Exchange for Electricity Meter Reading Tariff & Load Control – Companion Specification
2	IS-14697:1999	Specifications for AC Static Transformer operated Watt Hour & VAR-Hour meters, class of 0.2S and 0.5S
3	IEEE 830-1998	IEEE Recommended Practice for Software

16. Delivery:

Supply shall be completed within 4 months from the date of receipt of Purchase order.

GUARANTEED TECHNICAL PARTICULARS FOR 3 PHASE 4 WIRE ABT ENERGY METER FOR FORWARDED METERING

S.No.	Item	Participant's data
1.	Type	
2.	Application	
3.	Rated Voltage	
4.	Rated Current	
5.	Frequency	
6.	Minimum starting current in % of base current	
7.	Power loss in potential circuit	
8.	Power loss in current circuit	
9.	Change in error due to	
	i. Variation in frequency	
	ii. Variation in voltage	
10.	Accuracy Class	
11.	Total Weight of meter	
12.	Details of case	
13.	Standard to which the meter confirms	
14.	Type of Energy Registration Mechanism.	
15.	MD Reset Mechanism	
16.	MD reset button with sealing provision	
17.	Two LEDs for accuracy measurement	



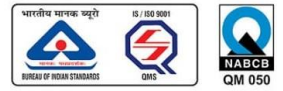
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	Working range	
18.	Voltage	
19.	Current	
20.	Display details	
	i. Display Cycle (page mode display)	
	ii. Period of display of each parameter	
	iii. Display scroll-lock facility	
	iv. Backlit LCD	
	v. Relevant OBIS codes for parameter	
	vi. Legend for Cover open detection	
	vii. Legend for Magnet event	
21.	Power on in absence of mains	
	i. Internal / External Battery	
	ii. Display access	
	iii. Reading (Data downloading)	
22.	Total Events (300 nos)	
23.	Load Survey	
24.	Parameter Logged	
25.	Logging interval	
26.	No. of days of Load Survey	
27.	Capability for fraud Prevention & detection	
28.	Sealing and Locking Arrangement	
29.	Type of communication	
	i. Local- Optical port IEC 1107	
	ii. RS 485 port for remote comms	

Schedule B:

TECHNICAL SPECIFICATION FOR STATIC 3 PHASE 4 WIRE CT OPERATED TRI-VECTOR ENERGY METER for LT station auxiliary feeders.

1. OBJECTIVE & SCOPE

This specification shall cover design, engineering, manufacture, assembly, inspection, testing at manufacturers works before dispatch, supply and delivery at destination anywhere in "state", **Class 0.5s** accuracy class static 3 phase-4 wire CT operated three-vector, RS-485 port energy meter. The meter shall be suitable for measurement of energy and power, demand requirement in an AC balanced/unbalanced system over a power factor range of zero lag to unity. These meters should have communication port to interface for remote meter reading.

2. SERVICE CONDITION

The meter shall be suitable for satisfactory continuous operation under the following tropical conditions:

- Maximum ambient temperature : 50 °C
- Maximum ambient temperature in shade : 45 °C
- Relative Humidity : 10 to 95%
- Maximum annual rainfall : 1450 mm'
- Maximum wind pressure : 150 Kg/m. sq.
- Maximum altitude above mean seal level : 1000 meters
- Isoceraunic level : 50 days/year
- Seismic level (Horizontal acceleration) : 0.3g
- Moderately hot and humid tropical climate

3. APPLICABLE STANDARDS

The CT operated energy meter shall be of accuracy Class 0.5 for active/ reactive / apparent energy and conform to relevant clauses of following standards or report: -



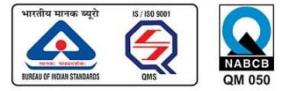
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IS 14697: 1999	Specification for A.C Static Transformer operated Watt Hour & VAR – Hour meters, class 0.5s
CBIP Technical Report No. 304	Specification for A.C. Static Electrical Energy Meters.
IS 15959 (Companion specification)	DLMS Indian Companion Standard – Category ‘A’ for Energy accounting and audit metering

Unless otherwise specified elsewhere in this specification the static meters shall conform to the latest version available of the standard as specified above.

4. GENERAL TECHNICAL REQUIREMENT

- 4.1 Application : 3 phase 4 wire
- 4.2 Rated Secondary Voltage : 240 volts (Phase to Neutral)
- 4.3 Rated secondary Current (I Basic) : 5 Amps
- 4.4 Rated Frequency : 50 Hz.
- 4.5 Accuracy class : 0.5s (the meter should meet the same class of accuracy for reactive energy also)
- 4.6 Power Factor : Unity to Zero (all power factor lag / or lead)
- 4.7 The 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: $V_{ref} \pm 30\%$
Frequency: $50 \text{ Hz} \pm 5\%$
- 4.8 Temperature: The standard reference temperature for performance shall be 27 °C. The mean temperature co-efficient shall not exceed 0.03%.
- 4.9 The reactive accuracy class of the meter shall be same as the active accuracy class

5. INFLUENCE QUANTITIES:

The meter should be designed and protected such that all external effects and influences shall not change its performance & shall work satisfactorily within guaranteed accuracy limits, as specified in IS 14697: 1999 / CBIP technical report – 304, under the presence of influence quantities.

6. CONSTRUCTION

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. 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.

6.1 GENERAL MECHANICAL REQUIREMENTS

The construction of the meter shall be rigid & suitable to withstand shock & vibration involved in transportation & handling, as specified in IS 14697. 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. The design of meter shall conform to IP51 class degree of protection against dust and moisture as per relevant standards.



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6.2 TROPICAL TREATMENT

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. Meters shall withstand solar radiation. 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. 2. The meter shall work from -10°C to +55°C and RH 95% non-condensing type.

6.3 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 offered shall be such that it can be sealed independently and the cover cannot be removed with the use of a tool, without breaking the seal. The case of offered meters shall be so constructed that any non-permanent deformation shall not prevent the satisfactory operation of the meter. The meter shall have a transparent cover and opaque base with seamless ultrasonic welding.

6.4 TERMINALS -TERMINAL BLOCK

The base of the meter shall have a terminal block at the bottom made out of high grade engineering plastic so as to facilitate bottom connection and houses solid nickel plated brass terminals having capability to carry maximum value of current.

The material of the terminal block shall be capable of passing the tests given in IS 14697: 1999.

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 current terminals shall not be less than 5.0 mm & shall be of adequate length in order to have proper grip of conductors / crimping pins with the help of two screws.

The terminal block shall satisfy all the conditions such as clearance & creepage distance between terminals & surrounding part of the meter as specified in relevant clause of IS 14697: 1999.

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 minimised. Electrical connections shall be so designed that contact pressure shall not be transmitted through insulating material.

6.5 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 min 40+5mm, thus allowing sufficient clearance space for inserting cables. ETBC shall have a top side 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 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.

6.6 WINDOW

The energy meter cover shall be made of high-grade engineering plastic with one window. The window shall be of transparent material ultrasonically welded with the meter cover such that it cannot be removed undamaged without breaking the meter cover seals.

6.7 QUALITY

Overall, the quality of the meter should be good and the service life of the meter shall be more than the guarantee period. The material, components used for manufacturing the meter shall be of premium quality. The LCD display shall not fade with time and the display annunciators should be visible. Functionality of the meter shall not be affected by the harsh environmental conditions. Quality meters shall be given preference and the performance of



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previous installed meters shall be analyzed before awarding the tender. Aesthetically, the meter shall be of premium quality.

7. COMMUNICATION PORT

a) LOCAL COMMUNICATION PORT

The energy meter shall have a galvanically isolated IEC 1107 optical communication port located in front of the meter for data transfer to or from a hand held Data Collection Device. The sealing provision should be available for optical port.

b) REMOTE COMMUNICATION PORT

Meter shall have an additional communication port (RS 485) in the form of RJ11 port to interface external modem for remote data collection. RS 485 (RJ11) port shall be located under the terminal cover.

Both the ports will support communication on DLMS and should be accessible through a DLMS compliant HHU

8. DATA DOWNLOADING CAPABILITY

a). Meter shall support a minimum baud rate of 9600 on optical port as well as RS 485 remote communication port. It shall be possible to read selective data from the meter as specified in the companion standard.

9. DISPLAY OF MEASURED VALUE:

- a) The measured value(s) shall be displayed on eight segments, eight-digit Liquid Crystal Display (LCD) display unit/register, having minimum character height of 10 mm.
- b) The data should be stored in non-volatile memory. The non-volatile memory should retain data for a period of not less than 10 years under unpowered condition. Battery back-up memory will not be considered as NVM.
- c) It should be possible to easily identify the single or multiple displayed parameters through symbols/legend on the meter display itself or through display annunciators.
- d) Meter shall have Scroll Lock facility to display any one desired parameter continuously from display parameters.
- e) The register shall be able to record and display starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor. The register should not roll over in between this duration.

The principle unit for the measured values shall be Wh/kWh/MWh for active energy, VARh/kVARh/MVARh for reactive energy & VAh/kVAh/MVAh for apparent energy based on secondary current. Participant shall mention the scale in which the meter displays the energy values.

Required display list will be given at the time of order. However, it will be in line with companion standard such as:

- Real Time
- Date
- Line currents
- Phase to Neutral Voltages
- Phase wise Power Factor
- Frequency
- Active, Reactive and Apparent Power
- Cumulative tamper count
- Cumulative MD reset Count
- Cumulative active forwarded energy
- Cumulative reactive lag forwarded energy
- Cumulative reactive lead forwarded energy



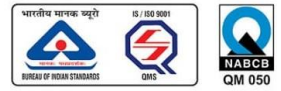
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- Cumulative apparent forwarded energy
- Universal active maximum demand with date and time
- Universal apparent maximum demand with date and time
- Present PT status
- Present CT status
- Other status
- Last occurred and restored tamper with date and time
- High resolution active forwarded energy
- High resolution reactive lag forwarded energy
- High resolution reactive lead forwarded energy
- High resolution apparent forwarded energy

Above listed displays shall be configurable in three different pages in push mode for easy access in mains on condition. First page should contain the instantaneous parameters, second page, for energy and demand values, and third page for tamper related displays.

The meter should have visual quadrant representation on the LCD for energy measurement. Relevant quadrant in which metering is taking place should be in on state for ease of understanding.

Parameter value with relevant OBIS code should also be simultaneously available along with the respective values on the display.

10. ELECTROMAGNETIC COMPATIBILITY

The static energy meters shall conform to requirements listed in relevant standards and shall also be protected against radiated interference from either magnetic or radio-frequency source.

11. 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

a. RADIO INTERFERENCE SUPPRESSIONS

The meter shall not generate noise, which could interfere with other equipment, and meter shall work satisfactorily as per relevant standards

b. INFLUENCE OF HIGH MAGNETIC FIELD

The meters shall be provided appropriate magnetic shielding so that any external magnetic field (AC/DC electromagnet) as per CBIP Technical Report no. 304 applied on meter would not affect the proper functioning of the meter and meter shall work satisfactorily as per relevant standards.

12. STARTING CURRENT

The meter shall start and continue to register at the current 0.1% of I_b .

13. RUNNING WITH NO LOAD

When the 115% of rated voltage is applied with no current flowing in the current circuit, the meters shall not register any energy and test output of the meter shall not be more than one pulse/count on "no load".

14. POWER CONSUMPTION



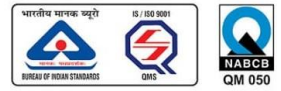
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- 14.1 The active and apparent power consumption in each voltage circuit of the CT Operated meters at reference voltage; temperature and frequency shall not exceed 1.0 W and 4 VA per phase respectively.
- 14.2 The apparent power consumption in each current circuit for the CT Operated meters at basic current, reference frequency and reference temperature shall not exceed 1.0 VA per phase.

15. CALIBRATION & TEST OUTPUT

All the meters shall be tested, calibrated and sealed at works before despatch. Further, no modification of calibration shall be possible at site by any means.

However, it shall be possible to check the accuracy of energy measurement of the meter in the field by means of LED output on meter. Meter should have two calibration LEDs for accuracy measurement for different energies. Out of these, one should be kept fixed on kWh and other one shall be configurable for rest two (kVAh, kVAh). Resolution of the test output shall be sufficient to enable the starting current test in less than 10 minutes

16. 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.

17. QUANTITIES TO BE MEASURED:

The meter shall be able to provide the following data in line with Category 'C' type as per IS 15959 - Indian Companion Specification.

- a) Instantaneous Parameters
- b) Block Profile / Load Survey data
- c) Abstract quantities
 - Name Plate Details
 - Programmable parameters
- d) Event Conditions.

The meter shall be able to measure and provide the parameters listed in the guideline document. The OBIS code for each parameter shall be as identified as per DLMS /COSEM protocol in line with Indian companion standard.

18. ABNORMALITY EVENTS DETECTION:

The meter should have features to detect the occurrence and restoration of, at least, the following common abnormal events:

- a) **Missing Potential:** The meter shall be capable of detecting and recording occurrence and restoration with date and time the cases of Potential failure (one phase or two phases). All potential missing cases shall be considered as power failure.
- b) **Current imbalance:** The meter shall be capable of detecting and recording occurrence and restoration with date and time of Current unbalance (for more than a defined persistence time).
- c) **Current Reversal:** The meter shall be capable of detecting and recording occurrence and restoration with date and time if the current is flowing in reverse direction in one or more phases. The meter shall continue to record in forwarded direction even in case of CT reversal.
- d) **Power on/off:** The meter shall be capable to record power on /off events in the meter memory. All potential failure should record as power off event.
- e) **Magnetic Influence** - The Meter shall be capable of detecting and recording of presence of abnormal magnetic influence near the meter, if the magnetic influence affects the meter functionality. The meter should record at I_{max} on account of magnetic influence. Separate legend for magnet event shall be made available on LCD. This legend shall remain in on state till meter reading so that it will come in to notice of meter reader.
- f) **Voltage unbalance** – Meter shall detect voltage unbalance if there is unbalance in voltages.
- g) **Over Current**– When load condition at any phase i.e., Line current at any phase goes more than defined limit, this will be detected as Over current condition.
- h) **Neutral Disturbance** – The meter should detect neutral disturbance if any spurious signal is applied at the meter's neutral.
- i) **High and Low Voltage:** The meter should detect under and over voltage events respectively if voltage falls / rise from defined limits.



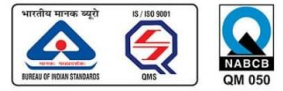
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- j) **Cover Open:** The meter shall be able to detect cover open occurrence event if cover is opened in mains on or off condition. Separate legend for cover open event shall be made available on LCD. This legend shall remain in on state till meter reading so that it will come in to notice of meter reader
The above shall be selectable and will be in line with IS 15959: Data Exchange for Electricity Meter Reading, Tariff and Load Control – Companion Specification
The meter shall keep records for the minimum last 300 events (occurrence + restoration) for above abnormal conditions. Each event shall be logged with date and time of occurrence/restoration with snapshot of voltage, current power factor and active energy (except cover open, power on-off). It shall be possible to retrieve the abnormal event data locally using a hand held unit (HHU) through the meter's optical port & same can be viewed / analysed at base computer end in simple and easily understandable format.

19. ABNORMAL VOLTAGE/FREQUENCY DEVICE TEST:

The accuracy of the meter would not be affected with the application of abnormal voltage/ frequency generating device having spark discharge of approximately 35KV. The meter will be tested by feeding the output of this device to meter in any of the following manner for 10 minutes:

- i. On any of the phase or neutral terminals.
- ii. On any connecting wires of the meter.
- iii. Voltage discharge with 0-10 mm spark gap.
- iv. Spark on meter body.
- v. Spark on the optical and RS 232 port.
- vi. At any place in load circuit.

The accuracy of the meter will be checked before and after the application of above device.

20. LOAD SURVEY: -

Meter should support parameters as mentioned IS-15959 for Category "A"

Following parameters shall be made available for last 60 days with integration period of 15 min. Out of which the utility should be able to select any five parameters

- Real time clock, date and time.
- Current, I_r
- Current, I_y
- Current, I_b
- Voltage R Phase
- Voltage B Phase
- Voltage Y Phase
- Active forwarded Energy
- Reactive lag forwarded energy
- Reactive lead forwarded energy
- Apparent Energy

These load survey data can be retrieved with the help of Meter Reading Instrument on local interrogation or remotely using the remote communication interface.

21. MD REGISTRATION

The meter shall continuously monitor and calculate maximum demand for each interval of time, which may be programmable as a block of 15 minutes or 30 minutes (30 minutes by default). At the end of every demand integration period the new calculated MD shall be compared with the previous MD and meter shall store whichever value is higher.

22. MD RESET

The meter shall have any of the following MD resetting options: -

- (a) Automatic reset at the end of a certain predefined period (say, end of the month)
- (b) Manual resetting arrangement (MD reset button) with sealing facility.
- (c) MD reset through authenticated transaction



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23. SELF DIAGNOSTIC FEATURE

The meter shall be capable of performing complete self-diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data memory location at all time. The meter shall have indication for unsatisfactory/non-functioning/malfunctioning of the following:

- Time and date on meter display
- All display segments on meter display
- Self-diagnostic (RTC, NVM information) on display

24. OTHER SALIENT FEATURES OF METERS

- It should be possible to check the healthiness of phase voltages by phase indicator available on meter display.
- The meter shall have provision of reading in the absence of power through an internal battery. It shall be possible to access the display in power off condition. It shall also be possible to do meter data download through MRI under power off condition.
- The meter should work accurately irrespective of phase sequence of the supply.

25. TEST AND TEST CONDITIONS

- Acceptance test: All acceptance tests as per relevant standards shall be carried out in the presence of utility representatives.
- Routine Test: All the routine tests as per – IS 14697 shall be carried out and routine tests certificates shall be submitted for approval of purchaser.

Schedule of Requirements and Delivery

Delivery:

Supply shall be completed within 4(Four) months from the date of receipt of Purchase order.

GUARANTEED TECHNICAL PARTICULARS FOR 3 PHASE 4 WIRE CT OPERATED L.T.-TRIVECTOR ENERGY METER FOR FORWARDED METERING

S.No.	Item	Participant's data
1.	Type	
2	Application	
3	Rated Voltage	
4	Rated Current	
5	Frequency	
6	Minimum starting current in % of base current	
7	Power loss in potential circuit	
8	Power loss in current circuit	
9	Change in error due to	
	iii. Variation in frequency	
	iv. Variation in voltage	
10	Accuracy Class	
11	Total Weight of meter	
12	Details of case	
13	Standard to which the meter confirms	



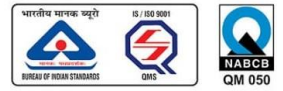
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14	Type of Energy Registration Mechanism.	
15	MD Reset Mechanism	
16	MD reset button with sealing provision	
17	Two LEDs for accuracy measurement	
	Working range	
18	Voltage	
19	Current	
20	Display details	
	i. Display Cycle (page mode display)	
	ii.Period of display of each parameter	
	iii.Display scroll-lock facility	
	iv.Backlit LCD	
	v.Relevant OBIS codes for parameter	
	vi. Legend for Cover open detection	
	vii.Legend for Magnet event	
21	Power on in absence of mains	
	I. Internal / External Battery	
	ii. Display access	
	iii. Reading (Data downloading)	
22	Total Events (300 nos)	
23	Load Survey	
24	Parameter Logged	
25	Logging interval	
26	No. of days of Load Survey	
27	Capability for fraud Prevention & detection	
28	Sealing and Locking Arrangement	
29	Type of communication a).Local- Optical port IEC 1107 b). RS 485 port for remote comms	
30.	Event Logging Current Related events: <ul style="list-style-type: none"> • CT reversal (phase wise) • Current imbalance • Over Current Voltage related events <ul style="list-style-type: none"> • PT missing (phase wise) • Voltage unbalance • High and low voltage Others: <ul style="list-style-type: none"> • Magnet • Neutral Disturbance • Low Power factor Non-Rollover events <ul style="list-style-type: none"> • Front Cover open Power on-off events	



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Demonstration

- The purchaser reserves the right to ask to give the demonstration of the equipment offered at the purchaser's place.

Base Computer Software

- For efficient and speedy recovery of data downloaded through CMRI on base computer, licensed copies of base computer software shall have to be supplied free of cost. This software will be used at number of places up to Substation level. As many copies of base computer software as required up to Substation level shall be provided by Supplier free of cost even after upgradation of software.
- The meter shall be capable to communicate directly with laptop computer. Base Computer Software shall be suitable for all types of printers such as dot matrix, inkjet, desk jet and laser printers.
- The Base Computer Software shall be "Windows" based & user friendly. The data transfer shall be highly reliable and fraud proof (No editing shall be possible on base computer as well as CMRI by any means). The software shall have capability to convert all the data into ASCII format/ XML format as per MIOS. The BCS shall function properly and support Windows 10 new version.
- The Base Computer Software should be password protected.
- The total time taken for downloading Billing, Tamper and Load Survey Data for 60 days shall be less than or equal to 15 minutes.
- Downloading time of only Billing data shall be less than or equal to 60 secs.
- The BCS software shall create one single file for the uploaded data, e.g. if CMRI contains the meter readings of, say, 2,000 consumer meters including with meter reading of boundary energy meters and the said data is uploaded to BCS, then the BCS shall create a single file containing separate records for each consumer meter reading and boundary energy meter reading in ASCII format or XML file as per MIOS for individual meter reading.
- Meter manufacturers should also need to submit Convert API (API3) as per MIOS universal standard along with Base Computer System free of cost. This API should be capable of converting both data i.e. AMR data collected from Read API (API1) and MRI data collected from CMRI.
- Also, there shall be a provision to give filenames while creating the file. Alternatively, the file to be downloaded shall be automatically saved with a file number comprising of Real date, time & downloading activity for respective date. For ex., 170817120501 where, 170817 will denote the date, 1205 will denote the time & 01 will indicate the first downloading activity on that date. This will completely overrule the possibility of file to be overwritten.
- As and when the meter manufacturer releases new or latest or advanced versions of meter hardware/ firmware / software (such as Base Computer System, API3 etc), the same shall be made available to purchaser immediately on the release date free of cost. The latest version shall support all existing hardware/ meters in the field. The meter manufacturer should also provide support for changes and integration of Base Computer System and API3.
- The meter samples shall be tested by our IT Department for the time required for downloading the data as per specifications and as confirmed by the Participant.
- Downloading software shall also be provided so as to install on our Laptop for downloading data directly on Laptop from meter without the use of CMRI.
- The software provided on laptop or PC shall be compatible to read the data from USB drive and for that purpose a sample cable (1 No.) shall be provided with USB termination. USB being the de- facto standard, this is the requirement.



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Common Meter Reading Instrument (CMRI)

- To enable local reading of meters data, a DLMS compliant CMRI shall be provided.
- The CMRI shall be as per specification of IS: 15959 / 2011 AMENDED UP TO DATE.
- It shall be compatible to the DLMS compliant energy meters that are to be procured / supplied on the basis of this specification.
- The CMRI shall be supplied by the meter manufacturer along with the meter free of cost in the ratio of one for each 50 Nos. meters supplied including user manual and a set of direct communication cords for data downloading on the Laptop or PC for each CMRI.
- There shall be a provision for auto power save on CMRI, which shall force the instrument in the power saving mode in case of no - activity within 5 minutes. The data shall not be lost in the event the batteries are drained or removed from the CMRI.
- The CMRI shall have a memory capacity of 8GB with USB SRAM (Static RAM) with battery backup & upgradeable and BIOS /OS on FLASH/ EEPROM Memory of 512 MB.
- The manufacturer / supplier shall modify the compatibility of CMRI with the meter and the base computer system due to any change in language or any other reasons at their own cost within guarantee period.
- The CMRI shall be type tested for (a) Tests of Mechanical requirement such as Free fall test, Shock Test, Vibration test, (b) Tests of Climatic influences such as Tests of Protection against Penetration of Dust and Water (IP 6X), Dry Heat test, Cold Test, Damp Heat Cyclic Test, (c) Tests for Electromagnetic Compatibility (EMC), (d) Test of Immunity to Electromagnetic HF Fields and (e) Radio Interference Measurement.
- The equipment offered shall be fully type tested at approved laboratory by National Accreditation Board for Testing and Calibration Laboratories (NABL) as per relevant standards within last 5 years from the date of opening of tender & the type test reports shall be enclosed with the offer.



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Annexure B

List of Substations

Sl No	Name of the Substation	Nos. of IEM	Nos. of Network Switches (4/8/16 Port as required)
1	Agia		
2	APM		
3	Barnagar		
4	Bilashipara		
5	Behiating		
6	B. Chariali		
7	Bokakhat		
8	Bokajan		
9	Boko		
10	Bordubi		
11	BTPS(Salakati)		
12	Baghjap		
13	CTPS		
14	Capital(Dispur)		
15	Depota		
16	Dhaligaon		
17	Dhemaji		
18	Dhekiajulee		
19	Dibrugarh		
20	Diphu		
21	Dullabcherra		
22	Garagaon(Nazira)		
23	Gauripur(Matiabag)		
24	Ghoramari		
25	Gohpur		
26	Golaghat		
27	Gossaigaon(Joyma)		
28	Haflong		
29	Hailakandi		
30	Jawaharnagar GIS		
31	Jorhat(West)		
32	Jorhat (Garamur)		
33	Kahilipara		
34	Kamalpur GIS		
35	Kokrajhar		
36	Khaloigaon(Nagaon)		
37	Kamakhya GIS		
38	LTPS		



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39	Ledo(Margherita)		
40	Matia		
41	Mirza(Kukumara)		
42	Majuli		
43	Mariani		
44	Moran		
45	Nalkata(N. Lakhimpur)		
46	Nalbari		
47	Narengi		
48	NTPS		
49	Pailapul		
50	Panchgram		
51	Rangia old (132kV)		
52	Rangia New (220kV)		
53	Rowta		
54	Rupai		
55	Samaguri		
56	Sarusajai		
57	Sisugram		
58	Sankardevnagar(Lanka)		
59	Sonabil		
60	Sibsagar(Betbari)		
61	Sipajhar(Poonia)		
62	Sonari		
63	Sonapur GIS		
64	Srikona		
65	Tinsukia		
66	Umrangshu		
67	Azara		
68	Karimganj		
69	Hatsingimari		
70	Barpeta		
	TOTAL No:		



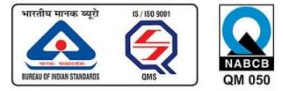
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Annexure C

Bill of Quantities (BOQ):

The schedules of requirement in respect of 'Major Goods and Services' are listed below:

SUPPLY PART

Field Level Infrastructure at Substation Switchyard

SN	Description	UOM	Total Qty
1	0.2s Class ABT Meter (Annexure-I)	No	433
2	of 0.5S CLASS LT Meters (Annexure-I)	No	70
3	Industrial Ethernet Switch(Type-A)	No	70

In addition to the BoQ line items for sub-stations the following items need to be supplied wherever required:

Fiber Optic Distribution Panel (FODP) 48 fiber, Armored Single Mode Fiber Optic Cable, Armored Multi Mode Fiber Optic Cable, Miscellaneous Communication Cable(CAT6/CAT5e armored), RJ45 Connector Optical Patch Cord etc.

Bidders may assess the quantities required for the same prior to bid submission.

For connection of meter to CT, PT the following items need to be supplied:

Wire (10 Core, 2.5 Sq MM) For CT wiring, Wire (5 Core, 2.5 Sq MM) For PT wiring

Bidders may assess the quantities required for the same prior to RFQ submission.

** Software for fulfilling performance along with required licenses for all supplied hardware as per technical specification is to be provided by the contractor



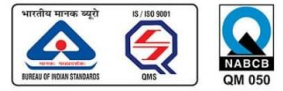
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Annexure D

Sample format for submission of PRICE-BID:

1	Name of the Agency
2	Profile of the Agency (in brief)
3	Name of the Proprietor/Owner/ Managing Director of the Agency
4	Full Address of Registered Office
	a. Telephone No.
	b. Fax No.
5	Full Address of Local Office (NER)
	a. Telephone No.
	b. Fax No.



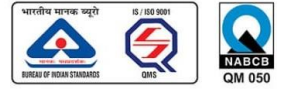
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Sl. No.	Item	Price Quote (in Indian Rupees)
Part-A	<p>Price</p> <p>a).“Supply, installation, Testing & Commissioning of SAMAST compliant 0.2 S CLASS ABT energy Meters (433 nos.) on existing metering panel for GSSs of AEGCL, to be installed at the T-D interface points and the supplied meters are to be integrated network switch and Local PC for viewing & data downloading in the 70 nos. of GSSs of AEGCL.</p> <p>(NB:-works includes Installation energy meters to Lan switch, TCP/IP Networking from meter to meter, Communication cable in between Energy meter to Switch, software at Sub Station PC.)</p> <p>b).“Supply, installation, Testing & Commissioning of 0.5S CLASS LT Meters with ring CT in Grid substations of AEGCL and the supplied meters are to be integrated with network switch and local PC for data downloading.(70 nos.)</p>	
Part B	Taxes as applicable for Part-A (estimated)	
Part C	Grand Total (Part-A+Part-B)	

Date:

Place:

Signature:

Name:

Designation: