ITI LIMITED
PALAKKAD PLANT
KANJIKODE WEST, PALAKKAD – 678 623, KERALA STATE, INDIA

EXPRESSION OF INTEREST FOR SELECTION OF SYSTEM INTEGRATOR FOR PROVIDING ADVANCED METERING INFRASTRUCTURE (AMI) TOTAL SOLUTION FOR SMART ENERGY METERS

Ref: ITI/SEM-AMI/EOI/01 **Date: 19/06/2021**

ITI Ltd, founded in 1948, is the first Central Public Sector Unit of independent India under the Department of Telecommunications, Ministry of Communications & IT. To cater to the new emerging business opportunities under the Make in India /Atma Nirbhar Bharat Missions of Govt of India, ITI has forayed into manufacture of diverse products such as Smart Energy Meters, OFC, PLB HDPE Duct, Solar Panels, WiFi Access Points, Micro PCs, banking cards and other smart card solutions.

The Palakkad plant of ITI Limited is an ISO 9001:2015 and ISO 14001:2015 certified company. ITI is currently executing the order for the supply of Smart Energy Meters to various DISCOMs. As part of addressing the market requirement, we are planning to have business tie up with a reputed System Integrator for providing total solution of Advanced Metering Infrastructure (AMI) for Smart Energy Meters and jointly address the tenders and requirements of various DISCOMs, EESL and other private customers.

ITI invites Expression of interest from reputed, technically and financially sound System Integrator willing to partner with ITI for providing Automatic metering Infrastructure (AMI) total solution for Smart Energy Meters.

The tender will be processed as a single bid system through open tender.

Schedule	Date
EOI Issue Date	19/06/2021
Due date for queries for clarification	26/06/2021
Release of response to queries	03/07/2021
Due date for submission of EOI	26/07/2021 2.00 P M
Technical Bid Opening at ITI Palakkad	26/07/2021 2.30 P M

Earnest Money Deposit and Tender Fee: - Bidder shall Provide an EMD of Rs.5,00,000/-(Refundable) and a tender fee of Rs.10,000/-(Non Refundable) as separate DDs.

The Bid documents will be available online through ITI portal www.itiltd-india.com and https://eprocure.gov.in/cppp/.

Submission of response to this EoI shall be deemed to have been done after careful study and examination of this document with full understanding of its Scope, Specifications, Terms, conditions & implications.

Thanking you,
For ITI Ltd, Palakkad

Deputy General Manager (TS & Mkt)
ITI Limited,
Kanjikode West, Palakkad - 678623
Ph: 0491-2568844
Mobile: 09497128550
Email: bindums_pkd@itiltd.co.in
Web Site: https://www.itipalakkad.in/, Corporate Web site: https://www.itiltd.in/

EXPRESSION OF INTEREST FOR SELECTION OF SYSTEM INTEGRATOR FOR PROVIDING ADVANCED METERING INFRASTRUCTURE (AMI) TOTAL SOLUTION FOR SMART ENERGY METERS

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EXPRESSION OF INTEREST FOR SELECTION OF SYSTEM INTEGRATOR FOR PROVIDING ADVANCED METERING INFRASTRUCTURE (AMI) TOTAL SOLUTION FOR SMART ENERGY METERS

1) Introduction

1.1) ITI Limited, a Public Sector Undertaking under the Department of Telecommunications, Ministry of Communications & IT, is a leading Telecom equipment manufacturer and solution provider in India. The major customers are BSNL, MTNL, Defence, Paramilitary forces and Railways. ITI is having 6 manufacturing plants and 25 Marketing, Service and Project offices (MSPs) across the country.

1.2) ITI LIMITED, PALAKKAD was established in the year 1976, which is situated along National Highway between Coimbatore and Palakkad in the State of Kerala. This Plant has been successfully deploying telecom solutions for BSNL and MTNL Networks and has been rated as a major telecom equipment manufacturer and service provider. ITI Limited Palakkad is an ISO 9001:2015 and ISO 14001:2015 certified company.

1.3) ITI Palakkad is having the state of the art electronic manufacturing facilities for the assembly and testing of electronic products. Palakkad plant has ventured into the manufacturing of Smart Energy Meters as per the latest standard IS 16444 . The unit is having the manufacturing infrastructure for the manufacturing and testing of Smart energy meters. We have NABL accreditation as per IS 17025: 2017 standards for the Calibration Laboratory of Smart Energy meters The unit is also having PCB Manufacturing facility which can support the manufacturing of PCBs up to 10 layers.

2) Purpose of EOI

2.1) As part of addressing emerging business opportunities, ITI is planning to forge business relationship with International /National reputed System Integrators having Advanced Metering Infrastructure (AMI) solution for Smart Energy Meters and jointly address the tenders and requirements of various customers.

2.2) The selected partner along with ITI can form as a Consortium and jointly address the tenders and forthcoming requirements of various DISCOMs across the country. ITI as a Central PSU will be the lead bidder and meter manufacturer for all the business opportunities.

2.3) With this background, ITI invites EoI from technically and financially sound AMI System Integrators willing to partner with ITI for providing Automatic metering Infrastructure (AMI) total solution for Smart Energy Meters.

3) Scope of activities

3.1) The scope of the AMI System Integrator includes Site survey, planning, design ,engineering, proof of concept, supply, delivery at site, storage, installation, system integration , configuration, testing , commissioning, demonstration for acceptance, training , warranty /AMC support and documentation as per customer requirements.

3.2) System Integrator shall install all the supplied meters at the specified locations and establish the required communication network and integration with backend system.

3.3) System Integrator should have the capability to access the real time data and provide all information on a single console in an integrated manner to remotely control the entire network and increase operational efficiency.

3.4) The AMI System Integrator should establish network platform that can support all the applications like HES, MDMS etc over the Communication network.

3.5) Deployment of all the application on Cloud including HES and MDMS. Depending upon the opportunity, the cloud could be managed by the System Integrator with the servers being deployed in the Customer data centre or ITI data centre or deployed by the System Integrator itself.

3.6) System Integration with existing legacy system and upcoming DISCOM systems including metering, billing and collection.

3.7) Development of interface with mobile app and web portal /Dashboard. A mobile application also to be designed and developed for the end customers depending on the opportunity.

3.8) The System Integrator should ensure the device level interoperability and it will be the responsibility of System Integrator to ensure that all systems, sub systems , equipment and devices shall conform in all aspects to high standards of engineering, design & workmanship and shall be capable of performing continuous commercial operation as per the existing and upcoming future requirements of the customer. ITI should have the option to ensure the testing of the meter integrating to the system at the premises of AMI System Integrator or may set up infrastructure at ITI as situation requires.

3.9) Facility Management System (FMS) support during the project duration. This may also include setting up of physical work premises at the Customer location, setting up of call center, integrating with Customer NOC etc depending upon the opportunity & requirements.

3.10) System Integrator has to implement and commission AMI system architecture capable of upgrades and scaling as per customer requirements with robust system security features with due consideration of data privacy, confidentiality , cyber security guidelines etc.

3.11) The System Integration partner shall be responsible for proper data exchange among smart meters, MDMS, HES and other operational/requisite software as part of fully functional AMI system.

3.12) The System Integrator shall submit a Technical Solution document describing overall architecture and operational philosophy of the proposed AMI solution including the methodology for achieving communication requirements (GPRS (2G/3G/4G/5G in future), RF mesh, Hybrid solution of RF and GPRS(2G/3G/4G/5G in future), NB-IoT or any other as required) and different functionalities and also highlight additional features along with limitations if any. System Integrator will be responsible for deploying and maintaining DCU solutions for any RF mesh based opportunities.

3.13) The selected System Integrator shall be willing to associate with ITI in addressing the tenders and various requirements of the customers and implementing the project abiding to the Customer terms and conditions.

3.14) The System Integrator has to assist ITI to provide demos/presentations to customers as required at its own cost . Sales & Marketing costs for any opportunity will be borne by the System Integrator

3.15) The System Integrator has to undertake the responsibility of successfully carrying out the field trial/proof of concept (PoC) as part of pre-supply qualification as per the customer order conditions and requirements free of cost.

3.16) The System Integrator shall implement all necessary modifications in hardware /software and carry out periodic version upgrades and updates to the hardware and software during the entire project duration (installation, warranty ,AMC etc) to ascertain the compliance of the system with the specifications and requirements of customers, DISCOMs and regulatory authorities.

3.17) The System Integrator shall impart periodic training /refresher to the ITI /Customers technical staff free of cost during the entire project duration. The required documentation in soft copies shall be made available.

3.18) The system Integrator shall provide a model facility at ITI or at the system Integrators premises in order to test the interoperability of meters manufactured by ITI.

3.19) ITI along with the selected System Integrator shall bid as a Consortium and jointly prepare the tender bid documents for the technical and commercial compliances . Both ITI and the selected partner shall mutually discuss and work out the best bidding strategy for winning the tender . Also in the case of counter offers given by customer, both ITI and partner shall make all efforts to match the prices for providing supply and services as per the terms and conditions of the purchase order.

3.20) The selected System Integrator has to sign a memorandum of understanding(MoU) and Non Disclosure Agreement(NDA) in line with EoI terms and conditions within 15 days of award of Letter of Selection. MoU will be valid for three years and shall be extended on mutual discussions.

4) Specification & requirements

4.1) The core components of AMI system are

a. Smart Energy meters (Single phase, Three phase, LT-CT) supporting various communication interfaces such as GPRS (2G/3G/4G/5G in future), RF mesh, Hybrid solution of RF and GPRS(2G/3G/4G/5G in future), NB-IoT or any other as required

b. Communication Infrastructure

c. Head End System (HES)

d. Meter Data Management System (MDMS)

e. Web application with online data of consumers

f. Mobile application (specification & requirement given by DISCOM/customer)

g. Business Intelligence and Data Analytics Software

h. Cloud infrastructure

4.2) The AMI system must comply with the laws and regulations as outlined in Functionality requirement document released by Central Electricity Authority (CEA) and their latest amendments placed as Annexure-I (URL Link - http://www.cea.nic.in/reports/others/god/dpd/ami_func_req.pdf).

4.3) The selected System Integrator need to ensure that the AMI solution support the required Communication infrastructure as per customer requirement (GPRS (2G/3G/4G/5G in future), RF mesh, Hybrid solution of RF and GPRS(2G/3G/4G/5G in future), NB-IoT or any other as required) and shall meet the latest technical specification and relevant standards as applicable, ensure compliance to the customer requirements.(Generic specification and requirements is attached as **Annexure I**, which is tentative and subject to change as per future customer requirements).

4.4) The bidder shall have required certifications for the AMI as per the requirement of end customers

5) Eligibility Criteria

5.1) The bidders must be a registered company in India as per the Company Act, 1956/2013/ or a Consortium of maximum 2 members having lead bidder as a company registered in India and operational since April 2018 .

Supporting documents

1. Certification of registration and Memorandum of Articles of Association of bidder/lead bidder, and

2. Consortium Agreement clearly highlighting the roles and responsibilities of lead bidder and consortium partner (in case of consortium)

5.2) The lead Bidder shall have an average annual turnover of minimum Rs. 125 Crores during the last 3 years (FY 2020-21, FY 2019-20, FY 2018-19) .

Supporting document : Audited Balance sheet for 3 years

5.3) The bidder should have a positive net worth in last 3 financial years.

Supporting document: Copy of audited statement of accounts duly certified by CA along with certificate stating the turnover and networth

5.4) The bidder/Consortium should have experience in the system integration and offering AMI solution for customers in India/worldwide. The bidder should have successfully implemented at least three AMI solution & system integration projects for any DISCOM /PSU in India during last five years having a cumulative customer base of 300000 meters.

Supporting document : Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from client for the work completed/ongoing with contact details

5.5) The bidder should provide an undertaking that the proposed communication solution has provision of interoperability and integration with at least 2 manufacturers of Smart meters.

Supporting document : Self declaration with details in company letter head signed by authorized signatory and integration certificate from the meter manufacturer

5.6) The bidder should submit an undertaking that the AMI solution is capable of transferring the data from meters to Head End System/Meter Data Management system and support IPv6/IPv4 Network addressing.. All the hardware /software required for this have to be part of the proposed AMI Solution

Supporting document : Self declaration with details in company letter head signed by authorized signatory.

5.7) The bidder should have experience in the MDMS and data analytics software and have implemented the same to at least three clients in the Indian power utility sector during last five years having a cumulative customer base of minimum 300000 meters.

Supporting document : Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from clients for the work completed/ongoing with contact details.

5.8) The System Integrator shall submit a Technical Solution document describing overall architecture and operational philosophy of the proposed AMI solution including the methodology for achieving communication requirements (GPRS (2G/3G/4G/5G in future), RF mesh, Hybrid solution of RF and GPRS(2G/3G/4G/5G in future), NB-IoT or any other as required) and different functionalities and also highlight additional features along with limitations if any.

Supporting document : Technical Solution document describing overall architecture and operational philosophy of the proposed AMI solution

5.9) Bidder (lead bidder or consortium member) should have valid ISO 9001:2015 and CMMI Level III (or above) certifications

Supporting document : Self attested Copy of ISO 9001:2015 and CMMI Level III (or above) certifications

5.10) The bidder & Consortium partner should not have been black-listed by Govt of India / any State Govt. or any entity controlled by them under any Central /State Govt Act/Rule as on the date of EoI submission.

Supporting document : Self declaration each by bidder & Consortium partner with details in company letter head signed by authorized signatory

5.11) A performance Bank Guarantee of Rupees five Lakhs (Rs. 500,000/-,returnable) is to be submitted by the bidder, on acceptance of selection as system integrator by ITI, in the form of Bank Guarantee from a Nationalized Bank for a claim period of 3 years plus three months from the date of signing of MoU. However, when a joint bidding will be done for a business opportunity and ITI consortium wins the opportunity, then the selected partner to provide the proportionate PBG of that opportunity for its share of work to ITI.

Supporting document : Undertaking in company letter head signed by authorized signatory.

5.12) The bidder should have at least 50 permanent resources in India/Abroad working in AMI division .

Supporting document : Self declaration with details of resources along with their qualification/experience in company letter head signed by authorized signatory.

5.13) The bidder shall submit a declaration confirming the clause-by-clause compliance to statement of this notice for EoI and a copy of this notice duly signed on all pages by the authorized representative of the bidder shall be enclosed as part of the proposal.

Supporting document : As above

5.14) Pursuant to Order No. F.No 6/18/2019-PPD dated 23-July-2020 from Department of Expenditure, Ministry of Finance, the bidder and Consortium member should be either of the following:

1. Not from a country which shares a land border with India, or

2. from a country which shares a land border with India and registered with competent authority in accordance with order mentioned above.

The definition of bidder from a country which shares a land border with India shall be as in Paragraph 8 of the above mentioned order. Further all the guidelines mentioned to this above order shall be applicable to this EoI. Bidder shall carefully go through the same and ensure its eligibility as per the said order.

Supporting Document : The bidder has to submit a declaration as per the format at Annexure-V

6) EOI Submission:

6.1) Interested bidders meeting the eligibility criteria as described in clause 5 and sub clauses, shall submit sealed EoI along with the supporting documents as mentioned in checklist of documents at Annexure-II along with a copy of check list. All documents shall be duly signed by the authorized signatory of the bidder.

6.2) EMD/Tender fee : - Bidders shall submit two demand drafts, one for an amount of Rs. 5,00,000/-(Rupees Five lakh only) towards Earnest Money Deposit (refundable) and another for an amount of Rs. 10,000/- (Rupees Ten thousand only) towards tender fee (not refundable) drawn in favor of ITI Limited, Payable at Palakkad from any nationalized/Scheduled Bank. The demand drafts shall be kept in a separate cover marked as "EMD & TENDER FEE" and submitted/sent along with the bid.

6.3) Bids not accompanied by the requisite amount of EMD and tender fee shall be considered irresponsive and will be rejected.

6.4) The Bid Security/EMD of unsuccessful Bidder(s) as per this EoI will be returned within 30 days after completion of the evaluation. The EMD of the selected bidder will be returned after the submission of a Performance Bank Guarantee as per clause 5.11.

6.5) The Bid Security/EMD may be forfeited in the following cases, without prejudice to its other rights or claims against the Bidder(s) under any other section of this document or provisions of law;

a) If after Bid opening the Bidder(s) withdraws the bid during the period of bid Validity or its extended period, if any; or

b) In case of selected bidder , if the Bidder:

1. Fails to sign the MoU agreement with ITI as per the terms and conditions of the EoI

or

2. Fails to furnish Performance Bank Guarantee for an amount equal to EMD within 15 day of Letter of Selection

c) During the bid process, if a Bidder indulges in any such deliberate act as would jeopardize or unnecessarily delay the process of bid evaluation and finalization.

d) During the bid process, if any information found wrong / manipulated / hidden in the bid.

The decision of ITI regarding forfeiture of the EMD and rejection of bid shall be final & shall not be called upon question under any circumstances.

6.6) Bidders may please send their proposals to the following address:

Deputy General Manager (TS & Mkt)
ITI Limited,
Kanjikode West, Palakkad - 678623
Ph: 0491-2568844
Mobile: 09497128550
Email: bindums_pkd@itiltd.co.in
Web Site: https://www.itipalakkad.in/
Corporate Web site: https://www.itiltd.in/

6.7) The last date for receiving the proposal is 26/07/2021 at 2.00 P.M. and will be opened on the same day at 2.30 P.M.

Note: In case the date of submission of bid is declared to be a holiday, the bid may be submitted by 2 PM on the next working day of ITI.

The bids with not having enclosures mentioned in clause 5 and sub clauses, Annexure II (check list of documents) and VII (Criteria for Technical Evaluation) of this EoI will be rejected.

6.8) The EoI shall be submitted as hard/ soft copy. In case of soft copy, the bid document including scanned copy of EMD and tender fee to be sent through E-mail to reach before the deadline and one set of hard copy (spiral bound with numbering) to be received within 6 days from the EOI due date. The bidder, submitting only hard copy, shall submit the same directly or by Speed Post /Courier to reach on or before the submission due date date/time. Proposals receiving alter the due date/time will be summarily rejected.

6.9) All queries about this EOI may be sent to the following Officer of ITI by post, or e-mail on or before the schedule specified

Deputy General Manager (TS & Mkt)
ITI Limited,
Kanjikode West, Palakkad - 678623
Ph: 0491-2568844
Mobile: 09497128550
Email: bindums_pkd@itiltd.co.in
Web Site: https://www.itipalakkad.in/
Corporate Web site: https://www.itiltd.in/

6.10) The preferred mode of delivering questions is through e-mail. Telephonic responses, if sought for, shall not be treated as valid responses. The queries by the applicants shall be raised in following :-

Sl. NO.	Page No.	Clause of The EOI	Clarification needed

6.11) After distribution of the EOI, the contact person notified by ITI will begin accepting written questions from the applicants. ITI will endeavor to provide timely response to all queries. However, ITI makes no representation or warranty as to the completeness or accuracy of any response made in good faith, nor does ITI undertake to answer all the queries that have been posed by the applicants. The responses to the queries from all Applicants will be posted online on www.itiltd-india.com.

6.12) At any time prior to the last date for receipt of EOI, ITI may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the EoI notice by a corrigendum.

6.13) Any such corrigendum will be published by ITI only online at www.itiltd-india.com and https://eprocure.gov.in/cppp/

6.14) In order to provide prospective bidders reasonable time for taking the corrigendum into account, ITI may, at its discretion, extend the last date for the receipt of EoI proposals which shall again be notified online through ITI portal www.itiltd-india.com and https://eprocure.gov.in/cppp/

7) Other terms and conditions:

7.1) Period of Validity of offers: The offer shall remain valid for a period of at least 180 days from the due date of offer submission. Offers valid for a shorter period shall be rejected.

7.2) Language of offers: The offers prepared by the bidder and all the correspondences and documents relating to the offers exchanged by the bidder, shall be written in the English language.

7.3) Cost of EOI: The bidder shall bear all costs associated with the preparation and submission of its EOI, including cost of presentation for the purposes of clarification of the offer, if so desired by ITI. ITI will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the EOI process.

7.4) The Bidder shall be ready to give clarifications on any part of the offer to ITI.

7.5) Amendment of EOI: At any time prior to the last date for receipt of offers, ITI may, for any reason whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the EOI document by an amendment. In order to provide prospective bidder reasonable time in which to take the amendment into account in preparing their offers, ITI may, at their discretion, extend the last date for the receipt of offers and/or make other changes in the requirements set out in the invitation for EOI.

7.6) Disclaimer: ITI and/or its officers, employees disclaim all liability from any loss or damage, whether foreseeable or not, suffered by any person acting on or refraining from acting because of any information including statements, information, forecasts, estimates or projections contained in this document or conduct ancillary to it whether or not the loss or damage arises in connection with any omission, negligence, default, lack of care or misrepresentation on the part of ITI and/or any of its officers, employees.

7.7) The following documents shall be submitted by the bidder along with the EoI

a) Profile of the bidder with Name and address of the Bidder and contact details:
b) Copies of all other statutory registration certificates including PAN, GST, CIN etc.,
c) Signed copy of this EoI document with signature on each pages.
d) Signed Integrity Pact (copy of which is enclosed at Annexure IV).
e) The power of attorney to sign the bid documents. All certificates and documents received as part of the offer shall be signed by the Authorized Representative (signing is not mandatory for technical manuals or similar documentation).
f) All required documents , certificates and self declarations as mentioned in the criteria for technical evaluation (Annexure-VII)
g) The check list of documents provided as per Annexure-II

8) Scrutiny, Evaluation of EoI, and Selection

8.1) The bidder shall submit the bid, based on the eligibility requirements as mentioned in clause 5 and sub clauses and bid shall include all the supporting documents as mentioned in Annexure-II (Check list of Documents) of this EOI. The proposal of the bidders who is not having the eligibility criteria as per the clause 5 and sub clauses will not be considered for further evaluation.

8.2) ITI will constitute an Evaluation Committee to evaluate the responses of the applicants. The Evaluation Committee shall evaluate the responses to this notice and all supporting documents & documentary evidence.

8.3) The bidders will be evaluated based on the Evaluation criteria mentioned in Annexure VII (Criteria for technical Evaluation) of this EOI. The bidders shall ensure to provide complete information required as per the criteria for technical evaluation.

8.4) The bidder who meets the eligibility criteria needs to make a comprehensive presentation of the proposed AMI solution as per the submitted bid document. The committee may seek additional documents & clarifications deemed necessary.

8.5) The prospective bidder who score maximum marks out of 70 marks as per the evaluation criteria will be selected as the System Integration Partner for ITI.

8.6) The decision of the Evaluation Committee shall be final. No correspondence will be entertained from outside during the evaluation process by the Committee.

8.7) Bidder who is willing to have exclusive tie up with ITI shall be given preference during evaluation.

8.8) Right to accept or reject any or all EoIs:

a) Notwithstanding anything contained in this notice, ITI reserves the right to accept or reject any bid and to annul the EoI process and reject Proposals of all bidders, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons thereof. In the event that ITI rejects or annuls all the bids, it may, at its discretion, invite all eligible original bidders to submit fresh EoI.

b) ITI reserves the right to disqualify any bidder during or after completion of EoI process, if it is found there was a material misrepresentation by any such bidder or the bidder fails to provide, within the specified time, supplemental information sought by ITI.

c) ITI reserves the right to verify all statements, information and documents submitted by the bidder in the EoI. Any such verification or lack of such verification by ITI shall not relieve the bidder of his obligations or liabilities hereunder nor will it affect any rights of ITI.

d) In case of any additional details/documents required as part of evaluation, ITI shall seek the details through written/E-mail communication and the bidder has to submit the same within the scheduled date.

ANNEXURE-I

TECHNICAL SPECIFICATION

Scope of Work: Design, supply, installation & Commission and maintenance of end to end AMIsolution: -

Core Components of AMI System:
Following core components of AMI shall be provided:

- Smart Meters
- Communication Infrastructure and Network Management System (NMS)
- Head End System (HES)
- Meter Data Management System (MDM)
- Cloud Service,

Technical specification of Smart Energy Meters

Smart Meters: Single Phase 2 Wire, whole current Smart Energy Meter including pluggable GPRS communication module as per IS :16444 Part-1, Accuracy Class 1.0, etc., Current Rating 5-30 A , 10-60 A, 10-100 A etc.,With Backlit LCD Display, Net metering facility, default post paid facility with prepaid facility built-in.

Three Phase, 4Wire, whole current Smart Energy Meter including pluggable GPRS communication module as per IS :16444 Part-1, Accuracy Class 1.0, etc., Current Rating 10-60 A, etc., With Backlit LCD Display, Net metering facility, default post paid facility with prepaid facility built-in.

LT–CT operated, Three Phase, Smart Energy Meter including pluggable GPRS communication module as per IS :16444 Part-2, Accuracy Class 0.5s, Current Rating -/5 A, etc.,With Backlit LCD Display, Net metering facility, default post paid facility with prepaid facility built-in.

BIS CERTIFICATE:-
BIS Certified Smart Energy meters.

STANDARDS APPLICABLE:-
Unless specified elsewhere in this specification, the performance & testing of the meters should conform to the following Indian/International standards, to be read with up to date and latest amendments/revisions thereof as on 90 days prior to floating of tender.

Sl.No	Standard No	Tit le
1.	IS 13779, 1999 read with its latest Amendments	Specification of AC Static Watt hour meters class 1.0 and2.0
2.	IS 15959 part 2, IS 16444 part1 Smart meter standards	Data exchange for electricity Meter reading, Tariff and Load Control – Indian Companion Specification CategoryC3 meters

3.	CBIP Research Publication No.325 read with latest amendments	Specification for AC Static Electrical Energy Meters
4.	IS 12346 (1999)	Specification for testing equipment for A.C. Static Electrical Energy Meter (latest amendment).
5.	C.E.A. Regulation No. 502 / 70 / CEA / DP&D dt	Central Electricity Authority (Installation and Operation ofMeters) Regulation, 2006.
	17/03/2006 with all amendments	
6.	IS 14434 (1998)	Polycarbonate Moulding and Extrusion Materials.
7.	IS-15884	AC circuit connected Static Smart prepaid Meters for Active Energy (Class 1 and Class 2)
8.	IS-16444	A.C. Static direct connected watt-hour smart meter
9.	IS-16444 and CEA guideline	Power On-Off event.
10.	CEA document August 2016	Functional specifications and functional requirements of AMI

NETWORK MANAGEMENT SYSTEM (NMS): Suitable Network Management System (NMS)shall be deployed to monitor the network's status from end-to-end and the status of each and every device (RF/ GPRS signal strength, dynamic status of links with colour-codes, throughput, available bandwidth etc. in the network in real-time, and provide performance and activity statistics. The network management software shall be based on the latest secured version of Simple Network Management Protocol ver. 3.0 (SNMPv3). The NMS system shall have a simple browser-based user interface to provide all the pertinent information about the system. The NMS shall not impact the availability and performance of AMI applications and shall load not more than 3% of any host CPU, 1% of network bandwidth and shall have secure communication.

Head End System (HES): The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters. HES also shall serveas the control and monitoring hub for sending commands to end points individually/ in defined groups or across the entire network. The HES shall provide the means to monitor the network's statusfrom end-to-end and the status of each and every device (signal strength, dynamic status of links with colour-codes, throughput, available bandwidth etc.) in the network in real-time, and provide performance and activity statistics.

Meter Data Management System (MDM): The Meter Data Management System shall support storage, archiving, retrieval & analysis of meter data and various other MIS along with validation &verification algorithms. It shall act as a central data repository. MDM shall have capability to importraw or validated data in defined formats and export the processed and validated data to various othersystems sources and services in the agreed format. It shall provide validated data for upstream systems such as billing, consumer Information system, customer care, analytics, reporting, Networkplanning & analysis, load analysis/forecasting, Peak Load Management, Outage management etc

Cloud Infrastructure: Secure cloud based web hosting with uninterrupted services on 24x365 days basis will have to be provided. The vendor must host the system in security standard MeitY empanelled ISO 27001 certified minimum Tier-3 Data Centre within INDIA.

List of design specification:

IS Standards :

1. IS 16444 Part-1 & Part-2 with latest amendments
2. IS 15959 Part-2 with latest amendments
3. IS 13779 with latest amendments
4. IS 15884 with latest amendments
5. AMI Smart Energy Meters Functional requirements-CEA (1 Ph & 3 Ph)

Additional specifications :

1. Special Anti tamper features for Haryana _1Ph and 3 Ph
2. Meter sealing specification UP and Haryana
3. EESL Specification standardization (Display Parameters and Sequence, Error Codes on Meter Display, Labeling Format for Meter Serial Number, LED Indications on NIC, Tamper Events and Thresholds, Tests and Checklist for PDI).
4. EESL Technical specification for Meter Box
5. Standard Communication module specification.
6. Any other solution as per various RFP/ Tender.

Functional Requirements of

Advanced Metering Infrastructure (AMI)

In

India

CENTRAL ELECTRICITY AUTHORITY

August, 2016

1. Functional Requirements for Advanced Metering Infrastructure (AMI)

These functional requirements define the minimum functionalities and performance for AMI system proposed to be developed in India. The main objective of AMI is to enable two way communication between smart energy meter and Head End System(HES) to enable remote reading, monitoring & control of electrical energy meters (consumer, feeder, DT meters etc.) to serve as repository of record for all raw, validated and edited data. The sanitized data may be subscribed by other utility function for higher order analysis and billing and collection engine etc.

2. Basic Functions of AMI

The AMI system shall help utility to manage their resource and business process efficiently. AMI system shall support the following minimum functionalities:

a) Remote Meter data reading at configurable intervals(push/pull)

b) Time of day (TOD)/TOU metering

c) Pre paid functionality

d) Net Metering/Billing

e) Alarm/Event detection, notification and reporting

f) Remote Load Limiter and connection/ disconnection at defined/on demand conditions

g) Remote firmware upgrade

h) Integration with other existing systems like IVRS, Billing & collection software, GIS mapping, consumer indexing, new connections & disconnection, analysis software, Outage Management System etc.

i) Import of legacy data from existing modules/ MDAS of RAPDRP where ever possible. The extent and modalities of integration with the existing system including RAPDRP has to be worked out by the bidder.

j) Security features to prevent unauthorized access to the AMI including Smart meter & meter data etc. and to ensure authentication of all AMI elements by third party.

This is only an indicative but not exhaustive list. The system should be capable to support the other functionalities as per the requirement of utilities.

The System should accurately maintain system time synchronization across all devices to ensure accuracy of data. The system should support the interfacing with the future Smart Grid functionalities like outage management system, distribution automation including self-healing system, distribution transformer monitoring units, Electric vehicle, distributed energy resources etc. The communication network shall preferably be able to support multiple applications.

The Bidder shall submit an approach paper describing overall architecture and operational philosophy of the proposed AMI solution and methodology for achieving different functionalities, specified in this document and also highlight additional features, if any.

3. General AMI System Requirement

Smart Meter (Single phase whole current, Three phase whole current, CT & PT operated three phase meters and CT operated three phase meters) for consumers/ system shall be provided based on Radio Frequency (RF) mesh in license free frequency band/ Power Line Carrier Communication (PLCC) or GPRS/3G/4G communication technology or combination of these technologies as per the site requirement and to ensure the performance level given in this document. The smart meter data using RF mesh/PLCC shall be collected by Data Concentrator Units(DCUs)/Access point and transported to HES through WAN while the data from smart meters using GPRS/3G/4G technology shall be transported directly to HES through WAN. The AMI Implementing Agency (AIA) shall be responsible for proper data exchange among Smart meter, DCU, MDM, HES and other operational/requisite software as part of fully functional AMI system.

AIA shall adhere with the appropriate security algorithm for encryption and decryption. For smooth functioning of the entire system, it is essential that the details of such algorithm including the mechanism of security key generation be kept in a secured escrow account which shall be used by the utility only in case of termination of the contract for reasons whatsoever.

AIA may design appropriate architecture for providing end to end metering solution. AIA is free to decide upon the best solution out of all the available options. However, the entire responsibility of fully functional AMI system shall rest with one agency i.e. AIA in order to meet the performance levels as given in this document. The communication provider may adopt Radio Frequency (RF) mesh in license free frequency band/ Power Line Carrier Communication (PLCC) or GPRS/3G/4G communication technology or RF based canopy system or a combination of these technologies as per the site requirement adopting best available technology in the proposed area of implementation.

The following core components of AMI system shall be provided:

a) Smart Meters

b) Communication infrastructure

c) Head End System(HES)

d) Meter Data Management System (MDM)

e) Web application with updated on-line data of consumers etc.

f) Mobile app: AMI Implementing Agency (AIA) shall provide a mobile app through which consumer shall be able to log in through android/iOS/Window based mobile app to see information related to his/her energy consumption. App shall also provide platform for implementation of peak load management functionality by providing existing tariff & incentives rates, participation options etc. This mobile

app shall be part of complete system and therefore no additional cost shall be payable for upgradation / maintenance separately.

4. Smart Meters (Single phase & Three phase)

- Single Phase & Three Phase whole current smart meters shall comply with the enclosed Technical Specifications. Three Phase CT operated meter shall comply IS 14697 till the relevant IS for CT operated smart meters is available. The supplier / manufacturer would furnish valid BIS certification before supply of meters.

- The Smart meter installation shall be done by the AMI Implementing Agency (AIA) as per the rules and regulations and practices of Utility.

After meter installation, customer identification no., meter ID, its hardware & software configuration, name plate details, make, type i.e. 1 Phase or 3 Phase, etc.(as per requirement of utility) shall be updated in DCU/HES/MDM. The information would also be updated on the portal/app for providing information to consumers.

5. Communication infrastructure

The communication infrastructure should either be based on RF mesh network / PLC or cellular network or a combination of these. The communication network shall be based on suitable standards from ITU/IEC/IEEE/CEN/ CENELEC/ ETSI for NAN and WAN network. Communication network shall provide reliable medium for two-way communication between various nodes (smart meter) & HES. RF based network should use license free frequency band available in India. The engagement of network service provider would be in the scope of AMI Implementing Agency to meet the performance level as given in the document.

5.1. General Requirement

The AMI Implementing Agency (AIA) 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 AIA 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 AMI Implementing Agency (AIA) 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 AMI Implementing Agency (AIA). The operational testing of all the network elements has to be demonstrated by the bidder to the satisfaction of the utility.

The network solution offered by the bidder should have disaster recovery mechanism in place. The redundancy mechanism of HES and MDM and their disaster recovery plan shall also be described by the Bidder.

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 AMI system shall be the provided by the utility free of cost.

A suitable network management system (NMS) shall be provided to monitor the performance of the communication network round the clock. The NMS shall provide viewing of all the networking elements deployed at site and enable configuration & parameterization of the networking devices and the nodes.

5.2 Network Security

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

- **Secure Access Controls:** The system shall include mechanisms for defining and controlling user access to the operating system environment and applications. Best practices from enterprise security including password strength, password aging, password history, reuse prevention etc. must be followed for access control.
- **Authorization Controls:** A least-privilege concept such that users are only allowed to use or access functions for which they have been given authorization shall be available.
- **Logging:** Logs must be maintained for all attempts to log on (both successful and unsuccessful), any privilege change requests (both successful and unsuccessful), user actions affecting security (such as password changes), attempts to perform actions not authorized by the authorization controls, all configuration changes etc. Additionally, the access to such logs must be controlled in accordance to the least-privilege concept mentioned above, so that entries may not be deleted, accidentally or maliciously.
- **Hardening:** All unnecessary packages must be removed and/or disabled from the system. Additionally, all unused operating system services and unused networking ports must be disabled or blocked. Only secure maintenance access shall be permitted and all known insecure protocols shall be disabled.
- **Malicious Software Prevention:** Implementation of anti-virus software and other malicious software prevention tools shall be supported for all applications, servers, data bases etc.
- **Network Security:** The network architecture of the HES must be secure with support for firewalls and encryption. The system shall also allow host-based firewalls to be configured, as an additional layer of security if the network firewall were to fail.

5.3. Communication Network Elements (DCU based or Router Based):

5.3.1. Data Concentrator Unit (DCU) based Communication Network

The Data Concentrator Unit is a gateway for communication of data between the Smart Meters and the HES. The Data Concentrator Unit receives information from the Smart Meter on a scheduled / need basis and stores the data, which can be accessed by HES for onward transfer to MDM.

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

If communication system is DCU based RF network, then following requirement shall be met.

5.3.1.1 Hardware & Power Supply of DCU

- Enclosure/box of DCU shall be minimum IP55 or better compliant. A suitable mounting arrangement required for DCU installation shall also be provided.
- A suitable and optimum power supply shall be provided keeping in view that even in case of outage in one or two phases, DCU can be powered. DCU should be capable of withstanding surges & voltage spikes of 6KV as per IEC 61000-4-5 standards. Power supply shall be terminated on suitable sized MCB to facilitate isolation during on-site maintenance.
- DCU shall have battery with backup for 1 hour for normal meter reading, to push tamper event, carry out on demand reading and the network health status / connectivity continuity & check. DCU should have the suitable feature to send power outage and restoration message to the HES. The battery shall have a guaranteed life of 10 years.
- DCU shall have built in Real Time Clock (RTC) with separate battery backup. The battery shall have a guaranteed life of 10 years. It shall have self-diagnostic feature for RTC, memory, battery, communication module, etc. Alternatively, Software driven RTC may also be used as per agreement between supplier and utility.

5.3.1.2 Configuration, Functionality & Interface of DCU

DCU shall have following configuration functionalities:

- It shall be able to configure the communication with underlying nodes/meters.
- It shall pull data from the field devices and push the data at configured intervals to the HES. It should also support the HES in pulling data from the field devises/meters. The data acquisition (Push/Pull) frequency shall be programmable. DCU shall be capable to prioritize control commands.
- DCU shall ensure a secure communication to HES and shall have internal memory for storing interval data for at least 5 days.
- DCU shall support on demand read and ping of individual/group of meters.

- It shall support IPv4 / IPv6 network addressing.
- DCU shall push events like tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters.
- The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP-55). A suitable mounting provision shall be made for the equipment.
- Enclosure: Provision for security sealing shall be provided and in case the gasket of the cover is used for protection against moisture, dust and insects, the gasket shall be made of weather and aging resistant material.
- The list of standards followed in all the devices/equipment used in communication network shall be furnished

5.3.1.3 DCU Communication

- The communication architecture shall be any, as defined under IS 16444.
- The DCU shall ensure the appropriate backhaul for secure transfer of data to HES. In case of GPRS/3G/4G backhaul, it shall support SIM card from any service provider. It shall have Wide Area Network (WAN) connectivity to the HES through suitable means.
- DCU shall be able to communicate with meters either on RF mesh (license free band) or PLC.
- DCU shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads.
- It shall push events like tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters. DCU shall be able to acquire and send data to HES for full capacity (as per designed for no. of meters/field devices) to ensure the performance level. Full capacity of DCU is required to be indicated in the offer.
- After Power Interruption, on restoration of power supply, DCU shall establish communication with underlying devices as well as upstream application automatically.
- DCU shall be able to communicate with the nearest meters depending on topographical features. For further communication among the meters, distance of the other meters with the DCU shall not be a constraint as communication of the nearest meters shall be established with other meters through appropriate mesh formation / other formation.
- Remote Firmware Upgrade: The DCU shall support remote firmware upgrades as well as remote configuration from the control center. Configuration of programmable parameters of smart meters shall be done through HES.

- All meters falling under one DCU shall be commissioned and checked for proper communication in presence of utility in-charge.

- DCU shall keep the records of minimum of the following events:

  - No of packet failures
  - Retry attempts
  - Missed periodic readings
  - Failure to connect
  - Tamper events

5.3.2 Router based RF Mesh Network

If communication system is router based RF mesh network, then following requirement shall be met. In this type of communication network, different nodes (smart meters) shall interconnect with each other using RF mesh network and they shall communicate with nearby routers to transfer the data to access points. In such communication network, if any routers/repeaters/access points fail, then nodes connected on that device shall automatically reconfigure the mesh with available nearby nodes.

5.3.2.1 General Requirement of Router based RF Mesh Network:

The general requirements for the Router based RF network are specified below:

i) The communication network shall have dynamic & self-healing capability. If one of the communication element like router or access point fails then nodes connecting to that element shall switch to best available element for communication of data to HES.

ii) It shall support IPv4 / IPv6 network addressing.

iii) Each node shall keep a track of best available nearby nodes.

iv) The communication network equipment shall use licence free frequency spectrum as defined by Government of India.

v) All the communication network equipment shall be certified by WPC, Government of India for operation in licence free frequency band.

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

vii) It shall support remote firmware upgrading

viii) It shall be secure enough to avoid all cyber threats like DDoS, spoofing, malwares etc.

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

x) The equipment shall be weatherproof, dustproof and constructed for outdoor installation on poles (minimum rating: IP-55). A suitable mounting provision shall be made for the equipment.

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

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

xiii) Routers / Access Points shall have suitable power supply arrangements. Provision of battery backup for at least 1 hour shall be there to continue operation in case of power supply failure. The life expectancy of battery shall be 5 years or more.

5.3.2.2 Configuration, Functionality & Interface

Access points shall have following configuration functionalities:

- It shall be able to configure the communication with underlying nodes/end points.
- It shall support on demand read and ping of individual/group of meters.
- It shall push events like tamper, power off etc. to HES immediately on occurrence/receipt from field devices/meters.
- It shall have Wide Area Network (WAN) connectivity to the HES through suitable means.
- It shall communicate with routers/nodes/end points on RF mesh (license free band).
- It shall periodically monitor meter reads/downstream commands and shall retry and reconnect in case of failed events/reads.
- After power Interruption, on restoration of power supply, it shall establish communication with underlying devices as well as upstream application (HES) automatically.
- Access point shall facilitate recording of
  - No of packet failures
  - Retry attempts
  - Missed periodic reading
  - Failure to connect
  - Tamper events
- It shall be capable to handle interval data of suitable nos. of any type of smart meter (1ph/3ph). Access point shall be able to acquire and send data to HES for full capacity (No. of meters/field devices it is designed for) within a suitable time period to achieve the performance level. Full capacity of access point is required to be indicated in the offer.
- Access point shall support remote firmware upgrades as well as remote configuration from the control center.

5.3.3 Testing of the DCU /Access Point

DCU/Access Point shall be tested for the following:

- Radio interference measurement (CIS PR 22)
- Surge test (IEC 610004-5)
- Fast transient burst test (IEC 61000-4-4)
- Test of immunity to electrostatic discharges (IEC 61000-4-2)
- Test of immunity to electromagnetic HF field (IEC 61000-4-3)
- Resistance to heat and fire

The bidder shall provide IP-55 compliance test certificate for DUC/Access Point.

6. Head End System (HES)

The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters.

The AMI Implementing Agency (AIA) shall provide the HES suitable to support the collection and storage of data as per performance level for a defined no. of smart meters with facility of future expansion as per the requirement of the utility.

(NOTE: The no of smart meters/future expansion may be provided by utility as per their requirement)

HES would perform all the requisite functions as per the defined functionalities of AMI and it is the responsibility of the AMI Implementing Agency (AIA)/ System Integrator to supply the requisite software and hardware to achieve the defined functionalities of AMI. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data.

HES shall be developed on open platform based on distributed architecture for scalability without degradation of the performance using additional hardware. HES shall support storage of raw meter data, alarms and alerts for minimum 3 days. Adequate data base and security features for storage of data at HES need to be ensured.

The suggested functions of HES (not exhaustive) may be :

- Acquisition of meter data on demand & at user selectable periodicity
- Two way communication with meter/ DCU
- Signals for connect & disconnect of switches present in end points like meter
- Audit trail and Event & Alarm Logging
- Encryption of data for secure communication
- Maintain time sync with DCU / meter
- Store raw data for defined duration

- Handling of Control signals / event messages on priority
- Setting of Smart meter configurable parameters
- Communication device status and history
- Network information in case more than one technology is deployed in field between the two devices
- Critical and non-critical reporting functionality. The suggestive critical events may be alarms and event log for meter events like tamper/power failures etc., if data is not received from DCU/Meter, if relay does not operate for connect / disconnect or there is communication link failure with DCU/Meter or network failure while non critical events may be retry attempts on communication failure, periodic reading missing and failure to connect etc.

6.1 Configuration

HES shall facilitate programming of following meter parameters:

- Load profile capture period
- Demand integration period
- Setting of parameters for time of day (TOD/TOU) billing
- Prepaid function
- Net metering
- Billing date
- Clock setting/time synchronization
- Load curtailment limit
- Event setting for connect/disconnect
- Number of auto reconnection attempt
- Time interval between auto reconnection attempt
- Lock out period for relay
- Remote firmware upgrade
- Password setting
- Push schedule
- Setting threshold limits for monitored parameters
- Provision for adding more programming features in future

(The AIA may suggest more parameters as per the requirement)

6.2. Integration

HES shall preferably interface with MDM on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968 or any other open standard. The solution shall be Service Oriented Architecture (SOA) enabled.

7. Meter Data Management System (MDM)

The Meter Data Management System shall support storage, archiving, retrieval & analysis of meter data and various other MIS along with validation & verification algorithms. It shall act as a central data repository. MDM shall have capability to import raw or validated data in defined formats and export the processed and validated data to various other systems sources and services in the agreed format. It shall provide validated data for upstream systems such as billing, consumer Information system, customer care, analytics, reporting, Network planning & analysis, load analysis/forecasting, Peak Load Management, Outage management etc.

MDM should also support the future requirement of utility and should support the integration of other smart grid functionalities like Distribution Transformer Health Monitoring system, self-healing system etc. as and when implemented by the utility.

The vendor shall specify and deliver an initial system that supports the collection and storage of data for meeting the performance level for the ***defined no of consumers/ smart meters*** **(The exact Number have to be defined by the utility as per no of consumers of city/town/village)** with facility of future expansion.

The MDM shall have the ability to selectively choose which data to be maintained and which to be purged or archived as per requirement of Utility (user selectable).

7.1. Functional Requirements

7.1.1 Asset Management

- The MDM shall maintain information and relationships between the current installed meter location (apartment, shop, industry/ address etc.), Consumer information (Name etc.), Consumer account no, Meter ID, Type of Meter (type of consumer, 1 phase/3phase, with or without relay, etc.), Meter configuration (Demand integration period, Load profile capture period etc.), GIS supplied information (longitude, latitude , connection with feeder/ transformer/ pole etc.) etc.
- The software should support tracking the status of meters and communication equipment from the date when they are installed in the field. The history of in-service asset location is maintained throughout the device life with start and end dates associated with each in-service location reference.
- Ability to report and log any damage / deterioration in the meter attributable to consumer /utility.

7.1.2 AMI Installation Support

- The MDM shall also support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDM shall generate exceptions for meter or modules not delivering the correct meter data after installation.

- The MDM shall provide a reconciliation report that identifies the meters that have been installed but not communicating for a designated (configurable) period. MDM shall generate reports on the number of meters installed in comparison to the number of meters successfully communicating.

7.1.3 Meter Data

- The MDM shall accept input, process, store, and analyze Meter data from HES and meter data collected through hand held meter reading instruments and manual meter reads. In case of manual reads, provision should be there to insert associated notes like assessed energy, etc.
- The MDM should accept input, process, store, and analyze non-billing meter data such voltage and power quality data (like under/over voltage etc) as they are available from AMI Head End Systems. The MDM should also support schedule and on-demand meter reads and pinging of meter energized states by authorized users and by other utility systems.

- The MDM shall provide storage of all collected Meter Data, events and alarm. It shall have capacity of storing 5 years data or more via archiving.

- Correctly track & resolve energy usage across meter changes with no loss of individual meter data.

- Provide complete history and audit trail for all data collected from meters including commands sent to meters and other devices for 30 days (configurable period).

- Execute on-demand read processes.

- Handle special metering configurations like net metering/multiple meters at same premises.

- The MDM shall have the ability to manage at a minimum 15 minute interval data.

- Data Integrity- AMI Implementing Agency (AIA) shall ensure data integrity checks on all metered data received from data collection systems.

7.1.4 Data Validation, Estimation, and Editing (VEE)

- The validation and estimation of metered data shall be based on standard estimation methods. The MDM should also support and maintain following data-

a. **Registered Read Data** including register reads, daily billing cycle, as well as derived billing determinants like TOU

b. **Interval Data** channels with variable intervals and variable units of measure

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

d. **Event data** storage of all collected event and alarm data from meters, network equipment, and MDMS itself

- MDM shall flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in the cumulative ("CUM") register reads
  - o CUM Decrements within a billing cycle (except net-metering)
  - o CUM reads increments more than configurable threshold
  - o Future or old read dates
  - o Number of digits exceeds number of meter dials
- MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Time of Use (TOU) register reads
  - o Register Decrements (except net-metering)
  - o Resets (to zero) (except net-metering)
  - o CUM reads increments more than configurable threshold
  - o Future or old read dates
  - o Erratic compared to CUM read (sum of TOU reads minus CUM read)
- MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Demand register reads
  - o Do not reset on cycle
  - o Do not reset coincident with customer move-out or move-in
  - o Reset off cycle inappropriately
  - o Too high
- All data shall be transferred to billing system after meter data validation and estimation including transformer / feeder station wise energy audit.
- MDM shall estimate usage for non-metered service points such as street lights, farm lights, traffic signals, etc.
- The MDM shall maintain both the original received raw data in a non-manipulated state, in addition to VEE data.
- Notwithstanding the latency of data collection via the AMI system, once the MDM receives meter read data, the VEE process occurs in real-time and the post-VEE data is then immediately available to user or external systems.
- The MDM shall be able to automatically flag data changes from manual edits, VEE (Validating, Editing and Estimating) rules and data source corrections and electronically generate audit trail with timestamps and user-ids.

7.1.5 Billing Determinants Calculations

The MDM-

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

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

o Total Consumption

o Consumption in different time blocks for ToU billing

o Maximum Demand (in kW and kVA)

o Number of tamper counts

o Average power factor

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

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

- Shall have the ability to properly account for special situations including, but not limited to, curtailment requests, demand response scenarios when calculating billing determinants and sending them to billing software.

7.1.6 Exception Management

- Ability to capture and log data exceptions, problems and failures and to generate management reports, provide trend analysis, automate generation of service requests and track corrective actions.

- Ability to group, prioritize, filter and send system generated alarms and events to predetermined email addresses, cellular text messages to phone numbers/SMS/customer care etc.

- Exception Generation - MDM shall generate exceptions based on configurable business rules including but not limited to the following:

- Meter tamper alerts

- Communication module health alerts for Meter/DCU

- If the consumption is less/more than pre-defined average consumption

- Negative Consumption (not for net-metering)

- Power outage indications received from the Smart meter

7.1.7 Service Orders

- The MDM shall generate service orders based on configurable rules for various events and alarms such as stop meter, tampers, problem in communication networks, AMI host server, etc.
- MDM shall send service orders via SMS, email, etc. with the email addresses / phone numbers being configurable. MDM shall receive feedback on action taken on the service order and track the status of service orders.

7.1.8 Customer Service Support

- The solution shall provide customers with access to current and historical consumption and interval data, outage flags, voltage and power quality indications. The data shall be displayed in graphical and tabular form depending on user choice. The Customer may also access data through customer portal. The solution shall integrate via a user friendly graphical interface.
- MDM shall support email/SMS notification of configured alarms & events to selected users.
- The MDM shall support the web portal or shall have the ability to interface with the 3rd party portal/utility portal to provide the consumer near real time online views of both usage and cost and helping consumers to understand electricity usage and cost information, alerts and notifications and energy savings tips with different levels of detail. The portal should support the view for past electricity usage, last week's, yesterday's, current days or other period etc. as per selection. The portal should provide user friendly access to consumer for their data via colorful graphs and charts and can download the data into a spreadsheet.
- Shall support mobile app through which consumer shall be able to log in through android/iOS/Window based mobile app to see information related to his energy consumption. App shall also provide platform for implementation of peak load management functionality by providing existing tariff & incentives rates, participation options etc.

7.1.9 Analysis

The MDM shall have analysis capability based on configurable business rules including but not limited to the following:

- Display consumption/load profiles by configurable period (15/30 min, hour, day, month, year etc.) day type (weekday, weekend, holiday, festival wise etc.) and by tariff, customer type, or any user specified collection of meters.
- Generate peak & off-peak load patterns by aggregating all loads of DT/Feeder/consumer group.
- Perform DT/feeder wise energy audit.
- Perform load analysis for different groups and categories of consumers.
- Ability to provide the data to load forecasting, load research or demand response applications and perform error management like: Missed reads and

intermittent meter reads before taking into forecasting, load research or demand response

- Ability to configure the system to effectively visualize consumption trends, identify unusual patterns, and visualize load analysis to understand which assets are being over utilized.
- Analyzing data to identify new patterns of usage, Setting fraud alert / transformer overload alerts / demand – supply gap alert etc.
- Ability to receive and store outage and restoration event data from smart meters and outage systems and to log all such events for analysis.

7.1.10 Reporting

The solution shall include a list of the standard reports that are provided with the MDM including but not limited to following:

- Daily data collection report
- Usage exceptions
- VEE validation failures
- Missing interval Read date and times (on hourly, daily, weekly & monthly basis)
- Physical meter events (install, remove, connect, disconnect) & meter reset report
- Meter flags
- Meter inventory
- defective meters
- AMI performance measurements
- Threshold Exception

  The solution shall support users modifying standard reports to better meet specific reporting requirements.
- The MDM shall enable the Utility to deliver reports in standard digital format such as PDF, Excel, etc.
- Ability for GUI (Graphical User Interface) to set up or change report delivery to configurable email addresses, network file directories, ftp sites or printer systems without modifying source program code and without any proprietary language skills.
- All queries shall be generated through user driven drop down menu in GUI. The Bidder shall provide example queries to support internal report generation needs.
- Ability to provide daily & weekly interface exception reports between MDM and other subsystems e.g. billing, outage, etc.

- In case more than one technology of AMI (example PLC and RF between Smart Meter & DCU) deployed in the field The MDM shall generate report on the performance and availability of data being delivered per AMI technology.

7.1.11 Revenue Protection Support

- Ability to analyze meter tampering flags, power outages, usage trends and usage profiles to identify potential energy diversion situations, and produce daily reports, monthly reports and service order requests for investigation.
- The business rules for revenue protection alerts shall be configurable via a user-friendly interface.
- The MDM shall filter out revenue protection alerts that may be caused by field activities if the field activity information is provided to the MDM.
- The MDM shall support the analytics/investigation (i.e. view current and historical usage patterns) to valid suspected revenue protection issues.

7.1.12 Demand Control/Demand Response Support

Bidder shall describe how its MDM supports Smart Grid Demand Response programs involving Demand Response (DR) systems as part of PLM. The solution shall support the following analysis:

- Totaling the actual consumption during the DR event.
- Totaling the actual consumption of different groups that participated in the DR event.
- Comparing the actual to baseline consumption for the groups in above.
- The MDM shall support the tracking, monitoring and managing of Smart Meter and events, and monitors customer response to facilitate payment of customer incentives.

7.1.13 OMS/ other smart grid functionality support

MDM shall support Smart Grid OMS system as per the requirement of the utility. MDM shall support the interfacing with OMS software for providing AMI meter data needed for fault location identification and other requisite services like updating the data after attending the fault etc.

MDM should also support the interfacing of other smart grid functionalities like Distribution Transformer Health Monitoring system, self-healing system, electric vehicle etc. as and when implemented by the utility.

7.1.14. Additional Features

➢ **Net-Metering**

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

  - CUM decrements of forward energy within a billing cycle
  - Register decrements for Time of Use (ToU) of forward energy
  - Power generated(exported) by any net-metering consumer more than the installed capacity of solar PV rooftop system
  - Energy exported(exported) in any given day by any net-metering consumer more than the programmable threshold value

➢ **Prepaid functionality**

The prepaid functionality can either be availed at smart meter level or through MDM. In case of MDM, following shall apply

- The MDM should support pre-payment metering and capability to interface with pre-payment application.
- The prepayment should support the system that payment and connection parameters are stored centrally and the details are being updated to consumer portal/ app.
- The system should periodically monitor the energy consumption of prepaid consumer and decrease the available credit based on consumption.
- The system should send connect/disconnect command on the basis of available credit as per notified rules & regulations.
- The system should send low-credit notifications to the consumer when their balance approaches a threshold.

7.2 User Interface

The AMI Implementing Agency (AIA) shall provide user interface for the following:

Utility:

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

- Compare total energy costs on one rate schedule vs. one or many alternative rates.
- Enable the user to see how different options within a rate affect costs.
- Enable the user to see how adjusting load or consumption levels or shifting them to different time periods influences costs.
- Compare multiple facilities against each other based on costs, average spend, cost per area and cost by weather.

- Display meter data at a user defined configurable cycle through a GUI that allows authorized users to view energy usage patterns and the data behind them for selected customers.

- Allow authorized users to view metered data, initiate and view reports, modify configurations, and initiate and update service requests via a GUI.

- Display via a GUI the energy usage profile for a single meter or group of meters. The load profile shall illustrate energy consumption and peak demand in user defined intervals for a user-specified time period.

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

- Access to a minimum of 5 years of historical energy usage and meter reads through the GUI.

- GUI to clearly and visually distinguish between metered, estimated, allocated and substituted data.

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

  - Administrator
  - Operator
  - Field staff
  - Viewer/Guest

- Configure the look, feel, and functionality of the MDM in accordance with business needs, business processes, and business conventions. (e.g. GUI, content, look and feel of screens, validation rules, exception handling, etc.).

- Ability for utility through user interface to set up alarm and event notifications that can be directed to a combination of configurable email addresses, cellular text messages or phone numbers.

- User interface for utility to update the credit amount of prepaid consumers to MDM. Such type of user interface before login shall require password & login i.d. for authentication. User interface after getting information like consumer i.d., mobile number & recharge amount etc. shall update the same to MDM. The details of payment information shall also update to consumer through SMS, email etc.

Consumer:

User interface for all authorized consumers shall have ability for at least the following functionality:

- View metered data, initiate and view reports
- View data according to Time of Use(ToU) tariff
- Can make request for connection/disconnection
- User can update mobile number/email

- Can initiate service requests for maximum demand updating, meter checking etc.
- In case on net-metering consumers, user can view data for both import & export
- In case of prepaid consumers, consumers can view recharge history & present balance.
- Prepaid consumers shall be provided facility to recharge their account by logging on user interface. User interface shall require consumer id., mobile number & password for secure login. This user interface shall be integrated with the present online payment gateway of utility.

7.3 Integration with other Systems

MDM shall preferably interface with other systems on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968/IS15959/ Indian Companion Specification/ any other open standard. MDM solution shall be Service Oriented Architecture (SOA) enabled.

MDM integration with other systems shall include but not limited to the following:

- HES for data exchange from other AMI solutions
- Utility Administration
- Existing other Data Collection Systems
- IVR system, CRM, Consumer Portal
- Billing and collection system
- GIS Systems integration with CIS and with MDM system
- Support of interface with HHU or manual reading system etc.

AMI Implementing Agency(AIA) should provide suitable number of HHUs to read and update the data in MDM in case of any communication failure between meter and HES/MDM.

8. Performance Levels

(a) These performance levels shall apply to the complete AMI system.

(b) AMI system include the communications links provided by Network Provider /third parties such as telecommunications companies and AMI Implementing Agency (AIA) has to ensure the desired performance level.

(c) The performance levels are average performance levels over the period of a year and exclude force majeure events.

The following are the required performance levels -

- **Performance levels for collection of daily meter readings (as per IS 16444/15959 part 2)**

The following are the performance levels required for the daily collection of the previous day's interval energy data and total accumulated energy:

(1) All interval data from 95% of meters within 8 hours after midnight; and

(2) All interval data from 99.9% of meters within 24 hours after midnight.

- **Performance levels for remote reads of individual meters if data is not received on daily basis**

The performance level of an individual read applies to the collection of seven days of interval energy data and the current total accumulated energy from a particular AMI meter whose data is not being received on daily basis. The performance level required shall be:

(1) Action performed at 90% of meters within 1 Hour;

(2) Action performed at 99% of meters within 2 hours; and

(3) Action performed at 99.9% of meters within 6 hours.

- **Performance level for remote load control commands for selected consumers,**

The performance level required for individual meters shall be:

(1) Action performed at 95% of meters within 5 minutes;

(2) Action performed at 99% of meters within 10 Minutes

- **Performance level for remote connect/disconnect for selected consumers,**

The performance level required for selected individual meters shall be:

(1) Action performed at 90% of meters within 10 minutes;

(2) Action performed at 99% of meters within 1 hour; and

(3) Action performed 99.9% of meters within 2hours.

- **Performance levels for Meter loss of supply and outage detection**

Alarms to be received within 5 minutes for 90% of meters.

- **Performance levels for remotely altering settings in meter/ firmware upgrade**

The performance level required for individual meters shall be:

(1) Action performed at 99% of meters within 24 hours; and

(2) Action performed at 99.9% of meters within 36 hours.

- **Performance levels to remotely read events logs**

Performance level required for reading the full event log that pertains to an individual meter shall be:

(1) Action performed at 90% of meters within 30 minutes;

(2) Action performed at 99% of meters within 1 hour; and

(3) Action performed at 99.9% of meters within 6 hours.

To read the event logs pertaining to all meters:

(1) The data pertaining to 99.5% of meters with in 1 day;

- **Performance levels for updating of data on consumer portal/ app**

The performance level of updating of individual consumer data on portal/ app after receiving the data in MDM shall be:

(1) Action performed for 90% of consumers within 1 hour after receiving the data in MDM;
(2) Action performed at 99.5% of meters within 6 hours after receiving the data in MDM.

The performance level for generation of bills would be as per requirement of the utility. The performance levels regarding meter discovery time line after installation, on demand reading of meter data for operational purposes, outage restoration enquiry response time etc. would also be declared by the bidder.

Additionally, the Disaster Management timelines in terms of Recovery Time Objective (RTO) and Recovery Point Objective (RPO) of HES have to be defined by the bidder.

9. Performance Requirement for User Interface

The user interface performance testing shall be done as per following criteria-

S.No.	User Interface Requirements	Response Time
1	Any real time display and application display on workstation console along with data values shall appear on screen.	Within 2 sec
2	Manual data entry of the new value appears on screen.	Within 2 sec
3	Display Update rate	2 sec for 4 displays together
4	Response time for display of Alarm and event after receipt in system	Within 1 sec of receipt in system

5	Requests for printing of displays (to be acknowledged with an indication of request is being processed).	Within 2 sec
6	Requests for generation of reports (to be acknowledged with an indication of request is being processed).	Within 2 sec

10. Technical Obsolescence

The systems including communication technologies, which are at a risk of technical obsolescence over the next few years and over the operating life of the system should be identified and reported. This may also include end-of-sale and end-of-support policies governing the proposed technologies. The compatibility between the various elements of the system need to be considered and mitigation options, not be limited to periodic update from OEM/System supplier, shall be indicated in detail.

Technical Specification
of
Single phase whole current
Smart Meter

TECHNICAL SPECIFICATIONS FOR WHOLE CURRENT A.C. SINGLE PHASE TWO WIRE SMART ENERGY METER OF ACCURACY CLASS 1.0 WITH BI-DIRECTIONAL COMMUNICATION FACILITY SUITABLE FOR ADVANCED METERING INFRASTRUCTURE (AMI)

1. SCOPE

The specification covers the design, manufacturing, testing, supply and delivery of AC whole current 1 phase 2 wires Smart Energy Meter with bidirectional communication facility. The meter shall be suitable for Advanced Metering Infrastructure (AMI). The meter shall communicate with DCU/Access Point/ HES on any one of the communication technologies mentioned in IS16444, as per the requirement of the utility.

2. BASIC FEATURES

The Smart Meter would have the following minimum basic features-

- Measurement of electrical energy parameters
- Bidirectional Communication
- Integrated Load limiting switch
- Tamper event detection, recording and reporting
- Power event alarms such as loss of supply, low/ high voltage
- Remote firmware upgrade
- Net metering features
- On demand reading

3. GENERAL STANDARDS APPLICABLE FOR METERS

Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following standards with latest amendments thereof:

S. No.	Standard No.	Title
1	IS 13779 with latest amendments	AC Static Watt-hour Meter class 1& 2
2	IS 16444 with latest amendments	A.C. Static Direct Connected Watt Hour Smart Meter Class 1 and 2- Specification
3	IS 15884 with latest amendments	Alternating Current Direct Connected Static Prepayment Meters for Active Energy (Class 1 and 2)- Specification

4	IS 15959 Part 1 & Part 2 with latest amendments	Data Exchange for Electricity Meter Reading, Tariff and Load Control- Companion Standards

4. COMMUNICATION

Meter shall have ability to communicate with DCU/Access Point/HES on any one of the technologies mentioned in IS16444 in a secure manner, as per the site conditions and as per design requirement of AMI Implementing agency. In case of GPRS/3G/4G based meter, the meter shall accommodate SIM card of any service provider. In case of Plug in type communication module, the meter shall log communication module removal /non responsive event with snapshot.

4.1 Remote Load control facility would be as per IS 16444.

5. OTHER SPECIFICATIONS

Particulars	**Specification**
Applicable Standards	The meters shall comply with IS 16444 for all requirements. Those parameters which are not covered in IS 16444 have been specifically mentioned in this specification.
Reference Voltage	As per relevant IS
Current Rating	5-30 A/ 10-60 A (as per the requirement of the utility)
Starting Current	As per IS 16444
Accuracy	Class 1.0 as per IS 16444
Limits of error	As per IS 16444
Operating Temperature range	As per IS 16444
Humidity	As per IS 16444
Frequency	As per IS 16444
Influence Quantities	As per IS 16444
Power Consumption of meter	As per IS 16444
Current and Voltage Circuit	As per IS 16444
Running at No Load	As per IS 16444
Test output device	As per IS 16444
Meter Display	As per IS 16444
Name Plate & marking Meter Display	As per IS 16444
Parameters to be measured	As per IS 16444 / As per IS 15959 Part-2

Maximum Demand resetting	As per IS 15959 Part 2
Time of Use registers	As per IS 15959 part 2
Power Quality Information	As per IS 15959 part 2
LED/LCD Indicators	As per IS 16444
Load Survey/Interval Data	As per IS 15959 part 2
Tamper/ Event Recording	As per IS 15959 part 2
Measuring Elements	As per IS 16444
Alarm	As per IS 16444/ 15959 Part 2
Load Control	As per IS 16444
Connect/Disconnect and status of load switch	As per IS 16444
Programmability	As per IS 16444
Communication	As per IS 16444.
Communication Protocol	As per IS 16444
Remote Firmware upgrade	As per IS 15959 part 2
Real Time Clock(RTC)	As per IS 16444/ IS 15884 The clock day/date setting and synchronization shall only be possible through password/Key code command from one of the following: • From remote server through suitable communication network. • Hand Held Unit (HHU) or Meter testing work bench and this shall need password enabling for meter; (The methodology for the synchronization would be as per requirement of utility)
Data Retention	As per CEA regulations
Battery Backup	Meter shall be supplied with separate battery backup for RTC.

Guarantee	Manufacturer Shall undertake a guarantee to replace meter up to a period of 60 months from the date of supply. The meter which are found defective/inoperative within the guarantee period, these defective/inoperative meters shall be replaced within one month of receipt of report for such defective/inoperative meters
First Breath(power on) and Last gasp (power off) condition detection and communication to HES	As per IS 16444

5.1 DATA DISPLAY FACILITY (AUTO/MANUAL)

Data Display shall be in three modes-

1. Auto Scroll
2. Scroll with Push Button
3. High Resolution (Shall display energy values with resolution of 2 digits before decimal and 3 digits after decimal in push button mode)

The display order shall be:

- Auto Scroll
  - Cumulative Active Energy kWh along with legend.
  - Current calendar month MD in kW with legend.
  - Instantaneous voltage
  - Instantaneous current

These parameters should be displayed on the LCD/LED continuously for a period of 15 seconds on Auto scroll. In case of power failure, the meter should display above parameters with push button.

- Scroll with Push-button
  - Internal diagnostics
  - Cumulative kWh
  - Date
  - Real Time
  - Voltage in (V)
  - Current (I)
  - Power (kW)
  - Current month MD in kW
  - Last month cumulative kWh
  - Last month MD in kW
  - Last month MD occurrence Date

- Last month MD occurrence Time
- Meter Serial Number

The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds. (The order of display may be revised as per requirement of the utility)

6. ANTI TAMPER FEATURES

The meter shall continue recording energy under any tamper condition and would log the event and send alarm at Head End System after detection of the defined theft features as per IS 15959 Part 2.

(Optional test as per requirement of utility: The Meter shall be immune under external magnetic influences as per CBIP 325. Meter shall be tested for high voltage discharge (Spark) up to 35 KV as per CBIP 325.)

7. TESTS

7.1 Type Tests & Test Certificates

Smart meter shall be type tested for all the type tests as per IS: 16444 (latest version) in a third party independent lab. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444.

Necessary copies of test certificates shall be submitted as per agreement with the utility.

7.2 Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444. Apart from above test, meter shall be also be tested for all functional requirement through communication as part of acceptance test

8. GENERAL & CONSTRUCTIONAL REQUIREMENTS

8.1 Meter Shall be BIS marked as per IS 16444.

8.2 General & construction requirement shall be as per IS 16444/IS 13779

8.3 In Home Display (IHD) shall be optional and the specifications of the same would be as per agreement between the bidder and the utility.

9. METER BASE & COVER- Meter base & cover shall be as per IS 16444/ IS 13779. The meter Base & cover shall be break to open design. The material for meter base and cover shall be made of high grade polycarbonate.

10. **TERMINAL BLOCK & COVER** - As per IS 16444/IS 13779

11. DESIGN

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-16444 (latest version).

The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling.

12. CIRCUITRY - as per IS 16444

The supplier should submit the details of source/agencies from whom purchase of various components of meters used by them to the utility/purchaser.

13. NAME PLATE AND MARKING

The meter should bear a name plate clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, in the middle of the name plate the words “Name of the Utility”, purchase order no. & year/month of manufacturing shall either be punched or marked indelibly. The rating plate information shall be as per relevant IS.

14. CONNECTION DIAGRAM: As per IS 16444

15. FIXING ARRANGEMENTS:

The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover. The requisite fixing screws shall be supplied with each meter.

16. SEALING ARRANGEMENT:

Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of utility.

17. **METER BOX:** The Meter Box would be provided as per requirement of the utility/ purchaser.

18. PACKING

The meters shall be suitably packed for vertical/horizontal support to withstand handling during transportation. The meter shall be packed appropriately to ensure safe transportation, handling, identification and storage. All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter’s performance until its installation. The secondary packing shall provide protection during transportation. The packing case shall indicate “Fragile in nature” and

direction of placement of box. Each packing shall indicate marking details like Manufacturer's name, S.No. of meters, quantity etc.

19. TRANSPORTATION

The meter shall be compact in design. The meter block unit shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation. The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.

The meter should not be exposed to undue shock and mishandling during transportation. The stacking of box inside transport media should be such as to avoid their free movement. The packing should also be protected from rain and dust by transport media. The Bidder shall be responsible for any damage during transit due to inadequate or improper packing.

20. TESTING AND MANUFACTURING FACILITIES AT MANUFACTURER'S PLACE

The manufacturer shall have NABL accredited laboratory to ensure accurate testing calibration as per IS 13779 for acceptance test.

21. INSPECTION

❖ All meters shall be duly tested and sealed by the firm at their premises prior to inspection. Manufacturer seal may be provided on one side of meter. For the other side, the seal with engrave as Utility name may be sent in a pack for provision by utility after completion of test by the utility & after receipt of the meter.

❖ The utility/ purchaser may inspect the meter randomly as per sampling plan for acceptance test as per IS 16444. The meters shall be tested for all functional requirements as part of acceptance test as per IS 16444. After testing, these sample meters shall be additionally sealed and would be kept in safe lock for verification if needed.

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Technical Specification
of
Three phase whole current
Smart Meter

TECHNICAL SPECIFICATIONS FOR WHOLE CURRENT A.C. THREE PHASE FOUR WIRE SMART ENERGY METER OF ACCURACY CLASS 1.0 WITH Bi DIRECTIONAL COMMUNICATION FACILITY SUITABLE FOR ADVANCED METERING INFRASTRUCTURE (AMI)

1. SCOPE

The specification covers the design, manufacturing, testing, supply and delivery of AC whole current 3 phase 4 wires Smart Energy Meter with bidirectional communication facility. The meter shall be suitable for Advanced Metering Infrastructure (AMI). The meter shall communicate with Data Concentrator Unit (DCU) / Access Point / HES on any one of the communication technologies mentioned in IS16444, as per the requirement of the utility / authorized system integrator.

2. BASIC FEATURES

The Smart Meter would have the following minimum basic features-

- Measurement of electrical energy parameters
- Bidirectional Communication
- Integrated Load limiting switch /relay
- Tamper event detection, recording and reporting
- Power event alarms such as loss of supply, low/ high voltage
- Remote firmware upgrade
- Net metering features
- On demand reading

3. GENERAL STANDARDS APPLICABLE FOR METERS

Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following standards with latest amendments thereof:

S.No.	**Standard No.**	**Title**
1	IS 13779 with latest amendments	AC Static Watt-hour Meter class 1& 2
2	IS 16444 with latest amendments	A.C. Static Direct Connected Watt Hour Smart Meter Class 1 and 2- Specification
3	IS 15884 with latest amendments	Alternating Current Direct Connected Static Prepayment Meters for Active Energy (Class 1 and 2)- Specification

4	IS 15959 Part 1 & Part 2 with latest amendments	Data Exchange for Electricity Meter Reading, Tariff and Load Control- Companion Standards

4. COMMUNICATION

Meter shall have ability to communicate with Data Concentrator Unit (DCU) / Access Point / HES on any one of the technologies mentioned in IS16444 in a secure manner, as per the site conditions and as per design requirement of AMI Implementing agency. In case of GPRS/3G/4G based meter, the meter shall accommodate SIM card of any service provider. In case of Plug in type communication module, the meter shall log communication module removal/ non responsive event with snapshot.

4.1 Remote Load control facility would be as per IS 16444.

5. OTHER SPECIFICATIONS

Particulars	**Specification**
Applicable Standards	The meters shall comply with IS 16444 for all requirements. Those parameters which are not covered in IS 16444 have been specifically mentioned in this specification.
Reference Voltage	As per relevant IS
Current Rating	10-60 A /10-100 A (as per the requirement of the utility)
Starting Current	As per IS 16444
Accuracy	Class 1.0 as per IS 16444
Limits of error	As per IS 16444
Operating Temperature range	As per IS 16444
Humidity	As per IS 16444
Frequency	As per IS 16444
Influence Quantities	As per IS 16444
Power Consumption of meter	As per IS 16444
Current and Voltage Circuit	As per IS 16444
Running at No Load	As per IS 16444
Test output device	As per IS 16444
Meter Display	As per IS 16444
Name Plate & marking Meter Display	As per IS 16444
Parameters to be measured	As per IS 16444 / As per IS 15959 Part-2

Maximum Demand resetting	As per IS 15959 Part-2
Time of Use registers	As per IS 15959 Part-2
Power Quality Information	As per IS 15959 Part-2
LED/LCD Indicators	As per IS 16444
Load Survey/Interval Data	As per IS 15959 Part-2
Tamper/ Event Recording	As per IS 15959 Part-2
Measuring Elements	As per Is 16444
Alarm	As per IS 16444/ As per IS 15959 Part-2
Load Control	As per IS 16444
Connect/Disconnect and status of load switch	As per IS 16444
Programmability	As per IS 16444
Communication	As per IS 16444.
Communication Protocol	As per IS 16444
Remote Firmware upgrade	As per IS 15959 Part-2
Time Synchronization	As per IS 16444/IS 15884 The clock day/date setting and synchronization shall only be possible through password/Key code command from one of the following: • From remote server through suitable communication network. • Hand Held Unit (HHU) or Meter testing work bench and this shall need password enabling for meter; (The methodology for the synchronization would be as per requirement of utility)
Data Retention	As per CEA regulations
Battery Backup	Meter shall be supplied with separate battery backup for RTC.

Guarantee	Manufacturer Shall undertake a guarantee to replace meter up to a period of 60 months from the date of supply. The meter which are found defective/inoperative at the time installation or become inoperative/defective within the guarantee period, these defective/inoperative meters shall be replaced within one month of receipt of report for such defective/inoperative meters
First Breath(Power on) and Last gasp(Power off) condition detection and communication to HES	As per Is 16444

5.1 DATA DISPLAY FACILITY (AUTO/MANUAL)

Data Display shall be in three modes-

1. Auto Scroll
2. Scroll with Push Button
3. High Resolution (Shall display energy values with resolution of 2 digits before decimal and 3 digits after decimal in push button mode)

The display order shall be-

- Auto Scroll
  - Cumulative Active Energy kWh along with legend.
  - Cumulative Energy in kVAh with legend
  - Current calendar month MD in kW with legend.
  - Current calendar month MD in kVAh with legend
  - Instantaneous voltage V_{RN}
  - Instantaneous voltage V_{YN}
  - Instantaneous voltage V_{BN}
  - Instantaneous current I_R
  - Instantaneous current I_Y
  - Instantaneous current I_B

These parameters should be displayed on the LCD/LED continuously for a period of 15 seconds on Auto scroll. In case of power failure, the meter should display above parameters with push button.

- Scroll with Push-button
  - Internal diagnostics

- Cumulative kWh
- Cumulative kVAh
- Date
- Real Time
- Voltage V_{RN} (V)
- Voltage V_{YN} (V)
- Voltage V_{BN} (V)
- Current I_R (I)
- Current I_Y (I)
- Current I_B(I)
- Power (kW)
- Power (kVA)
- Current month MD in kW
- Current month MD in kVAh
- Last month cumulative kWh
- Last month cumulative kVAh
- Last month MD in kW & occurrence Date
- Last month MD in kVAh & occurrence Date
- Average power factor
- Meter Serial Number

The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds. (The order of display may be as per the requirement of utility)

6. ANTI TAMPER FEATURES

The meter shall continue recording energy under any temper condition and would log the event and send alarm at Head End System after detection of the defined theft features as per IS 15959 Part 2.

(Optional test as per requirement of utility: The Meter shall be immune under external magnetic influences as per CBIP 325. Meter shall be tested for high voltage discharge (Spark) up to 35KV as per CBIP 325)

7. TESTS

7.1 Type Tests & Test Certificates

Smart meter shall be type tested for all the type tests as per IS: 16444 (latest version) in a third party independent lab. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444.

Necessary copies of test certificates shall be submitted as per agreement with the utility.

7.2 Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444. Apart from above test, meter shall also be tested for all functional requirement through communication as part of acceptance test.

8. GENERAL & CONSTRUCTIONAL REQUIREMENTS

8.1 Meter Shall be BIS marked as per IS 16444.

8.2 General & construction requirement shall be as per IS 16444/IS 13779.

8.3 In Home Display(IHD) shall be optional and the specifications of the same would be as per agreement between the bidder and the utility.

9. METER BASE & COVER-

The meter Base & cover shall be as per IS 16444/IS 13779. The meter base and cover break to open design. The material for meter base and cover shall be made of high grade polycarbonate.

10. **TERMINAL BLOCK & COVER** - As per IS 16444/IS 13779

11. DESIGN

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-16444 (latest version).

The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling.

12. CIRCUITRY – As per IS 16444

The supplier should submit the details of source/agencies from whom purchase of various components of meters used by them to the utility/purchaser.

13. NAME PLATE AND MARKING

The meter should bear a name plate clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, in the middle of the name plate the words “Name of the Utility”, purchase order no. & year/month of manufacturing shall either be punched or marked indelibly. The rating plate information shall be as per relevant IS.

14. CONNECTION DIAGRAM: As per IS 16444

15. FIXING ARRANGEMENTS:

The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover. The requisite fixing screws shall be supplied with each meter.

16. SEALING ARRANGEMENT:

Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of utility.

17. METER BOX: The Meter Box would be provided as per requirement of the utility.

18. PACKING

- The meters shall be suitably packed for vertical/horizontal support to withstand handling during transportation.
- The meter shall be packed appropriately to ensure safe transportation, handling, identification and storage.
- All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter's performance until its installation.
- The secondary packing shall provide protection during transportation.
- The packing case shall indicate "Fragile in nature" and direction of placement of box.
- Each packing shall indicate marking details like Manufacturer's name, S.No. of meters, quantity etc.

19. TRANSPORTATION

- The meter shall be compact in design. The meter block unit shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation.
- The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.
- The meter should not be exposed to undue shock and mishandling during transportation.
- The stacking of box inside transport media should be such as to avoid their free movement.
- The packing should also be protected from rain and dust by transport media.

- The Bidder shall be responsible for any damage during transit due to inadequate or improper packing.

20. TESTING AND MANUFACTURING FACILITIES AT MANUFACTURER'S PLACE

The manufacturer shall have NABL accredited laboratory to ensure accurate testing calibration as per IS 13779 for acceptance test.

21. INSPECTION

❖ All meters shall be duly tested and sealed by the firm at their premises prior to inspection. Manufacturer seal may be provided on one side of meter. For the other side, the seal with engrave as Utility name may be sent in a pack for provision by utility after completion of test by the utility & after receipt of the meter.

❖ The utility/ purchaser may inspect the meter randomly as per sampling plan for acceptance test as per IS 16444. The meters shall be tested for all functional requirements as part of acceptance test as per IS 16444. After testing, these sample meters shall be additionally sealed and kept in a safe lock for verification, if needed.

****

ANNEXURE – II

CHECK LIST OF DOCUMENT

(The bidder has to submit all the documents as listed in this check list and a copy of the check list duly signed by the authorized signatory)

SL No	Clause No.	Description of Documents	Whether Enclosed or Not
1	7.7a	Profile of the bidder with Name and address of the Bidder and contact details:	YES/ NO
2	5.1	Certificate of Incorporation/ Registration and Memorundum of articles of understanding of the Company in case of single bidder	YES/ NO
3	5.1	Certificate of Incorporation/ Registration and Memorandum of articles of understanding of the Company of the lead bidder and Consortium Agreement clearly highlighting the roles and responsibilities of lead bidder and consortium partner (in case of consortium)	YES/ NO
4	5.2	Whether audited balance sheet of last 3 financial years (2020-21,2019-20 and 2018-19)	YES/ NO
5	5.3	Copy of audited statement of accounts duly certified by CA along with certificate stating the turnover and networth	YES/ NO
6	5.4	Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from client for the work completed/ongoing with contact details as per clause 5.4 along with statement of number of AMI systems commissioned with cumulative customer base with proof.	YES/ NO
7	5.5	Self declaration with details in company letter head signed by authorized signatory and integration certificate from the meter manufacturer as per clause 5.5	YES/ NO
8	5.6	Self declaration with details in company letter head signed by authorized signatory as per clause 5.6	YES/ NO

9	5.7	Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from clients for the work completed/ongoing with contact details as per clause 5.7 along with statement of number of MDMS & data analytics systems commissioned with cumulative customer base with proof.	YES/ NO
10	5.8	Technical Solution document describing overall architecture and operational philosophy of the proposed AMI solution as per clause 5.8	YES/ NO
11	5.9	Self attested Copy of ISO 9001:2015 and CMMI Level III (or above) certifications	YES/ NO
12	5.10	Self declaration each by bidder & Consortium partner in company letter head signed by authorized signatory for not been black listed as per clause 5.10	YES/ NO
13	5.11	a) Undertaking in company letter head signed by authorized signatory for providing bank guarantee of Rs.500000/- after being selected as system integrator and b) Undertaking in company letter head signed by authorized signatory for providing proportionate PBG for the selected system integrator's share of work in the business/project undertaken through joint bidding by ITI and selected system integrator as consortium.	YES/ NO
14	5.12	Self declaration & Detailed description of the resources available along with qualification and experience.	YES/ NO
15	5.13	Declaration confirming the clause-by-clause compliance to statement of this notice for EoI	YES/ NO
16	5.13	Copy of this EoI document duly signed in all pages by the authorized signatory of the bidder.	YES/ NO
17	5.14	Declaration as per the format at Annexure -5 as per clause 5.14	YES/ NO
18	7.7b	Copies of all other statutory registration certificates including PAN, GST, CIN etc., attached	YES/ NO

19	8.7	Self declaration expressing willingness for having exclusive tie-up with ITI Limited is enclosed.	YES/ NO
20	7.7c	Copy of this EoI document duly signed in all pages by the authorized signatory of the bidder . This will be considered as the bidder's clause by clause compliance to the EoI clause	YES/ NO
21	7.7d	Signed Integrity Pact attached Annexure IV	YES/ NO
22	7.7e	Name and details of authorized signatory for signing the Bid document along with Power of Attorney	YES or No
23	8.1	All required documents , certificates and self declarations as mentioned in the evaluation criteria (Annexure VII)	YES/ NO
24	4	Self certification that the AMI solution certification and complains to specifications and requirements as per annexure –I	YES/ NO
25	6.2	EMD of Rs. 5 lakhs and Tender fee of Rs. 10000/- are enclosed as separate cover as per clause 6.2	YES/ NO

Signature of the bidders'
Authorized representative

(Seal)

ANNEXURE –III

Bidder Information

1	Name of the bidder	
2	Address of the bidder	
3	Name of the contact person to whom all referencesshall be made regarding this EoI	
4	Designation of the person to whom all referencesshall be made regarding this EoI	
5	Address of the person to whom all references shallbe made regarding this EoI	
6	Telephone (with STD code)	
7	E-Mail of the contact person	
8	Fax No. (with STD code)	
9	GST No. of the bidder	

Note : Complete bidder information may be provided, add additional information as required.

ANNEXURE – IV

PRE CONTRACT INTEGRITY PACT

(To be executed on plain paper and submitted along with Technical Bid/Tender Documents having a value of Rs.....Or more to be signed by the bidder and same signatory Competent/Authorized to sign the relevant contract on behalf of the ITI Ltd).

Tender / EoI No.....

THIS Integrity Pact is made on ..... day of.....20.....

BETWEEN:

ITI Limited ,.....having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar, Bangalore - 560016 and established under the Ministry of Communications & IT, Government of India (hereinafter called the Principal), which term shall unless excluded by or is repugnant to the context, be deemed to include its Chairman & Managing Director, Directors, Officers or any of them specified by the Chairman & Managing Director in this behalf and shall also include its successors and assigns) ON THE ONE PART

AND:

.....represented by ..... , Chief Executive Officer (hereinafter called the Bidder(s)/Contractor(s)), which term shall unless excluded by or is repugnant to the context be deemed to include its heirs, representatives, successors and assigns of the bidder/contract ON THE SECOND PART.

Preamble

WHEREAS the Principal intends to award, under laid down organizational procedures, tender/contract ..... for (name of the Stores/equipments/items). The Principal, values full compliance with all relevant laws of the land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal has appointed an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles as mentioned herein this agreement.

WHEREAS, to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact the terms and conditions of which shall also be read as integral part and parcel of the Tender Documents and contract between the parties.

NOW THEREFORE, IN CONSIDERATION OF MUTUAL COVENANTS STIPULATED IN THIS PACT THE PARTIES HEREBY AGREE AS FOLLOWS AND THIS PACT W1THNESSETH AS UNDER:

SECTION 1 - COMMITMENTS OF THE PRINCIPAL

The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a) No employee of the Principal, personally or through family members, will in connection with the tender for or the execution of the contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the personal is not legally entitled to.

b) The Principal will, during the tender process treat all bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all bidder(s) the same information and will not provide to any bidder(s) confidential/ additional information through which the bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c) The Principal will exclude from the process all known prejudiced persons.

d) If the Principal obtains information on the conduct of any of its employee, which is a criminal offence under IPC/PC Actor if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary action as per its internal laid down Rules/ Regulations.

SECTION 2 - COMMITMENTS OF THE BIDDERI CONTRACTOR

a) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself observe the following principles during the participation in the tender process and during the execution of the contract.

b) The bidder(s)/contractor(s) will not, directly or through any other per son or firm offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

c) The bidder(s)/contractor(s) will not enter with other bidders/contractors into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

d) The bidder(s)/contractor(s) will not commit any offence under IPC/PC Act, further the bidder(s)/contractor(s) will not use improperly, for purposes of competition of personal gain, or pass onto others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

e) The Bidder(s)/Contractor(s) of foreign original shall disclose the name and address of the agents/representatives in India, if any. Similarly, the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any.

f) The Bidder(s)/Contractor(s) will, when presenting the bid, disclose any and all payments made, are committed to or intend to make to agents, brokers or any other intermediaries in connection with the award of the contract.

g) The Bidder(s)/Contractor(s) will not bring any outside influence and Govt bodies directly or indirectly on the bidding process in furtherance to his bid.

h) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or to be an accessory to such offences.

SECTION 3 - DISQUALIFICATION FROM TENDER PROCESS & EXCLUSION FROM FUTURE CONTRACTS

If the Bidder(s}/Contractor(s), during tender process or before the award of the contract or during execution has committed a transgression in violation of Section 2, above or in any other form such as to put his reliability or credibility in question the Principal IS entitled to disqualify Bidder(s)/ Contractor(s) from the tender process.

If the Bidder(s)/Contractor(s), has committed a transgression through a violation of Section 2 of the above, such as to put his reliability or credibility into question, the Principal shall be entitled exclude including blacklisting for future tender/contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Principal taking into consideration the full facts and circumstances of each case, particularly taking into account the number of transgression, the position of the transgressor within the company hierarchy of the Bidder(s)/Contractor(s) and the amount of the damage. The exclusion will be imposed for a period of minimum one year.

The Bidder(s)/Contractor(s)with its free consent and without any influence agrees and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground including the lack of any hearing before the decision to resort to such exclusion is taken. The undertaking is given freely and after obtaining independent legal advice.

A transgression is considered to have occurred if the Principal after due consideration of the available evidence concludes that on the basis of facts available there are no material doubts.

The decision of the Principal to the effect that breach of the provisions of this Integrity Pact has been committed by the Bidder(s)/ Contractor(s) shall be final and binding on the Bidder(s)/ Contractor(s), however the Bidder(s)/ Contractor(s) can approach IEM(s) appointed for the purpose of this Pact.

On occurrence of any sanctions/ disqualifications etc arising out from violation of integrity pact Bidder(s)/ Contractor(s) shall not entitled for any compensation on this account.

Subject to full satisfaction of the Principal, the exclusion of the Bidder(s)/ Contractor(s) could be revoked by the Principal if the Bidder(s)/ Contractor(s) can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption preventative system in his organization.

SECTION 4 - PREVIOUS TRANSGRESSION

The Bidder(s)/ Contractor(s) declares that no previous transgression occurred in the last 3 years immediately before signing of this Integrity Pact with any other company in any country conforming to the anti-corruption/ transparency International (TI) approach or with any other Public Sector Enterprises/Undertaking in India of any Government Department in India that could justify his exclusion from the tender process.

If the Bidder(s)/ Contractor(s) makes incorrect statement on this subject, he can be disqualified from the tender process or action for his exclusion can be taken as mentioned under Section-3 of the above for transgressions of Section-2 of the above and shall be liable for compensation for damages as per Section- 5 of this Pact.

SECTION 5 - COMPENSATION FOR DAMAGE

If the Principal has disqualified the Bidder(s)/Contractor(s) from the tender process prior to the award according to Section 3 the Principal is entitled to forfeit the Earnest Money Deposit/Bid Security/or demand and recover the damages equitant to Earnest Money Deposit/Bid Security apart from any other legal that may have accrued to the Principal.

In addition to 5.1 above the Principal shall be entitled to take recourse to the relevant provision of the contract related to termination of Contract due to Contractor default. In such case, the Principal shall be entitled to forfeit the Performance Bank Guarantee of the Contractor or demand and recover liquidate and all damages as per the provisions of the contract agreement against termination.

SECTION 6 - EQUAL TREATMENT OF ALL BIDDERS/CONTRACTORS

The Principal will enter into Integrity Pact on all identical terms with all bidders and contractors for identical cases.

The Bidder(s)/Contractor(s) undertakes to get this Pact signed by its sub-contractor(s)/sub-vendor(s)/associate(s), if any, and to submit the same to the Principal along with the tender document/contract before signing the contract. The Bidder(s)/Contractor(s) shall be responsible for any violation(s) of the provisions laid down in the Integrity Pact Agreement by any of its sub- contractors / sub-vendors / associates.

The Principal will disqualify from the tender process all bidders who do not sign this Integrity Pact or violate its provisions.

SECTION 7 – CRIMINAL CHARGES AGAINST VIOLATING BIDDER(S)/ CONTRACTOR(S)

If the Principal receives any information of conduct of a Bidder(s)/Contractor(s) or sub- contractor/sub-vendor/associates of the Bidder(s)/Contractor(s) which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer of the Principal for appropriate action.

SECTION 8 - INDEPENDENT EXTERNAL MONITOR(S)

The Principal appoints competent and credible Independent External Monitor(s) for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extend the parties comply with the obligations under this pact.

Details of IEM appointed by IT1 are as under:

Shri Javeed Ahmad, IPS(Retd.) M-1101, Shalimar Gallant Apartment, Vigyanpuri , Mahanagar, Lucknow- 226006

The Monitor is not subject to any instructions by the representatives of the parties and performs his functions neutrally and independently. He will report to the Chairman and Managing Director of the Principal.

The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all product documentation of the Principal including that provided by the Bidder(s)/Contractor(s). The Bidder(s)/Contractor(s) will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The Monitor is under contractual obligation to treat the information and documents Bidder(s)/Contractor(s) with confidentiality.

The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the project provided such meeting could have an impact on the contractual relations between the Principal and the Bidder(s)/Contractor(s). As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demandfrom the parties that they act in specific manner, refrain from action or tolerate action.

The Monitor will submit a written report to the Chairman & Managing Director of the Principal within…… to …….weeks from the date of reference or intimation to him by the principal and, should the occasion arise, submit proposals for correcting problematic situations.

If the Monitor has reported to the Chairman & Managing Director of the Principal a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman & Managing Director of the Principal has not, within the reasonable time taken visible action to proceed against such offence or reported it to the

Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

The word 'Monitor' would include both singular and plural.

SECTION 9 - FACILITATION OF INVESTIGATION

9.1 In case of any allegation of violation of any provisions of this Pact or payment of commission, the Principal or its agencies shall be entitled to examine all the documents including the Books of Accounts of the Bidder(s)/Contractor(s) and the Bidder(s)/Contractor(s) shall provide necessary information and documents in English and shall extend all help to the Principal for the purpose of verification of the documents.

SECTION 10 - LAW AND JURISDICTION

The Pact is subject to the Law as applicable in Indian Territory. The place of performance and jurisdiction shall the seat of the Principal.

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

SECTION 11- PACT DURATION

This Pact begins when both the parties have legally signed it. It expires after 12 months on completion of the warranty/guarantee period of the project / work awarded, to the fullest satisfaction of the Principal.

If the Bidder(s)/Contractor(s) is unsuccessful, the Pact will automatically become invalid after three months on evidence of failure on the part of the Bidder(s)/ Con tractor(s).

If any claim is lodged/made during the validity of the Pact, the same shall be binding and continue to be valid despite the lapse of the Pact unless it is discharged/ determined by the Chairman and Managing Director of the Principal.

SECTION 12 - OTHER PROVISIONS

This pact is subject to Indian Law, place of performance and jurisdiction is the Registered & Corporate Office of the Principal at Bengaluru.

Changes and supplements as well as termination notices need to be made in writing by both the parties. Side agreements have not been made.

If the Bidder(s)/Contractor(s) or a partnership, the pact must be signed by all consortium members and partners.

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

Any disputes/ difference arising between the parties with regard to term of this Pact, any action taken by the Principal in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.

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

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of the witnesses:

For PRINCIPAL	For BIDDER(S)/ CONTRACTOR(S)
……	……
……	……..
(Name & Designation)	(Name & Designation)
Witness	Witness
1) ……	1) ……
2)……	2) ……

ANNEXURE-V

Declaration regarding "Restrictions on procurement from a Bidder of a country which shares a landborder with India"

(To be submitted on Applicant's Letter Head)

To,

DGM (TS&Mktg)
M/s ITI Limited,
Kanjikode West,
Palakkad -678623
Tel : 0491-2568844
E-mail : bindums_pkd@itiltd.co.in

Dear Sir,

In reference to bid submitted by M/s_____against ITI EoI Document Number :_____, I/We have read the Order No: F.No 6/18/2019-PPDdated: 23-July-2020 from Department of Expenditure, Ministry of Finance regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries.

I/We certify that we/our Collaborator/Assignee are/is not from such a country or, if from such a country, have/has been registered with the Competent Authority and we will not sub-contract any work to a contractor from such countries unlesssuch contractor is registered with the Competent Authority.

We hereby certify that we full fill all requirements in this regard and are eligible to be considered.

We further confirm that evidence of valid registration by the Competent Authority for us/our Collaborator/JV Partner/Consortium member/Assignee, as applicable, is enclosed as Annexure…

***Bidder to strike-off, if not applicable.**

_____

Date :_____ Seal of Organization &

Place :_____ Signature of Authorized Applicant

ANNEXURE-VI

F.No.6/18/2019-PPD
Ministry of Finance
Department of Expenditure
Public Procurement Division

161, North Block,
New Delhi
23rd July, 2020

Office Memorandum

Subject: Insertion of Rule 144 (xi) in the General Financial Rules (GFRs), 2017

Rule 144 of the General Financial Rules 2017 entitled 'Fundamental principles of public buying', has been amended by inserting sub-rule (xi) as under:

Notwithstanding anything contained in these Rules, Department of Expenditure may, by order in writing, impose restrictions, including prior registration and/or screening, on procurement from bidders from a country or countries, or a class of countries, on grounds of defence of India, or matters directly or indirectly related thereto including national security; no procurement shall be made in violation of such restrictions.

(Sanjay Prasad)
Joint Secretary (PPD)
Email ID: js.pfc2.doe@gov.in
Telephone: 011-23093882

To,

(1) Secretaries of All Ministries/ Departments of Government of India
(2) Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi

F.No.6/18/2019-PPD
Ministry of Finance
Department of Expenditure
Public Procurement Division

161, North Block,
New Delhi
23rd July, 2020

Order (Public Procurement No. 1)

Subject: Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs), 2017

Attention is invited to this office OM no. 6/18/2019-PPD dated 23rd July 2020 inserting Rule 144 (xi) in GFRs 2017. In this regard, the following is hereby ordered under Rule 144 (xi) on the grounds stated therein:

Requirement of registration

1. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annex I.**

2. This Order shall not apply to (i) cases where orders have been placed or contract has been concluded or letter/notice of award/ acceptance (LoA) has been issued on or before the date of this order; and (ii) cases falling under **Annex II**.

Transitional cases

3. Tenders where no contract has been concluded or no LoA has been issued so far shall be handled in the following manner: -

    a) *In tenders which are yet to be opened, or where evaluation of technical bid or the first exclusionary qualificatory stage (i.e. the first stage at which the qualifications of tenderers are evaluated and unqualified bidders are excluded) has not been completed*: No contracts shall be placed on bidders from such countries. Tenders received from bidders from such countries shall be dealt with as if they are non-compliant with the tender conditions and the tender shall be processed accordingly.

    b) *If the tendering process has crossed the first exclusionary qualificatory stage*: If the qualified bidders include bidders from such countries, the

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entire process shall be scrapped and initiated *de novo*. The *de novo* process shall adhere to the conditions prescribed in this Order.

c) As far as practicable, and in cases of doubt about whether a bidder falls under paragraph 1, a certificate shall be obtained from the bidder whose bid is proposed to be considered or accepted, in terms of paras 8, 9 and 10 read with para 1 of this Order.

Incorporation in tender conditions

4. In tenders to be issued after the date of this order, the provisions of paragraph 1 and of other relevant provisions of this Order shall be incorporated in the tender conditions.

Applicability

5. Apart from Ministries / Departments, attached and subordinate bodies, notwithstanding anything contained in Rule 1 of the GFRs 2017, this Order shall also be applicable
    a. to all Autonomous Bodies;
    b. to public sector banks and public sector financial institutions; and
    c. subject to any orders of the Department of Public Enterprises, to all Central Public Sector Enterprises; and
    d. to procurement in Public Private Partnership projects receiving financial support from the Government or public sector enterprises/ undertakings.
    e. Union Territories, National Capital Territory of Delhi and all agencies/ undertakings thereof

Definitions

6. "Bidder" for the purpose of this Order (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.

7. "Tender" for the purpose of this Order will include other forms of procurement, except where the context requires otherwise.

8. "Bidder from a country which shares a land border with India" for the purpose of this Order means

a) An entity incorporated, established or registered in such a country; or
b) A subsidiary of an entity incorporated, established or registered in such a country; or
c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
d) An entity whose *beneficial owner* is situated in such a country; or
e) An Indian (or other) agent of such an entity; or
f) A natural person who is a citizen of such a country; or
g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

9. "Beneficial owner" for the purpose of paragraph 8 above will be as under:

(i) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.
Explanation—

a. "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;

b. "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

(ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

(iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

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(v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

10. "Agent" for the purpose of this Order is a person employed to do any act for another, or to represent another in dealings with third persons.

Sub-contracting in works contracts

11. In works contracts, including turnkey contracts, contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in paragraph 8 above. This shall not apply to sub-contracts already awarded on or before the date of this Order.

Certificate regarding compliance

12. A certificate shall be taken from bidders in the tender documents regarding their compliance with this Order. If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate termination and further legal action in accordance with law.

Validity of registration

13. In respect of tenders, registration should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

Government E-Marketplace

14. The Government E-Marketplace shall, as soon as possible, require all vendors/ bidders registered with GeM to give a certificate regarding compliance with this Order, and after the date fixed by it, shall remove non-compliant entities from GeM unless/ until they are registered in accordance with this Order.

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Model Clauses/ Certificates

15. Model Clauses and Model Certificates which may be inserted in tenders / obtained from Bidders are enclosed as **Annex III**. While adhering to the substance of the Order, procuring entities are free to appropriately modify the wording of these clauses based on their past experience, local needs etc. without making any reference to this Department.

(Sanjay Prasad)
Joint Secretary (PPD)
Email ID: js.pfc2.doe@gov.in
Telephone: 011-23093882

To

(1) Secretaries of All Ministries/ Departments of Government of India for information and necessary action. They are also requested to inform these provisions to all procuring entities.

(2) Secretary, Department of Public Enterprises with a request to immediately reiterate these orders in respect of Public Enterprises.

(3) Secretary DPIIT with a request to initiate action as provided under Annex I

(4) Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi

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Annex I: Competent Authority and Procedure for Registration

A. The Competent Authority for the purpose of registration under this Order shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT)*.

B. The Registration Committee shall have the following members*:

   i. An officer, not below the rank of Joint Secretary, designated for this purpose by DPIIT, who shall be the Chairman;
   ii. Officers (ordinarily not below the rank of Joint Secretary) representing the Ministry of Home Affairs, Ministry of External Affairs, and of those Departments whose sectors are covered by applications under consideration;
   iii. Any other officer whose presence is deemed necessary by the Chairman of the Committee.

C. DPIIT shall lay down the method of application, format etc. for such bidders as stated in para 1 of this Order.

D. On receipt of an application seeking registration from a bidder from a country covered by para 1 of this Order, the Competent Authority shall first seek political and security clearances from the Ministry of External Affairs and Ministry of Home Affairs, as per guidelines issued from time to time. Registration shall not be given unless political and security clearance have both been received.

E. The Ministry of External Affairs and Ministry of Home Affairs may issue guidelines for internal use regarding the procedure for scrutiny of such applications by them.

F. The decision of the Competent Authority, to register such bidder may be for all kinds of tenders or for a specified type(s) of goods or services, and may be for a specified or unspecified duration of time, as deemed fit. The decision of the Competent Authority shall be final.

G. Registration shall not be granted unless the representatives of the Ministries of Home Affairs and External Affairs on the Committee concur*.

H. Registration granted by the Competent Authority of the Government of India shall be valid not only for procurement by Central Government and its agencies/ public enterprises etc. but **also for procurement by State Governments and their agencies/ public enterprises etc. No fresh registration at the State level shall be required**.

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I. The Competent Authority is empowered to cancel the registration already granted if it determines that there is sufficient cause. Such cancellation by itself, however, will not affect the execution of contracts already awarded. Pending cancellation, it may also suspend the registration of a bidder, and the bidder shall not be eligible to bid in any further tenders during the period of suspension.

J. For national security reasons, the Competent Authority shall not be required to give reasons for rejection / cancellation of registration of a bidder.

K. In transitional cases falling under para 3 of this Order, where it is felt that it will not be practicable to exclude bidders from a country which shares a land border with India, a reference seeking permission to consider such bidders shall be made by the procuring entity to the Competent Authority, giving full information and detailed reasons. The Competent Authority shall decide whether such bidders may be considered, and if so shall follow the procedure laid down in the above paras.

L. Periodic reports on the acceptance/ refusal of registration during the preceding period may be required to be sent to the Cabinet Secretariat. Details will be issued separately in due course by DPIIT.

[*Note:

i. In respect of application of this Order to procurement by/ under State Governments, all functions assigned to DPIIT shall be carried out by the State Government concerned through a specific department or authority designated by it. The composition of the Registration Committee shall be as decided by the State Government and paragraph G above shall not apply. However, the requirement of **political and security clearance as per para D shall remain and no registration shall be granted without such clearance**.

ii. Registration granted by State Governments shall be valid only for procurement by the State Government and its agencies/ public enterprises etc. and shall not be valid for procurement in other states or by the Government of India and their agencies/ public enterprises etc.]

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Annex II: Special Cases

A. Till 31st December 2020, procurement of medical supplies directly related to containment of the Covid-19 pandemic shall be exempt from the provisions of this Order.

B. *Bona fide* procurements made through GeM without knowing the country of the bidder till the date fixed by GeM for this purpose, shall not be invalidated by this Order.

C. *Bona fide* small procurements, made without knowing the country of the bidder, shall not be invalidated by this Order.

D. In projects which receive international funding with the approval of the Department of Economic Affairs (DEA), Ministry of Finance, the procurement guidelines applicable to the project shall normally be followed, notwithstanding anything contained in this Order and without reference to the Competent Authority. Exceptions to this shall be decided in consultation with DEA.

E. This Order shall not apply to procurement by Indian missions and by offices of government agencies/ undertakings located outside India.

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Annex III

Model Clause /Certificate to be inserted in tenders etc.

(While adhering to the substance of the Order, procuring entities and GeM are free to appropriately modify the wording of the clause/ certificate based on their past experience, local needs etc.)

Model Clauses for Tenders

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Order means: -

a. An entity incorporated, established or registered in such a country; or
b. A subsidiary of an entity incorporated, established or registered in such a country; or
c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
d. An entity whose *beneficial owner* is situated in such a country; or
e. An Indian (or other) agent of such an entity; or
f. A natural person who is a citizen of such a country; or
g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The *beneficial owner* for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.
Explanation—

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

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b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. *[To be inserted in tenders for Works contracts, including Turnkey contracts]* The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

Model Certificate for Tenders (for transitional cases as stated in para 3 of this Order)

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I hereby certify that this bidder is not from such a country and is eligible to be considered."

Model Certificate for Tenders

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the

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Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for Tenders for Works involving possibility of sub-contracting

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for GeM:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this vendor/ bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this vendor/ bidder fulfills all requirements in this regard and is eligible to be considered for procurement on GeM. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

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ANNEXURE-VII

CRITERIA FOR TECHNICAL EVALUATION

SL NO	PARAMETERS	VALUE	DOCUMENTS REQUIRED	Marks
1	**FINANCIAL PARAMETERS(FY 2020-21, FY 2019-20, FY 2018-19)**	**The cumulative turnover of the bidder for last 3 years achieved by the bidder as per their audited financial results**		
		125 to 150Crores	Copy of the Audited Balance Sheet of the last 3 financial years	3
		150 to 175 Crores		5
		Above 175Crores		7
		Average Profit After Tax of the bidder for the last 3financial years		
		UP TO 7.5Crores	Profit and loss statement of the last 3 financial years	2
		7.5 TO 15Crores		3
		Above 15Crores		5
2	**No of AMI solutions & System integration projects for any DISCOM/PSU in India implemented during Last 5 years**	3nos	Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from client for the work completed/ongoing with contact details of the customers	2
		4 to 5nos		3
		above 5nos		5
3	**No ofSmart energy meters integrated in the AMI projects for any DISCOM/PSU in India completed/ongoing in last 5 years (cumulative)**	3 Lakhs	-do-	2
		Above 3 Lakhs upto 3.5 lakhs		3
		Above 3.5 Lakhs upto 5 lakhs		5
		above 5 Lakhs		8
4	**No of clients to which MDMS and data analytics implemented in the Indian power utility sector during Last 5years**	3nos	-do-	2
		4 to 5nos		3
		above 5nos		5
5	**Exclusive Tie up.**	**Bidder is willing for exclusive tie up with ITI Limited, for system integration of AMI**		
		If Yes	Self declaration duly signed by authorized signatory	5
		If No		0
6	**No of professional manpower available in the AMI division in India/abroad**	50 nos	Self declaration & Detailed description of manpower resources available with the bidder	2
		51 to 99		3
		100 to 150		4
		151 and above		5

7	**Comprehensive Technical presentation**	Comprehensive presentation of the proposed AMI solution as per thebid document submittedby the bidder before the evaluation committee.	30
Total			70