



ITI LIMITED
PALAKKAD PLANT

KANJIKODE WEST, PALAKKAD – 678 623, KERALA STATE, INDIA

REQUEST FOR PROPOSAL TO EMPANEL PARTNERS FOR TECHNOLOGY TRANSFER AND MANUFACTURING OF DOMESTIC/COMMERCIAL GAS METERS (WITH/WITHOUT AMR) AND INTEGRATION WITH SMART METERING SYSTEM

Ref: ITI/SGM/RFP/01

Date: 15/03/2021

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 Palakkad plant has plans to enter into the manufacturing of **Domestic/Commercial gas Meter (with/without AMR)** for Gail Gas Limited(GGL) & other players

ITI invites responses to this Request for proposal (RFP) from reliable technology providers willing for the technology transfer and support ITI for the manufacturing of **Domestic/Commercial gas Meter (with/without AMR)** and **integration with Smart Metering System** .

The tender will be processed as an open tender basis.

Schedule	Date
RFP Issue Date	15/03/2021
Due date for queries for clarification	19/03/2021
Release of response to queries	22/03/2021
Due date for submission of RFP	30/03/2021 2.00 P M
Technical Bid Opening at ITI Palakkad	30/03/2021 2.30 P M

Earnest Money Deposit and Tender Fee: - Bidder shall Provide an EMD of Rs. 100000(Refundable) and a tender fee of Rs. 5000(Non Refundable) as separate DDs.

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

Submission of response to this RFP 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 & Mktg)

ITI Limited,

Kanjikode West, Palakkad - 678623

Ph: 0491-2568844

Mobile: 09497128550

Email: bindums_pkd@itiltld.co.in

Web Site: <https://www.itipalakkad.in/>, Corporate Web site: <https://www.itiltld.in/>

REQUEST FOR PROPOSAL TO EMPANEL PARTNERS FOR TECHNOLOGY TRANSFER AND MANUFACTURING OF DOMESTIC/COMMERCIAL GAS METERS (WITH/WITHOUT AMR) AND INTEGRATION WITH SMART METERING SYSTEM

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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. The unit is also having PCB Manufacturing facility which can support the manufacturing of PCBs upto 10 layers. Palakkad plant has ventured into the manufacturing of Smart Energy Meters as per the latest IS standard IS 16444 .

2) Purpose of RFP

- 2.1) As part of our business expansion, ITI is planning to enter into the business segment of manufacturing and supply of Domestic/Commercial gas Meters (with /without AMR) and integration with the Smart Metering System as required for Gail Gas Limited (GGL) and other customers.
- 2.2) ITI intends to empanel reputed and reliable Technology providers for the transfer of technology and support ITI Ltd for the setting up of manufacturing facilities ,manufacturing of Domestic/Commercial gas Meters (with/without AMR) and integration with the Smart Metering System. The selected partners shall provide technology and knowhow for the manufacturing of Domestic/Commercial gas Meters as per relevant standards as applicable for Gas meters such as EN 1359: 1999 and other latest amendments.
- 2.3) ITI is also willing to have manufacturing & marketing rights of Domestic/Commercial gas Meters and Smart Metering System with the technology of selected partner , on mutually agreeable terms and conditions. ITI intends to front end the marketing of the product for Indian customers.

3) Proposed Business Model

- 3.1) ITI seeks the partnership from reputed Technology Providers for Technology transfer and supporting ITI for the Manufacturing of Commercial/ Domestic Gas Meter (with/without AMR) in Indian Market as per the EN-1359 standard.
- 3.2) In the initial phase, ITI may procure fully finished product from the partner for immediate supplies and product evaluation.
- 3.3) In the next phase, ITI will acquire technology from the partner and commence assembly and testing at ITI with SKD/CKD kits procured from the recommended sources by the partner. The required infrastructure for manufacturing the product will be set up at ITI based on the recommendations and assistance of the partner.

- 3.4) ITI will opt further for the complete manufacturing of product at ITI with SKD/CKD kits depending on market conditions.
- 3.5) The Technology Partner shall be ready to support ITI for all Purchase orders of customers for bidding / supply/warranty support of Commercial/Domestic Gas Meter as per customer requirements.
- 3.6) The partner has to associate with ITI in integrating the AMR Domestic/Commercial gas Meters with Smart Metering System and the database of the customer and also providing operating and maintenance services.
- 3.7) With this background, ITI invites business proposal from Technology providers of Commercial/Domestic Gas Meter (G1.6) Manufacturer who are fulfilling the following conditions to address business opportunity for the said product.

4) Scope of Work

- 4.1) The partner has to provide technology transfer and Knowhow of Commercial/Domestic Gas Meter (with/without AMR) which includes the hardware/software design, manufacturing, assembly, inspection, testing, quality assurance methods ,troubleshooting, supply, Installation, Commissioning , servicing/ maintenance during the warranty/post warranty period, , training, documentation, design upgrades etc with respect to the product as per various tendered customer requirements .
- 4.2) The partner shall be willing to provide support to ITI in all activities including supply as finished product (i.e as SKD) or CKD basis and system integration to ITI, related to various Purchase Orders placed by the end customer to ITI , on mutually agreed commercial terms & conditions of Customer's Work order/PO
- 4.3) The partner has to support ITI in setting up the infrastructure for the manufacturing, assembly and testing of the product
- 4.4) The partner will be fully responsible for the customization of the Domestic/Commercial gas Meters (with/without AMR) and its integration with the Smart Metering System as per the specifications and requirements of end customer on behalf of ITI.
- 4.5) The partner has to provide free samples and liaise with the concerned certification bodies for obtaining the required product certifications and also support ITI in getting the statutory licenses. ITI shall bear the certification/license fees as per the requirement.
- 4.6) The partner on his cost shall support ITI for field trial/proof of concept(PoC) as part of pre-supply qualification for the customer orders
- 4.7) The partner has to provide free software upgrades/firmware/patches for the product as per customer order conditions
- 4.8) The partner has to support ITI in developing the test jigs,fixtures etc as required for the testing of the product
- 4.9) The partner shall implement all necessary modifications in Hardware and carry out periodic version upgrades and updates to the hardware and software during the pre sales and post sales phases of the product to ascertain the compliance of the product with the SOR and specifications.
- 4.10) The partner shall provide free of cost training to ITI Engineers for Manufacturing, assembly, testing, quality control, Installation ,Maintenance, AMR system and all associated software .

- 4.11) The partner has to support ITI in the bidding of the tenders of various customers for the technical and commercial aspects . Both ITI and the selected partner will mutually discuss and work out the best competitive rate for offering to the customer against the tender . In the case of Consortium bidding, ITI will be the lead bidder. Also in the case of counter offers given by customer, both ITI and partner will make all efforts to match the prices for providing supply and services as per the terms and conditions of the purchase order.
- 4.12) The selected partner has to sign a memorandum of Understanding for the Transfer of Technology agreement with ITI Limited including this empanelment RFP conditions and subsequent commercials . Any additional terms and conditions of the MoU shall be mutually discussed and finalized during technology transfer .
- 4.13) ITI can also be a manufacturing partner for the selected technology partner

5) Schedule of requirements (SOR) and Product specification

- 5.1) As detailed above, the Domestic/Commercial gas Meters (with/without AMR) is meant for supplying to GGL/other customers and the meters will be installed , integrated with the Smart Metering system and maintained by ITI with the support of the selected partner as per the requirements of GGL/other customers.
- 5.2) The selected partner to ensure that the product shall meet the technical specification document received from GGL/other customers and ensure compliance for all the points in the scope of requirements (Generic specification of GGL attached to this RFP as **Annexure I**, which is tentative and subject to change as per customer requirements).
- 5.3) The selected partner shall be responsible to provide the technology so that the compliance of latest SOR and specifications issued by GGL/other customers during the time of tendering/ordering is assured.

6) Prequalification requirements (PQR):

- 6.1) The Bidder should be an Indian Company registered under Indian Company's Act 1956 or 2013 . Certification of registration for bidder to be submitted. The bidder has to be in the business of Gas meters during last 3 years
- 6.2) The Bidder shall have a sound financial background with cumulative turnover of minimum Rs. 100 Cr for the last 3 years. Audited Balance sheet for 3 years to be enclosed.
- 6.3) The bidder should be financially strong with a positive net worth during last 3 years.
- 6.4) The bidder should be profit making organization during last 3 years .
- 6.5) The bidder shall be:
- a) a manufacturer of Domestic/Commercial gas Meter having own manufacturing facility . Proof for design capability with details of design , manufacturing and R&D facilities, details of resources available , types of gas meters supplied in India during last 3 years etc shall be submitted along with the bid. The bidders shall attach their product list with all domestic/commercial gas meters of varying specifications. Bidders having own manufacturing facility in India will be given preference during evaluation.

or

- b) an authorized representative of the Original Equipment Manufacturer (OEM) for Domestic/Commercial gas Meter . The authorization from the OEM to be submitted as part of the bid . The details of OEM such as Country of origin, design, manufacturing and R&D facilities, details of resources available, types of gas meters supplied in India during last 3 years etc shall be submitted along with the bid. The bidders shall attach OEM's product list with all domestic/commercial gas meters of varying specifications as part of bid.
- 6.6) The quantum of products supplied by the bidder in the Indian market only will be considered for the evaluation of the proposal. During the evaluation process, the bidder needs to make a presentation/ demo of the product and the product support facilities to ITI .
- 6.7) The bidder should have experience in supply of Gas meter for at least 3 years as on the date of RFP. Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from client for the work completed with contact details shall be submitted with the proposal.
- 6.8) The bidder should have supplied a minimum of 5 Lakh Numbers of gas meters during last 3 years.
- 6.9) Bidder who is willing to have exclusive agreement with ITI for Technology transfer and marketing shall be given preference during evaluation
- 6.10) The bidder/OEM should have annual manufacturing capacity of minimum 2 Lakh numbers of gas meter. Self declaration & detailed description of the facilities and resources available with the bidder shall be submitted with the proposal
- 6.11) The bidder shall have product certification as per BS EN 1359:1999 and latest amendments for Gas meter
- 6.12) The bidder shall have:
- a) their own complete AMR solution and expertise in the integration of the AMR system with the MDM/ASP software of the GGL as per the GGL SoR.
- or
- b) a have a valid agreement with a reputed AMR solution provider for implementing the AMR solution
- 6.13) Bidder shall be ready for complete Transfer of Technology to ITI for the hardware/software design, manufacturing, assembly, testing, quality check, installation, maintenance and repair services, training of ITI personnel, documentation, technical support, design/software upgrades etc. Self declaration by the bidder agreeing for Transfer of Technology and manufacturing support to be submitted along with bid.
- 6.14) The bidder shall be willing to provide manufacturing & marketing rights to ITI on mutually agreeable terms and conditions. The bidder should provide a self declaration in this regard.
- 6.15) The bidder shall submit a declaration confirming the clause-by-clause compliance statement to ITI's RFP including the GGL Specifications & SoR (Annexure II) as part of the bid

Or

A copy of this RFP duly signed on each page by the authorized representative of the bidder shall be enclosed as part of the proposal which will be considered as compliance to all clauses of this RFP. .

- 6.16) The bidder should not have been black-listed at any time by any customer. A self declaration in this regard has to be enclosed.
- 6.17) Self Declaration stating that the bidder/OEM is not from a country which shared land border with India

7) Documents to be submitted with RFP:

- a) Company Profile including name, address, and contact details.
- b) Certificate of Incorporation / Registration details of the Company,
- c) Copies all other statutory registration certificates including PAN, GST etc.,
- d) Financial performance of the bidder. Copies of audited annual report for last 3 years showing details of turnover, profit/loss, and networth etc. shall be enclosed.
- e) If bidder is an authorized agent, authorization letter from OEM to undertake this business with ITI
- f) Self declaration & Detailed description of the facilities and resources available with the bidder/OEM along with the details of annual manufacturing capacity.
- g) If the bidder who is not having any agreement (similar to as detailed in this RFP) for providing technology to any other firm, self declaration duly signed by authorized signatory expressing willingness for having exclusive tie-up with ITI Limited as per this RFP
- h) Product Brochure/ Technical literature for the proposed **Domestic/Commercial gas Meters (with/without AMR) and Smart Metering System**

and

Project proposal describing the product & AMR solution , integration with Smart Metering System, process flow, capital equipments required for assembly & testing, ToT implementation plan with time schedule etc.
- i) Self declaration agreeing for Transfer of Technology and manufacturing support to be submitted along with bid.
- j) Self declaration for providing exclusive manufacturing & marketing rights to ITI .
- k) Signed copy of RFP document with signature on each pages for Clause by Clause Compliance of RFP.
- l) Self declaration for not being blacklisted by any parties.
- m) Copies of purchase orders received for the Domestic/commercial gas meters (with/without AMR) system and Client certificates mentioning the satisfactory performance of the supplied equipment within India for the last 3 years.
- n) Signed Integrity Pact (copy of which is enclosed at Annexure IV).
- o) The power of authorization 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).
- p) All required documents , certificates and self declarations as mentioned in the evaluation criteria

(Annexure II)

- q) Copies of all certificates of the product complying with the GGL SoR & Spec. at Annexure I
- r) Self Declaration stating that the bidder/OEM is not from a country which shared land border with India
- s) The check list of documents provided as per Annexure III

8) RFP Submission:

8.1) Interested Technology providers of **Domestic/Commercial gas Meters**, having the qualifications as per clause 6 of this RFP, shall submit sealed proposals as per this RFP with the supporting documents mentioned in clause 7 and Annexure III and IV of this RFP document.

8.2) EMD/Tender fee : - Bidders shall submit two demand drafts, one for an amount of Rs. 1,00,000/- (Rupees one lakh only) towards Earnest Money Deposit (refundable) and another for an amount of Rs. 5,000/- (Rupees five 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.

Bids not accompanied by the requisite amount of EMD and tender fee shall be considered irresponsive and will be rejected. The Bid Security/EMD of unsuccessful Bidder(s) as per this EoI will be returned without interest before proceeding with the commercial bid process. The Bid Security/EMD of the Successful empanelled Bidders will be retained by ITI Limited till the finalization of commercial bid. The EMD of the selected bidder, after the commercial bid process, will be returned after the submission of a Performance Bank Guarantee of an amount equal to the value of EMD to ITI by the selected bidder.

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 successful bidder in the commercial bid process, if the Bidder:

1. fails to sign the MoU and ToT agreement as per the business model detailed in this RFP or
2. fails to accept the award of contract as per the commercial bid process in continuation with the empanelment of partners or
3. fails to furnish Performance Bank Guarantee for an amount equal to EMD within specified time in accordance with the RFP.

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.

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

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

8.4) The last date for receiving the proposal is 30/03/2021 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 4 and sub clauses, Annexure II and III of this request for RFP will be rejected.

8.5) The bid can be submitted as hard/ soft copy. In case of soft copy, the same can be sent through E-mail to reach before the deadline and one set of hard copy to be received within 6 days from the RFP 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. Proposals receiving alter the due date will be summarily rejected.

8.6) The corrigendum (if any) shall be available only online at www.itilttd-india.com and <https://eprocure.gov.in/cppp/>

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

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

8.8) All enquiries / clarifications from the Applicants, related to this EOI, must be directed in writing All enquiries / clarifications from the Applicants, related to this EOI, must be directed in writing

8.9) 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

- 8.10) 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.itilt-d-india.com.
- 8.11) 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 applicant, modify the RFP document by a corrigendum.
- 8.12) Any such corrigendum shall be deemed to be incorporated into this RFP.
- 8.13) In order to provide prospective applicants reasonable time for taking the corrigendum into account, ITI may, at its discretion, extend the last date for the receipt of rfp proposals which shall again be notified online through ITI portal www.itilt-d-india.com and <https://eprocure.gov.in/cppp/>
- 8.14) All the pages of the bid shall be signed by an authorized person

9) Other terms and conditions:

- 9.1) 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.
- 9.3) 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.
- 9.4) Cost of RFP: The bidder shall bear all costs associated with the preparation and submission of its RFP, 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 RFP process.
- 9.5) The Bidder shall be ready to give clarifications on any part of the offer to ITI.
- 9.6) Amendment of RFP: 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 RFP 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 RFP.
- 9.7) 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.

10) Scrutiny, evaluation of RFP, and Empanelment

- 10.1) Each Agency shall submit their proposals which includes the supporting documents as mentioned in Annexure III (Evaluation Criteria) of this RFP and based on the prequalification requirements as mentioned in clause 3 and supporting documents as per clause 4.0 of RFP. The proposal of the bidders who is not having the prequalification criteria as per the clause 4.0 will not be considered for further evaluation.
- 10.2) ITI will constitute an Evaluation Committee to evaluate the responses of the applicants. The Evaluation Committee shall evaluate the responses to the EOI and all supporting documents & documentary evidence. The committee may seek additional documents & presentation as it deems necessary.
- 10.3) The bidders will be evaluated based on the Evaluation criteria mentioned in Annexure III (Evaluation Criteria) of this RFP and based on the prequalification requirements as mentioned in clause 3 and supporting documents as per clause 4.0 of RFP. The bidders shall make sure to provide complete information required as per the criteria for technical evaluation at Annexure –III
- 10.4) The prospective bidders need to get minimum marks in each of the nine parameters and score a minimum total of 25 marks out of 50 marks as per the evaluation criteria will be selected and empanelled.
- 10.5) The empanelled bidders as per the RFP will be invited for participating in a limited commercial bid for selection of partner for transfer of technology and setting up manufacturing facility at ITI Limited as explained in clause 2.5 (Proposed business model) in this RFP.
- 10.6) The decision of the Evaluation Committee in the evaluation of responses to the Expression of Interest shall be final. No correspondence will be entertained outside the evaluation process of the Committee.
- 10.7) Right to accept or reject any or all RFPs:
 - a) Notwithstanding anything contained in this RFP, ITI reserves the right to accept or reject any bid and to annul the RFP 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 RFPs.
 - b) ITI reserves the right to disqualify any bidder during or after completion of RFP 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 response to the RFP. 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.
- 10.8) ITI reserve the right to reject proposal of any bidder who is not having manufacturing facility in India and submitting the proposal as per their supply agreement with any foreign company, on reasons imposed by orders/restriction of Government of India such as denial of procurement from country which shared land border with India.

ANNEXURE - I

000025

TECHNICAL SPECIFICATION FOR NATURAL GAS
METERS (DOMESTIC)

Rev. 0

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TECHNICAL SPECIFICATION

**NATURAL GAS METERS
(DOMESTIC)**

TECHNICAL SPECIFICATION FOR NATURAL GAS
METERS (DOMESTIC)

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1.0 INTRODUCTION

The intent of this specification is to establish minimum requirements for manufacturing and supply of Domestic Gas Meters required for PNG measurement to domestic customers for City Gas Distribution project in India.

2.0 SCOPE

The scope of work shall cover (but not limited to) supply, design engineering, documentation, manufacturing, testing, inspection, preparation for shipment and transportation of the domestic gas meters. This also including packaging, insurance, handling, transportation, loading / unloading at sites/ designated store, documentation etc. and providing all related services conforming to respective data sheets, this technical specification along enclosed with tender with national / international standards specified. The tender may be under complete supply or on Annual Rate Contract (ARC) basis, refer bid documents.

The bidder's scope shall also include hiring of Third Party Inspection Agency (TPIA) from the list of TPIAs approved by the company for inspection as per approved QAP; refer relevant sections of the bid documents for list of approved TPIAs and QAP.

The supplier shall comply with local statutory regulations of Legal metrology of 2009 and Legal Metrology (Enforcement) rules, 2011. Such natural gas meters shall have compliance and tested in accordance with requirements of PNGRB, Technical Standards & specifications including Safety standards for City or Local Natural Gas Distribution Networks (also known as T4S), BS EN 1359:1999+A1:2006 or 2017 or the latest edition in force / OIML R 137-1 & 2 for Gas Meters standards and as per the requirements of this specification.

3.0 GENERAL

3.1 Definitions

Subject to the requirements of the context, the terms (hereafter listed in alphabetical Order) used in this specification are given the following meaning:

AGREEMENT	Designates the agreement concluded between the CLIENT and the CONTRACTOR, under which the latter undertakes to the former the GOODS and/or SERVICES according to the stipulations which are agreed and specified in the form of an order.
CLIENT / OWNER	Designates the purchaser of the GOODS and/or SERVICES, which are the subject of the AGREEMENT.
CONTRACTOR/SUPPLIER	Designates the individual or legal entity with whom the order has been concluded by the CLIENT. The term "CONTRACTOR/SUPPLIER" may be used indifferently for a supplier, a manufacturer, an erection CONTRACTOR / SUPPLIER, etc.
DAYS - WEEKS - MONTHS	Specify the number of calendar days, weeks or months and not of working days, weeks or months.

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CLIENT'S REPRESENTATIVE

Designates the individual or legal entity to which the CLIENT has entrusted various tasks in relation with the carrying out of his PROJECT

GOODS and/or SERVICES

Designate, depending on the case, all or part of the drawings or documents, substances, materials, materiel, equipment, structures, plant, tools, machinery, to be studied, designed, manufactured, supplied by the CONTRACTOR/SUPPLIER under the AGREEMENT, including all the studies, tasks, works and services specified by the order. The Terms GOODS or SERVICES may be indifferently used one for the other as required by the context.

PROJECT

Designates the aggregate of GOODS and/or SERVICES to be provided by one or more CONTRACTOR/SUPPLIERS.

CUSTOMER

Party or Individual that engages owner for PNG supply service

3.2 Review & Approval:

Whenever Client and/or Client's Representative's review and approval is requested on a document to be submitted by the Contractor / Supplier or before an action is implemented by the Contractor / Supplier, such review and/or approval shall always be requested in writing by the Contractor / Supplier to the Client and/or the Client's Representative's before any action subject of this review and/or approval is taken. Client and/or Client's Representative's approval shall always be given in writing.

3.3 REFERENCES:

Unless otherwise specified, the latest editions of the standards mentioned herein this specification including all addenda and revisions shall apply. All pressure values mentioned in this specification are in gauge.

4.0 ABBREVIATIONS

PNGRB	:	Petroleum and Natural Gas Regulatory Board
BS	:	British Standard
EN	:	European Standard
DVGW	:	Deutscher Verein des Gas- und Wasserfaches e.V.
RF	:	Radio Frequency
RFID	:	Radio Frequency Identification
TPIA	:	Third Party Inspection Agency
WPC	:	Wireless Planning & Coordination Wing
AMR	:	Automatic Meter Reading
ATEX	:	ATMosphere EXplosibles (French: Explosive Atmospheres)
MIU	:	Meter Interface Unit
OEM	:	Original Equipment Manufacturer
MOP	:	Maximum Operating Pressure
QAP	:	Quality Assurance Plan
TPIA	:	Third Party Inspection Agency
PO	:	Purchase Order

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- XI. All the Meters shall be tested for external leak tightness and resistance at 1.5 times the design pressure.
- XII. Refer Data sheet of Domestic Gas Meter enclosed separately.

Automatic Meter Reading System:

The meter shall be equipped with a mechanism to enable retrofitting of a Meter Interface Unit for Remote / Automated Meter Reading System. For this purpose, the pulse generating mechanism shall be in-built into the meter and shall be based on proximity sensor magnetic or inductive principle and should remain unaffected by an external magnet (of any capacity) to the best extent possible during the remote meter reading. During the inspection of the gas meters at the works of the manufacturer by client/PMC, the vendor shall carry out tests to demonstrate that the gas meters are capable of generating pulses, compatible with an AMR system and AMR reading is not affected by external magnet of any capacity. Any Diaphragm meters with magnetic pulse principle with a magnetic tamper alarm are acceptable subjected to any tempering event by any capacity magnet; alarm has to be generated and recorded in the system and AMR. For demonstration; necessary arrangement has to be made by the vendor during inspection. (Refer clause no 7.15).

Domestic Gas Meters must be suitable for retrofitting of AMR in future and communication with any technology such as RF (walk-by/fixed) / GPRS / LORA/LPRF or similar meeting the requirement.

7.0 INSPECTION, TESTING AND QUALITY ASSURANCE

The Vendor shall provide details of their quality assurance procedures during the assembly of the units and for final inspection as per Inspection Plan. (Client) /MECON reserves the right to visit the Supplier's facilities without prior notice, and inspect test records and witness assembly and testing in progress.

- 7.1 Inspection shall be carried out as per the approved Technical Specification, Inspection Plan/QAP meeting EN 1359 / OIML requirements.
- 7.2 Vendor shall submit QAP to Client / PMC for approval as per given format with minimum requirements as specified.
- 7.3 For any control, test or examination required under the supervision of PMC / TPIA / Owner/ Owner's representative, later shall be informed in writing one (1) week in advance by vendor about inspection date and place along with production schedule.
- 7.4 The Vendor shall provide calibration certificate and accuracy at MAOP of the Domestic Gas Meter for the following flow rates (As per EN 1359 latest / OIML):
- | | | |
|-----------|--------------|-----------|
| Q_{MIN} | $0.1Q_{MAX}$ | Q_{MAX} |
|-----------|--------------|-----------|
- 7.5 Vendor shall hire Third Party Inspection Agency (to be approved by the Client) to perform inspection work all inclusive in quoted price. This agency shall inspect all the equipment/material and issue all inspection certificates/reports as per specifications and codes. Client / PMC may also do Inspection by along with TPI appointed by bidder.

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- 7.6 Inspection as per approved QAP shall be performed / witnessed / carried out on each lot by a Third Party Internationally recognized Inspection agencies like Lloyds, ABS, SGS, TUV, DNV, BV, Engineers India limited or any other third party inspection agency only with prior approval of client / MECON, for witnessing inspection and testing as required. Indian agent / Indian representative supplying the materials from their foreign manufacturer's works shall also include third party inspection at foreign manufacturer's works as defined above
- 7.7 Vendor shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports, Accuracy test report for individual meter, as per Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.
- 7.8 Review of calibration certificates for all the measuring instruments at the line of inspection, i.e., used for checking and testing, along with the Master calibration certificate of the measuring instruments from which the instruments is calibrated.
- 7.9 Third party inspection agency appointed by bidder shall carry out inspection during final inspection at the works of the manufacturer and submit all original test / inspection reports with released note for review of client/ PMC.

In case of Indian agent / representative supplying materials from their foreign manufacturer's works; third party inspection shall be carried out at manufacturer's works only and submit all original test/ inspection reports with released note for review of client/ PMC.

- 7.10 PMC or client /their representative may also join along with TPI (appointed by bidder) during the inspection. At least 15 days advance intimation shall be given for such inspection call along with the name of approved Third Party Inspection agency as suggested below.
- 7.11 All meters should be sealed properly by the manufacturer after final inspection clearance and before dispatch. Meters found in an unsealed condition will not be accepted.
- 7.12 If the performance of any of the sample meter/AMR is not in compliance with the acceptance norms of the respective standards then that the lot of respective item will be rejected.
- 7.13 Vendor should furnish QAP in line with EN 1359:1999+A1 2006 or latest standard for domestic diaphragm gas meter as per format attached with the tender (Sample only). For Other type of Domestic Gas meter QAP shall be furnished for approval meeting OIML requirement.
- 7.14 Even after third party inspection, client/Inspector reserves the right to select a sample of Domestic Meters randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in Technical specification, then client/Inspector reserves the rights to reject all production supplied from the batch.
- 7.15 2% or maximum 05 no's randomly selected meters by Client/PMC shall be sent to FCRI for verification and testing as per approved QAP during the contract period (will be in under Client's scope). If any meter failed to meet desired result will be rejected, and additional double sample will be tested at FCRI in presence of Client /PMC. If the second time meter again fails to meet the desired result, then complete lot will be rejected and all payment made against that lot (if any) shall be recovered along with all expenditure for testing at FCRI.

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DO	:	Delivery Order
DD	:	Contractual Delivery Date
FTP	:	File Transfer Protocol.
OIML	:	International Organization of Legal Metrology (OIML)

5.0 CODES, STANDARD AND LEGAL REQUIREMENTS

All meters shall comply with the requirements of PNGRB guidelines. In case of dispute between PNGRB and other codes, PNGRB guidelines shall prevail. Below mentioned standards shall be complied by the Bidder.

The vendor shall furnish (along with the technical bid) a copy of the approval documents, certificates (in English language only) for each of the offered model, for compliance to the requirements of following standards:

- BS EN : 1359:1999+A1 Amendment 2006 or EN 1359-2017 or latest edition in force.
(The certificate as per 1359:1999+A1 Amendment 2006 valid as on bid due date than only it will be accepted; otherwise certificate in compliance to EN 1359-2017 has to be provided)
- ATEX : 94/9/EC Directive.
- IEC 60529 : Degrees of Protection Provided by Enclosure
- ANSIB1.20.1 : Pipe Threads
- ISO 27001 : Information security standards.
- PNGRB : T4S standard
- W&M : Weights and Measure India
- OIML R 137 1 & 2 : International Organization of Legal Metrology standard for Gas Meters

Mandatory Requirements for Domestic Gas Meters: (To be submitted along with bid)

- a) Meters shall have compliance to the test requirements of EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition in force for Domestic Diagram Gas Meter / OIML R 137-1 & 2 for other type of Gas Meters as per PNGRB regulatory requirement (refer T4S).
- b) Product Certification Type Approval/ Type Compliance/ Type Examination as per EN 1359-1999+A1:2006 OR EN 1359-2017 or the latest edition in force for Domestic Diagram Gas Meter / OIML R 137-1 & 2 for other type of Gas Meters as per PNGRB regulatory requirement (refer T4S) issued by a notified body /agency accredited by UKAS or any Member of European co-operation for Accreditation (EA). The certificate shall be submitted along with Bid.
- c) For Indian manufacturer Valid Model approval, Valid License for manufacturing, Valid License for Sales & Services certificates from Legal Metrology Department - Weights and Measures, India for domestic meter (G 1.6) shall be submitted along with bid. All the weights and measures approval should also be valid for the period during which the meters are to be supplied. For Foreign Manufacturer Model approval & importing license for domestic meters import to India from W&M India issued to the Foreign Manufacturer or representative as mentioned in the certificate shall be submitted along with bid.
- d) Bidder shall submit an undertaking that the diaphragm meter supplied by them shall perform within the accuracy limits prescribes by EN 1359-1999+A1:2006 /

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EN 1359-2017 / latest edition in force, for a period of 10 years from the date of Installation / for a period of 10 years after 3 months from date of supply whichever earlier.

- e) Type approval certificate for degree of protection (as specified) as per IEC 60529.
- f) ANSI B1.20.1 Pipe Threads (End Connections (Two pipe version) of meter inlet and outlet confirming / according to ANSI B1.20.1 (NPT and NPTF pipe threads - dimensions)
- g) PESO approval for MIU/AMR of Meter. (As applicable)
- h) ATEX certificate for electrical/electronic items conforming to Zone2, IIB hazardous area use requirement. (As applicable)

All certificates duly verified by renowned Third Party Inspection agency like Lloyds, ABS, SGS, TUV, DNV, BV, Engineers India Limited, or any other Third Party Inspection agency only with prior approval of (Client) /PMC.

6.0 TECHNICAL SPECIFICATION - DOMESTIC GAS METERS

- I. Domestic Gas Meters of size G1.6 (Qmax 2.5 m³/hr; Qmin 0.016 m³/hr), having rangeability of 1:150 or better, for usage for metering of natural gas at a normal operating pressure of 21mbar (g) for domestic customers and maximum operating pressure of up to 200 mbar (g); design pressure 500 mbar (g).
- II. All meters shall be of compact size (As meter has to be used in domestic applications, bidder has to offer the meter with proper cyclic volume size & meeting all the requirements including accuracy), confirm long term accuracy and reliability, robust, maintenance free.
- III. Domestic gas meters shall be G1.6 type. Higher size meter (above G 1.6) meeting the minimum flow requirement and having certification from W&M also acceptable. The meter capacities shall be as indicated in the technical datasheet.
- IV. Index shall be compatible for implementing automatic meter system and preferably be factory fitted with Meter Interface Unit.
- V. Meter shall be painted with electrostatic spray epoxy paint or Polyester powder coating and the paint shall be of approved color and quality.
- VI. The meters shall have corrosion resistant powder coated (inside and outside) of the steel casing.
- VII. Enclosure protection of all meters shall confirm to IP-54 (asper IEC 60529) or better.
- VIII. Metering equipment shall be sealed and shall be able to prevent seal tampering.
- IX. All Meters shall have in-built reverse flow & reverse count restrictor.
- X. The meters shall be supplied with all mounting accessories i.e. metal seal wire, screws, wall-mounting brackets not less than 25 mm width and 5 mm thickness.. End connection shall be protected by Plastic caps.

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The testing at FCRI of sample meters from the particular batch / every batch will be sole discretions of client. However manufacture who is having following valid certificate; inspection at FCRI only if client wants further verification / compliance of supplied meter:

- a) MID - D approval for the testing and manufacturing setup
- b) MID - B approval for design

However if manufacture not having above certification; factory testing facilities evaluate and certified by traceable recognized calibration & testing agency / Third Party Inspection cum assessment agency as define in tender as per the EN 1359 /OIML standard compliance shall be provided by the manufacturer.

7.16 The Inspection cover the test listed in EN1359 latest and shall not limited to the following:

- a) Visual : Facia Plate marking, Arrow marking, Meter Index reading, Seal, Construction & Workmanship, Colour & appearance
- b) Dimensional: Meter Size, End connections (threading), Centre to centre distance of inlet & outlet connection, Powder coating thickness
- c) Fitment & alignment
- d) Calibration : 3 point calibration (Qmin, 0.1Qmax, Qmax), Accuracy testing
- e) Functional & Operational tests : Total mean pressure absorption, Pressure (max Pressure & operation pressure), Max. Flow, Meter Index, Valve (for commercial meters only)
- f) AMR functioning, Handheld unit functioning, Mobile device functioning, Data concentrator Functioning, Data communication / exchange
- g) Leak Test : Body Leak Test
- h) Physical properties / Chemical analysis : Body & internal parts
- i) Enclosure protection : IP certification for Meter
- j) Approvals : Fire resistance type approvals, W&M approval, PESO approval

7.17 **Tampering test procedure (For the meter using magnetic pulse with MIU/AMR)**

MAGNETIC TAMPERING: The meter under test (Gas meter as offered by the bidder) shall be connected via pulse reader.

Following steps are to be followed for the tampering test:

- o STEP-1: Meter under test & Master meter index shall be synchronized with each other before test.
- o STEP-2: Apply some flow into the meter under test & check both Meter under test & Master meter index value. At least the test should be conducted for 20 pulse & both Index should increase equally.
- o STEP3: Now put the magnet (any small capacity & up to 0.2 Tesla) on pulsar and apply same above procedure as given in STEP2. (Apply some flow into the meter & check both the Meter under test & Master meter index value. At least the test should be conducted for 20 pulses & both indexes should increase equally).
- o Step 4: Remove the magnet from pulsar. (Apply some flow into the meter & check the both (Meter under test & Master meter) index value. At least the test should be conducted for 20 pulse & both index should increase equally).

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At the end if the Index value of both the Meter under test & Master meter matched after all above mentioned steps, it will be concluded that there is no impact/tamper for external magnet. Hence offered meter is acceptable.

7.10 Procedure for AMR Compatibility Test

After the MIU is installed and wired properly on the meter follow these steps to verify that the AMR is working properly:

- a) Check the mechanical index reading and the reading on the MIU or at the Server are same.
- b) Check the serial number on the meter body, communication device and server are the same.
- c) Now move the meter index by blowing air or with the help of low pressure instrument air for minimum one meter cube,
- d) Check the variation on the index, MIU, handheld device and on the server.
- e) If the increments on all the places are same then it is demonstrated that the communication is established.

7.19 Procedure for Tamper Alarm Test

Tamper Alarm will be conducted along with Calibration of test for Accuracy of Registration testing. Once the meter passes the calibration test at Q_{min} , Q_{max} , and at $0.1Q_{max}$ flow rate, then the following tests will be conducted on the same apparatus:

- a) Ensure that the communication is established between the MIU of AMR meter with Bidder's proposed server.
- b) Once the communication is established, bring a magnet (up to 0.2 Tesla) near the meter index and keep it there till at least one meter cube of air is passed through it. Tamper alarm should be generated and if the alarm is not generated meter shall be considered as technically not qualified.
- c) Try to remove the MIU from the meter by breaking the seal on removal of MIU the system shall generate alarm for the same and if the alarm is not generated meter shall be considered as technically not qualified.
- d) Go back to step (a) again, if required.

7.20 REJECTION CRITERIA

- a) Not having Valid W&M India certificates for model approval, Manufacturing Sales & Services for Indian manufacturer and Model approval with Import license for foreign manufacturer at the time of bid submission and at the time of supply. For AMC contract; the validity must be for the entire tenure of AMC.
- b) During the Shop Testing any meters fail to meet the desired result as defined in the datasheet shall stand rejected. For sampling plan refer IS 2500: 2000 (or latest) standards.
- c) During independent tested for compliance with (Client) / MECON Technical Specifications like dimensional tolerances, leakage testing, performance, accuracy, retrofitting AMR functioning, AMR meter reading tampering etc. Should the results

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of these tests fall outside the limits specified in (Client) /PMC technical specification, then (Client) /PMC reserves the rights to reject all production supplied from the batch.

8.0 MARKING

8.1 Each gas meter shall be marked / provide label in legible characters, which are permanently visible in accordance with BS EN 1359:1999+A1 Amendment 2006 or 2017 or latest in force for Diaphragm Gas Meters or as per given below for other Gas Meters:

- Name and logo of the manufacturer, along with the model
- Name and Logo of Client
- The serial number and month and year of manufacture
- EN 1359- Type approval Mark & Number / or as applicable for Other meter
- approval number issued by Department of Legal Metrology (W&M) (Govt of India)
- Maximum Flow Q_{max} and minimum flow Q_{min} (For Metering Units)
- Maximum operating pressure
- Nominal Value of Cyclic Volume.
- Ambient Temperature Range
- Gas Temperature Range
- Number and date of EN standard
- Accuracy Class of the meter.
- Direction of flow
- Sticker for safety information on front side of the body of meter

8.2 Client Logo on each of the Meter. Client unique serial number to be marked on the meter as per the standard procedure which will be communicated to the successful bidder. Vendor shall ensure that there is no repetition of serial numbers & each meter shall be given unique serial number.

9.0 PACKING AND SHIPMENT

Supplier shall mention the Packing size to ensure uniformity in delivery conditions of the material being procured. Vendor shall submit the packaging details during offer and also complied with at the time of delivery.

- I. The total packaging system shall be such that it will not get damaged / unintentionally opened during handling, transportation and storage of the boxes. Each device shall be coated properly before dispatch, such that the factory setting cannot be changed on site.
- II. The box containing the individual gas meter shall contain the details of the installation and servicing operating instructions, and the same shall be written in English language. They shall include all relevant information and following in particular:
 1. Instruction manual and Test certificates
 2. Installation, Operation and servicing
 3. Mounting position & instruction
 4. The maximum and minimum operating temperatures
 5. Maximum operating pressure
- III. Each of gas meters shall be protected with plastic end caps on the inlet and outlet end connections of the gas meters. Meter should individually packed in a transparent

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plastic cover (of adequate thickness) to protect the meter from ingress of dirt and water. The meters individual box and packed in such a way to prevent movement during transit. The type of packing of each of the gas meter shall be such that it provides adequate protection against any damage to the meter.

- IV. Each of the boxes of individual gas meter shall be closed / sealed appropriately with a tape, and packing and strength of the box shall be such that same does not get opened or damaged during handling and storing of the same. A set of 4-5 Nos. (Or as deemed suitable by the manufacturer) of individual gas meters shall be packed in a larger box / carton and contents of (larger) box / carton, viz. Description of the gas meter and total quantity of gas meters (in the box), shall be clearly and specifically mentioned (in English language only) on each of the (larger) box as under:
1. Name of manufacturer
 2. Description of material
 3. Purchase Order No.
 4. Total quantity (inside the box)
 5. Date of inspection
- V. The Manufacturer has to ensure that the Inspection Agency apply their mark (stamp / sticker/ embossing applicable as per inspection cum dispatch released certificate) on each box ensuring above mentioned information before dispatch.
- VI. The calibration certificates of each item shall be enclosed within the package box. Each package box shall be tagged with the purchase order number (unique identification is required). The package box shall be suitable for Inland transport or seaworthy (if imported). Necessary precautions and pre-requisites shall be considered by supplier for package delivery to the concern client site / location / workshop.
- VII. In order to facilitate a proper storing of the gas meters, the maximum number of such boxes that are permitted to be stacked one upon the other shall also be clearly and legibly mentioned on the box.
- VIII. Meter mounting accessories like metal seal wire, screws, wall-mounting brackets shall be packed separately and delivered as per despatch lot of meters.

10.0 LIST OF THIRD PARTY INSPECTION AGENCIES

- Tata Projects Ltd.
- Bax Counsel Inspection Bureau Pvt. Ltd.
- Germanischer Lloyd
- ABS Industrial Verification Ltd.
- Certification Engineers International Ltd.
- Dalal Mott MacDonald
- International Certification Systems
- Lloyd Register
- Det Norse Veritas (DNV)
- Bureau Veritas (BV)
- TUV SUD /NORD group
- EIL
- CEIL
- SGL

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11.0 WARRANTY

Warranty period shall be twelve (12) months from the date of commissioning of the equipment or twenty four (24) months from the date of receipt of material at client's stores whichever is earlier. If any defects found in the meter during the warranty period, the meter shall be replaced by the supplier without any cost and time implication to client.

12.0 DOCUMENTS TO BE FURNISHED:

- I. This is a "No deviation" tender; however for any specify deviation or variations in offer from specified standard & acceptance as per contract shall be at the sole discretion of client/PMC.
- II. Following Documents (in English language only) to be submitted with technical bid:
 - a. Approval certificates against specified standard duly verified by TPI.
 - b. Details of manufacturers' quality plan, QA / QC procedure and ISO Certification.
- IV. Along with shipment of materials the vendor shall furnish a copy of the following documents:
 - a) Test certificates confirming the accuracy of registration of each meter in accordance with the requirement of standard.
 - b) Performance & material test certificate and results of all the tests that are carried out in accordance with specified standard & as per manufacturers' quality control procedure and any other relevant certificate as per client / PMC equipments.
 - c) Certificate of compliance against specified standard for all meters along with supply and inspection release note issued by third party inspection agency /PMC /client.
- V) Following is the list of documents required to be sent to (Client) / PMC along with each lot of Gas Meters (*2 sets hard copy & 6 sets of soft copies in CDs*):
 - a) Performance specification and test certificates, test certificates for material properties and chemical composition, calibration certificates of 100% quantity of supplied Meter, internal & final test reports, handling instruction etc.
 - b) GA & Construction drawings, Dimensional & section drawing, Material specifications and technical data sheets, Testing, calibration & Inspection procedures, QAPs. (In English language only)
 - c) Installation, operation, maintenance, recommendations and instruction manual in detail with Catalogue and technical literature of domestic meters in English
 - d) Any other relevant documents required by (Client) /PMC.
 - e) Inspection certificate, material compliance certificate, packing list, released note
 - f) In the final documents, copy of PO/ FOI, Inspection Certificate and Inspection Testing Report of each lot, Dispatch / Receiving details, Guarantee/ Warranty Certificates etc shall be provided in 2 sets (Hard Copy) and 6 Sets in CD (Soft Copy).

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13.0 DATA SHEET - DOMESTIC GAS METERS (G1.6)

Note: Refer various clauses of Technical specifications related to statutory / standards requirements, Inspection, Marking and Packaging, furnished the relevant documents along with the offer / detailed engineering for compliance of data sheet and specifications for Domestic meters.

Complete details with product catalogue, mounting instructions, Weights & Measure certificate, import certificate (in case of foreign manufacturer) and location of meter manufacturing, calibration certification of each meters and test bench valid at the time of testing and calibrations. valid certification as per PNGRB regulatory requirement shall be submitted along with bid. Any non compliance found at the time of inspection, strict action shall be taken against the manufacturer as per the terms and condition of contract. Warranty as per the terms and condition of the contract shall be provided.

NATURAL GAS DOMESTIC METERS	
DATA SHEET NO. : MEC/05/E5/I/DM/D-001	
Service	Natural Gas Metering
Type	Any technology suitable for Domestic Gas Metering of flow capacity / size / accuracy as defined in data sheet & MR (Note -1)
Reference	Compliance as per EN 1359: 2006 / EN 1359:2017 / latest edition in force for Diaphragm Gas Meter / OIML R 137-1 & 2 for Gas Meters; PNGRB requirement (refer T4S) specification
W & M India certificate	Required must be valid at the time of bid submission & valid till the contractual tenure ✓
Installation	Suitable for outdoor/Indoor Installation, Hot and Humid ambient condition, tamper proof and corrosion resistant for a life period of minimum 10 years; suitable for smart meter by retrofitting of AMR/MIU. (Bidder to confirm) ✓
Make & Model number	By vendor
Orientation	Left side inlet & Right side outlet - quantity as per MR/ SOR of tender Right side inlet & Left side outlet - quantity as per MR/ SOR of tender ✓
Mounting	Wall mounted ✓
Flow/ Service	Qmax: 2.5 m ³ /hr, Qmin: 0.016 m ³ /hr or better, Qty. : As per MR
Accuracy	Class 1.5 , ±3%(Q _{MIN} to 0.1Q _{MAX}) ; ±1.5% (0.1 Q _{MAX} to Q _{MAX})
Rangeability	150:1 or better
Calibration	3 Points Covering Qmin, 0.1 Qmax & Qmax as per EN 1359: 2006 / EN 1359:2017 / or latest edition in force/ OIML R137 (Latest)
Cyclic Volume	Minimum (Vender to specify)
Normal Working Pressure	0.02 bar (g)

General Process Conditions

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	Max. Working Pressure	0.038 bar (g)
	Design Pressure	0.5 bar (g)
	Max. Allowable pressure drop	2 mbar
	Density Kg/Sm ³	0.707 to be confirm during detailed engineering
	Operating Temperature	0°C to 45°C Design 50 °C
Body	Case work/ Body	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant powder coated. Suitable clamp for mounting not less than 25 mm width & 5 mm thickness steel casing
	Coating & painting	Powder coating & epoxy painting
	Corrosion protection	Suitable coating on inside and outside of casing.
	End Connections (Two-pipe version)	20 NB NPT(M) inlet and outlet confirming to ANSI B1.20.1 (In case the end connections are differing, bidder to provide suitable adapters of same material of meter or Brass and approved quality to meet the specified end connections)
	Fire resistance	As per EN 1359: 2006 / EN 1359:2017 / or latest edition in force or equivalent
Index	Max. Index reading	Minimum Eight digit : 9999.999 Index with auto reset facility
	Meter interface Pulse output type	Inductive / Magnetic
	Unit	CM (Cubic meter)
	Marking on index dial	(Client name) with Logo and other details as per specification
	Ingress protection	IP54 or better (as per IEC 60529)
Internals	Diaphragm	If quoted Diaphragm meter then material shall be Polyester fabric coated for an endurance life cycle as per EN 1359: 2006 / EN 1359:2017 / or latest edition in force Other Gas Meter - endurance life cycle - OIML R137 standard
	Valve between inlet & outlet	Optional / Accepted with or without valve
	Power supply to Meter Internal valve	If required through MIU battery; Smart metering requirement - Post paid meter (As applicable)
	Centre to centre distance between inlet and outlet connections	To be suitable for 110 mm (To be specified by vendor)
	Other internals	All meter internals shall be Tamper proof & non-metallic to prevent from tampering with any magnet of any capacity
Others Requirement	Leak Testing	Meter pressurized with air at 1.5 MAOP of the meter, immersed in water for observance of Leakage
	Sealing arrangement	Provision to be made by vendor
	Marking	Required as per approval / certification and other details as per specification

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Reverse flow deterrents	Reverse count restrictor to be provided. Reverse rotation of index is not allowed.
RFID Tag	Not required
MID type approval	Optional (Module B & Module D)(Accepted With or Without MID type approval)

Note:

1. The supply meter should be suitable for taking meter reading manually at sites of installation throughout the life of meter (i.e. 10 year) without any external communication/ metering system and making smart meter in future by retrofitting AMR/MIU/ external communication / metering system.
2. For Domestic Diaphragm Gas Meter Compliance to BS EN : 1359:1999+A1 Amendment 2006 or EN 1359-2017 or latest edition in force shall be provided. *(The certificate as per 1359:1999+A1 Amendment 2006 valid as on bid due date than only it will be accepted; otherwise certificate in compliance to EN 1359-2017 has to be provided)*

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Client name & logo		QUALITY ASSURANCE PLAN FOR DOMESTIC / COMMERCIAL DIAPHRAGM GAS METER (SAMPLE)					Project: City Gas Distribution Project.....				
							LOA No:				
							Client: client name				
							Contract No. / PMB				
							Manufacturer:				
							QAP, No. by vendor				
							Rev. No.: 0				
							Date:				
S.No.	Characteristics / Description	Type of Test	Category	Extent / Quantum of Check	Ref. Doc. & Cl.No.	Acceptance Criteria / Norms	Format of Records	Scope			Remarks
								Manufacturer	TPIA	PMC / Client	
1	External Leak Tightness		Test	100%	BS EN 1359: Latest, Clause No. 6.2.2	✓		P	W	W/R	100% Inspection by Manufacturer and 5% Inspection by TPIA
2	External Soundness Test		Test	100%		✓		P	W	W/R	
3	Calibration of Test for Accuracy of Registration Testing	At Qmax Flow Rate	Test	100%	BS EN 1359: Latest, Clause No. 5.1	✓		P	W	W/R	
		At 0.1 Qmax Flow Rate	Test	100%		✓		P	W	W/R	
								P	W	W/R	
4	Pressure Absorption Test		Test	100%	BS EN 1359: latest, Clause No. 6.2	✓		P	W	W/R	
5	Dimensional Inspection	Centre to Centre of End Connections	Visual	100%		✓		P	W	W/R	
		Inlet & Outlet End Connection Size and Threading	Visual	100%		✓		P	W	W/R	
6	Visual Inspection	Fascia Plate Marking	Visual	100%		✓		P	W	W/R	
		Powder Coating Thickness (Min. 40 micron)	Visual (Use DFT Meter)	100%	Technical Tender Specification	✓		P	W	W/R	
		Index Reading	Visual	100%		✓		P	W	W/R	
		Arrow Marking	Visual	100%		✓		P	W	W/R	
		Colour & Appearance	Visual	100%		✓		P	W	W/R	
	Marking & Packing	Visual	100%		✓		P	W	W/R		
7	Mechanical & chemical properties of Body Casing				As per manufacturer's MTC		Conforming to Tender Technical Specifications and BS EN 1359:1999 + A1:2006 or latest	Manufacturer Inspection Report / Laboratory Test Report in compliance to EN 1359 Latest	P	W	W/R
8	Verification of casing thickness recorded against resistance to internal pressure test (type test report)	Verification to be done by using standard thickness measurement instrument. (tolerance of ±0.05 mm)		1 No. per each batch of casing material	As per type test approval certification obtained against resistance to internal pressure test			P	W	W/R	
9	Fire Resistance i.e. Resistance to High Temperature Test		Test		BS EN 1359: Latest, Clause No. 6.5.5			P	R	R	Review of Test Certificates by TPJA / Client
10	Calibration Report for all pressure sensing transmitters		Visual					n	n	n	

2010

client name & logo		QUALITY ASSURANCE PLAN FOR DOMESTIC / COMMERCIAL DIAPHRAGM GAS METER (SAMPLE)						Project : City Gas Distribution Project.....			
								Title : Client : client name : Consultant : PMC name : Manufacturer : Vendor : QAP No. by vendor : Rev. No. : Date :			
S.No.	Characteristics / Description	Type of Test	Category	Extent / Quantum of Check	Ref. Doc. & Cl.no.	Acceptance Criteria / Norms	Format of Records	Scope			Remarks
								Manufacturer	TPIA	PMC / Client	
11	AMR Compatibility Test	-	Test		Technical Tender Specification/approved QAP/ Procedure			P	W	W/R	100% inspection by Manufacturer and 5% inspection by TPIA.
12	Magnetic Tampering Test	-	Test		Technical Tender Specification/approved QAP/ Procedure			P	W	W/R	Inspection by TPIA for the type of model offered
13	Approvals : Fire resistance type approvals, W&M approval, PESO approval, Ingress Protection	-	Doc review		Technical Tender Specification/approved QAP/ Procedure			P	R	R	Review & acceptance based on validity
LEGENDS: R - Review, W - Witness, P - Perform, TPIA - Third Party Inspection Agency											
Single Sample Plan with 1% AQL											
Normal Inspection Level 1 (AO per IS 2500)											
	Ql. No.	Quantity	Sample size	Acceptance Number	Rejection Number						
	1	2 to 500	20	0	1						
	2	501 to 3 200	50	1	2						
	3	3 201 to 10 000	80	2	3						
	4	10 001 to 35 000	125	3	4						
	5	35 001 to 1 150 000	200	5	6						
Notes:											
1)	The above mentioned testing and acceptance criteria are minimum requirements; however, supplier shall ensure that the product also complies the additional requirements as per technical specifications and data sheets.										
2)	The supplier shall submit their own detailed QAP prepared on the basis of the above for approval of Owner / Owner's representative and indicate name of approved TPIA.										
3)	TPIA/PMC/Client shall have right to inspect minimum 10% of all manufacturing activities or as specified above.										
4)	TPIA along with Owner / Owner's representative shall review / approve all the documents related to QAP / Quality Manuals Drawings etc. submitted by supplier.										
5)	TPIA shall also review the test certificates submitted by the manufacturer.										
6)	Supplier shall in coordination with sub vendor shall issue detailed production and inspection schedule indicating the dates and the locations to facilitate Owner / Owner's representative to organise inspection.										
7)	Supplier shall submit meter index format duly signed and stamped.										
8)	TPIA shall review all the reports 100%										
9)	All measuring instruments shall be duly calibrated at the time of inspection.										

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SCHEDULE OF RATES (SOR) - PROCUREMENT OF DOMESTIC METER

All prices to be quoted in Rupees												
Sr.No	Material Code	Description of Items	Quantity (Nos.)	Unit Ex-works Price including packing and forwarding charges (such price to include all costs as well as duties and taxes paid or payable on components and raw materials incorporated or to be incorporated in the goods) including cost of inspection by Third Party agency, mandatory spares etc. (wherever applicable) but excluding GST on finished goods (Rs.)		GST (CGST&SGST/UTGST or IGST) on the finished goods (applicable extra on Col. 4) (Rs.)		*Freight Charges per Unit excluding GST (Rs.)	GST (CGST&SGST/UTGST or IGST) freight charge (per unit)	Unit Ex-Works Prices including GST but excluding freight (Rs.)	Unit Freight including GST (Rs.)	Total FOT site price including Freight & GST, (Rs.)
				%age	Amount	%age	Amount					
			(A)	(B)	C	D	E	F	G	H=B+D	I=E+G	J=(H+I)*A
1		Item A (Domestic Gas Meters) Design, Detailed Engineering, fabrication/ manufacturing, assembly, inspection (third party inspection by certifying agency) for supply of Natural Gas Meters including packaging, transit insurance, handling, transportation, loading / unloading at sites/ designated store, documentation etc and providing all related services conforming to respective data sheets enclosed with tender										
1.1		DOM MTR, G1.6 (Left hand entry / Right hand entry) FL(MAX) 2.5 MB. FOR DETAILS, REFER ATTACHED SPECIFICATION SHEET	5000									
		Total										

*NOTE Destination to considered as Rourkela for quoting freight charges

client name & logo		QUALITY ASSURANCE PLAN FOR DOMESTIC / COMMERCIAL DIAPHRAGM GAS METER (SAMPLE)						Project : City Gas Distribution Project..... LOA No:, VIL&M/SP&M Name:, Consultant : PMC name..... Manufacturer :, Vendor:, QAP No. by vendor:, Rev. No.: 0 Date:			
S.No.	Characteristics / Description	Type of Test	Category	Extent / Quantum of Check	Ref. Doc. & Cl.No.	Acceptance Criteria / Norms	Format of Records	Coops			Remarks
								Manufacturer	TPIA	PMC / Client	
10)	Calibration certificates of all measuring instruments shall be reviewed by TPIA at the time of inspection, along with Master Calibration Certificate (from NABL for India or Similar Lab from outside India) of the measuring instruments from which the instrument is calibrated. The same shall be submitted along with submission of inspection report, and the same shall be traceable to national / international standards. The Master Calibration Certificate shall be checked as a must at the time of inspection and submitted along with the inspection report.										
11)	After satisfactory inspection, TPIA to apply their mark (stamp / sticker / embossing etc.) on each gas meter for testing. TPIA has also to apply their mark with unique identification (e.g. stickers which cannot be removed / embossing / stamp along with details such as batch no., date of manufacture, serial no.) on the outer box / gunny bags carrying the inspected materials after verifying the information mentioned in the Technical Tender Specification.										
by Manufacturer			by Contractor				by Client/PMC/TPIA				
(Name / Signature / Date / Stamp)			(Name / Signature / Date / Stamp)				(Name / Signature / Date / Stamp)				

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(A Government of India Enterprise)

**CITY GAS DISTRIBUTION NETWORK PROJECT
FOR
BENGALURU**

January 2021



GAIL Gas Limited
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM

CONTENT

<u>Sl.No.</u>	<u>Description</u>
SECTION - I	TECHNICAL SPECIFICATION FOR SMART METERS & ASSOCIATED UNITS
SECTION - II	MATERIAL REQUISITION
	&
	DATA SHEETS OF SMART METERING SYSTEM



GAIL Gas Limited
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM

SECTION - I
TECHNICAL SPECIFICATION
FOR
SMART METERS AND ASSOCIATED UNITS



GAIL Gas Limited
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM

1.0 INTRODUCTION

GAIL Gas Limited, a wholly owned subsidiary company of M/s GAIL (India) Limited, is engaged in development of CNG & City Gas Distribution Networks (CGDN) at different Geographical Areas in the country for distribution of CNG and PNG to various consumer segments. Presently, GAIL Gas Limited is implementing CNG & City Gas Distribution Network (CGDN) to supply Natural Gas to domestic, commercial, industrial and automobile Consumers distributed over the Geographical Area (GA) of Bengaluru city.

GAILGAS Limited had placed a work order on MECON for rendering PMC services for city gas distribution project. This technical specification covers the requirement of Smart Metering System for CGDN, Bengaluru.

2.0 SCOPE OF WORK

Bidder's scope includes design, engineering, manufacture, assembly, inspection, supply, testing and commissioning of the total system complete in all respects and satisfactory stable operation of domestic non-prepaid type smart meters for domestic smart metering. Bidder's scope of work shall include the following:-

1. Design, engineering, manufacturing, assembly, factory testing, inspection (as defined in the specification), marking & packaging, supply of domestic smart metering system comprising of domestic natural gas meters, Meter Interface unit (MIU) / Automated Meter Reader (AMR), with software, including forwarding & packaging, insurance, handling, transportation, loading / unloading at sites/ designated store, integration & data exchange of supplied smart meters with existing smarter metering server i.e. Head End Software (HES) or new cloud server and further integration with client's existing MDM / SAP software with suitable software configuration / modification, commissioning for smooth operation from smart metering / AMR system and providing all related services, documentation, commissioning spares, training.
2. It is preferred to integrate the supplied smart meters with the existing smart metering server / system. Any required hardware / software upgradation, software modification / configurations in the existing server shall be in the Bidder's scope. However, if bidder does not integrate the supplied smart meters with existing metering system HES and opts to have their separate metering system / software, then bidder shall provide cloud based server services with web-enabled application software, having 7-year subscription (from the date of each lot of receipt of supply at site) & subsequently renewable as per client's requirement. In case of the cloud server, cloud hosting, development, subscription, software & licenses charges for proper function of system including liasoning will be provided by the bidder. Integration with data communication / exchange from cloud metering server with the MDM/SAP server of the client, shall be in the Bidder's scope.
3. Bidder shall provide end-to-end communication solution for all supplied meters, including all required provisions like GPRS/LoRa/NBIoT/Sigfox or any other suitable technology, for seamless communication between supplied smart meters at various locations / sites and



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smart metering server (cloud server or existing server at GAIL Gas, Bengaluru) on secured communication link.

For the offered end-to-end communication network, the subscription, rental charges etc. towards first 7-years from the date of each lot of receipt of supply at site will be in the scope of the bidder. Bidder shall ensure that such subscription account shall be transferrable to client after the said period of 7-years and shall be of renewable type for after 7-years, during which the charges shall be paid by the client.

4. Regarding seamless data transfer from the existing HES/ cloud server to MDM / SAP; the MDM / SAP will fetch Smart meter data from existing HES / cloud server via interface and perform meter reading, consumption validation, editing and estimation. Bidder has to ensure that server (existing/cloud server) to which communication is made by the supplied meters, provides alerts, alarms and information on abnormalities of data to MDM/SAP.
5. Configuration / mapping / synchronization of meter MIU/AMR, for communication / data exchange with metering software server and further communication / data exchange to client's MDM /SAP software server including manpower, tools & tackles shall be in bidder's scope.
6. Bidder's scope shall also include ensuring the collection of meter data (walk-by method and/or fixed method) from field upto client's MDM /SAP for a period of 7-years including manpower, tools & tackles.
7. Bidder shall provide comprehensive AMC service for the supplied smart metering system, for a period of 7-years, including manpower, tools & tackles.
8. Bidder shall provide required mounting accessories, commissioning spares, etc.
9. Bidder shall provide training to Purchaser's personnel pertaining to handling of meters, Meter Interface Units (MIU) / Automatic Meter Recorder (AMR), associated software at purchaser's place.
10. Bidder shall comply with PNGRB, OIML, local statutory regulations of Legal metrology of 2009 and Karnataka Legal Metrology (Enforcement) rules, 2011 and latest amendments and Acts during contractual period.
11. Bidder shall also specify and include in scope any hardware/software which are not specially mentioned but are required to complete the integration, commissioning, functioning of Smart metering system.
12. Bidder shall share the protocol at all levels for implementation of smart metering system.
13. Bidder shall furnish all documentation including manuals & final as-built documents.
14. Hiring of Third Party Inspection Agency (TPIA) for factory inspection is in Bidder's scope.
15. Whenever meters along with MIU/AMR are being supplied, Bidder shall ensure that the meters are initialized & synchronized prior to dispatch.
16. If the Bidder offers Walk-by type system with HHU, the minimum 10 Nos. HHU with mobile & loaded Apps (considering 20% meters on walk-by & 80% meters on fixed type) shall be supplied with end-to-end communication solution. Necessary configuration/integration with the Metering server shall be in the scope of the Bidder.



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SMART METERING SYSTEM

3.0 EXCLUSIONS

Installation of the gas meter.

4.0 CODES AND STANDARDS

All meters shall comply with the requirements of PNGRB guidelines. In case of conflict between PNGRB and other codes, PNGRB guidelines shall prevail. Unless otherwise specified, the latest editions of the standards mentioned herein this specification, including all addenda and revisions, shall apply. The Bidder shall furnish (along with the technical bid) a copy of the approval documents, certificates (in English language only) for each of the offered model, for compliance to the requirements of following standards.

4.1 Natural Gas Meter (Document shall be submitted along with the bid)

- a) Diaphragm Meters shall comply with EN-1359: 2006 (or latest). Other Gas Meters shall comply with PNGRB regulatory T4C and applicable standards. In compliance of the respective standard, the Bidder shall submit all the relevant documents / reports / certificates
- b) Model approval certificates from legal metrology - Weights and Measurement Department in India for the natural gas meters and valid certificate shall be produced.
- c) For imported natural gas meters, import license / clearance from weights and measurement department of India to be submitted.
- d) IP Certificate.

4.2 MIU/AMR system (Document shall be submitted along with the bid)

- a) License from government bodies for use of RF band.
- b) Equipment type approval from concerned authorities like Wireless Planning & Coordination Wing (WPC) / WEEE / RoHS
- c) Import license from WPC, if imported.
- d) ATEX certification Zone 2 for MIU/AMR Modules
- e) PESO/CCOE Nagpur certification, if required
- f) IP Certificate.

5.0 DESIGN BASIS

- 5.1 Walk By/ Drive By type Smart Metering System shall send data from Meter Interface Unit to a Handheld Unit/Android mobile through Radio-Frequency and from Handheld Unit/Android mobile to remote server through GPRS shall be implemented for geographical locations having independent houses and low-rise / high-rise apartments. The Walk-By type Smart Metering System may be offered based on the Technology adopted by the Bidder.
- 5.2 Fixed/Wireless type Smart Metering System shall send data from Meter Interface Unit to remote server through Radio-Frequency service gateways of GPRS/ LoRa / NBIoT / Sigfox shall be implemented for geographical locations having independent houses and low-rise / high-rise apartments.



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- 5.3 Domestic consumers Smart Metering system shall be non-prepaid type with MIU / AMR communicating with remote server. The meter MIUs shall be common for walk-by type and fixed type smart metering system. The RF-based MIU shall have the same features, allowing walk-by readouts and fixed system readouts.
- 5.4 The MIU shall transfer the data to Handheld Unit / service gateways (GPRS/ LoRa / NBloT / Sigfox). The Handheld Unit / service gateways (GPRS/ LoRa / NBloT / Sigfox) shall be able to communicate and transfer data to the remote server over the secured communication mode with data encryption to prevent intruder access
- 5.5 It is preferred that Bidder, directly integrate the supplied smart meters with the existing smart metering software in HES server at the GAIL Gas control room with suitable modification (as may be required) for data exchange and further establishing data exchange with client's MDM / SAP software. The existing HES software supports Smart Cap protocol. Modifications to existing architecture would not be allowed.
- 5.6 In case bidder offers separate metering system / software, then bidder shall provide cloud based server services with web-enabled application software and establish integration & data communication / exchange from cloud metering server with the MDM/SAP server of the client.
- 5.7 GAIL Gas is using MDM Solution. The existing MDM solution (Oracle's Meter Data Management & Oracle Smart Grid Gateway) fetches Smart meter data from existing HES (Head End software) via interface and push it to the SAP ISU after performing meter reading consumption validation, editing and estimation. HES will provide alerts, alarms and abnormalities data to billing software.
- 5.8 The existing smart metering / AMR system software has been supplied by M/s AIUT, Poland. The details of the same are given in clause 6.1. Further details as necessary, will be provided to the successful bidder.
- 5.9 The existing telecom services have been provided by M/s Bharti Airtel Limited (Airtel India).
- 5.10 The Smart metering system shall ensure communication compatibility between Smart metering unit & server for any addition / replacement of Smart metering system units/components
- 5.11 For all proposed system i.e. by using existing server / cloud based server, Bidder's proposed Smart Meters (with Head end systems) must have compatibility with existing MDM / SAP software, to ensure seamless integration and smooth functioning.
- 5.12 Proposed Smart Metering System (with cloud based server) have to publish Interfaces via Web Services / other Integration mode for sharing Smart Meter Reading data in XML format at required Regular / Ad-hoc interval to GAIL Gas MDM/ SAP system.
- 5.13 Proposed Smart Metering System (with cloud based server) should be able to publish common set of Integration Interfaces for bulk/individual Smart Meter Reading data retrieval.
- 5.14 Proposed Smart Metering System (with cloud based server) should be capable of sharing HES Meters alerts, alarms and abnormalities as part of response to MDM / SAP Solution.
- 5.15 During the implementation / augmentation, bidder shall not jeopardize the existing system and its communication between meters at field and servers (HES / MDM) at GGL control room.



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SMART METERING SYSTEM

6.0 GENERAL SPECIFICATION

6.1 EXISTING SYSTEM

Existing Smart metering system contains following layers:

- a) MDM / SAP supervisory system that provides business functions for utility: billing, prepaid, cut off, meter commissioning.
- b) HES data collection system that manages timely readout retrieval, communication links & configuration management, data decoding and decrypting. HES – MDM Interface is part of HES that provides bidirectional interface compliant with MDM requirements.
- c) HES Mobile Application fitters/ servicemen tool that allows for automated (integrated with MIU), traceable, onsite device commissioning, diagnostics, replacement, removal.
- d) MIU Meter interfacing unit that collects pulses converting them to gas consumptions, stores it and communicates on GSM/GPRS with Metering Server.

A GAS METER

Type : Diaphragm Meter
Application : Domestic & Commercial

B MIU

Domestic Metering

Make : AIUT
Model : APULSEX373
Module type : Retrofit type
Frequency : 050 to 067 MHz
Battery : Replaceable
Display : Inbuilt LCD
Protocol : Smart Gas Metering Protocol

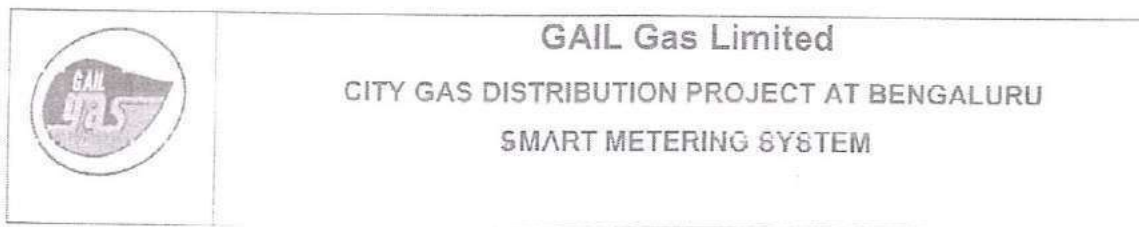
Commercial Metering

Make : AIUT, Poland
Model : OKO 8373
Module type : Retrofit type
Communication : GPRS/SMS
Battery : Replaceable
Display : Inbuilt LCD
Protocol : Smart Gas Metering Protocol

C HAND HELD UNIT (Domestic Metering)

Make : AIUT
Model : Arange 6070
Comm. Mode : RF (MIU to Communication Device)
Display : LCD
Battery : Rechargeable

D MOBILE DEVICE (Domestic Metering)



Type	:	Android Mobile
Comm. mode	:	Bluetooth (Communication Device to Handheld)
Software	:	Preloaded with application software
Display	:	Meter Readings

E DATA CONCENTRATOR UNIT (DCU) (Domestic Metering)

Make	:	AIUT
Comm. Mode	:	SMS / GPRS (GSM 900/1800 MHz)
Power	:	Self powered (No external power supply)
Battery	:	Lithium Battery (replaceable)

C MIU Protocol – Physical layer

Short range coverage is assured by radio LAN protocol. In order to assure initial or future compatibility all protocols should use standard license free SRD bands with minimal radio physical layer (ISO OSI model) specification:

- RF Frequency range : 863 - 870 MHz (ISM) ⁽¹⁾
- RF Modulation type : GFSK
- Frequency Deviation : 2,172 kHz
- Channel spacing : 25 kHz
- Receiver bandwidth : 19.2 kHz
- Receiver category : 2
- Equipment type : 1 (digital messages transfer)
- 2nd Harmonic radiations < -36 dBm
- 3rd Harmonic radiations : < -36 dBm
- Receiver Sensitivity : -108,2 dBm
- Frequency stability : < + ? 5 kHz
- Transmission Speed : 4800 bps
- Maximum radiated power e.r.p. : < 25 mW
- Antenna type : Integrated, whip
- Addressing modes : Unicast ⁽²⁾, Broadcast ⁽³⁾, Multicast ⁽⁴⁾
- Transmission Range : > 1.5 km ⁽⁵⁾
- Maximum RF link duty-cycle : <1% per single device
- Number of nodes per single concentrator : 1000 ⁽⁶⁾

Notes:

- ⁽¹⁾ Preconfigured 866.5 MHz for IMR devices. Alarm frequencies (868.600 - 868.700, 869.200 - 869.400 MHz and 869.650 - 869.700 MHz) are excluded.
- ⁽²⁾ Allows sending data to a single in-range device. Other devices don't receive the data.
- ⁽³⁾ Allows sending data to all in-range devices.
- ⁽⁴⁾ Allows sending of data to selected in-range device. Devices outside of selection don't receive the data.
- ⁽⁵⁾ Measured with maximum transmission power in open space
- ⁽⁶⁾ The environment might impose additional conditions limiting the number of devices that can be handled by a single concentrator

The radio protocol allows for multiple functions, including:

- Transmission of meter readouts
- Remote device configuration



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- Transmission of logged device events
- Transmission of alarms, including chassis open and anti-tampering active
- Initiation & reporting of actions, including leakage test, open valve & close valve actions
- Transmission of archived meter readouts
- Remote firmware upgrade
- Clock synchronization
- Fixed and walk-by operation
- Encryption and data signing

D. SERVER

Domestic Consumer Server details:

2x Intel Xeon E5 , 2.6 GHz Server
Windows 2012, VMware vSphere ESXi Hypervisor
Microsoft SQL Server 2014 with SQLCAL (DAQ)
RAID 6 controller
Cisco ASA 5512-X IPS Firewall

Commercial Metering Server

HP DL180 Server – Redundant
2x 500GB HDD
RAID 6 controller
Cisco ASA 5512-X IPS Firewall
Windows 2012, VMware vSphere ESXi Hypervisor
Microsoft SQL Server 2014 with SQLCAL (DAQ)
HES – Smart Gas Metering Console

E. TELECOM SERVICES

Telecom services are provided by M/s Bharti Airtel Limited.

At Data Center

- 1) Airtel provides MPLS link from its nearest MPLS POP to customer data center
- 2) Bandwidth of Backhaul link will be 2 Mbps to start with,
- 3) Link terminated on customer CPE
- 4) MPLS Link availability will be 99 %.

At Mobile

- 1) Airtel provides 2G/3G SIM
- 2) Private APN will be configured for given SIM's for given SIM.
- 3) Integration between APN & MPLS VPN done by Airtel which give a complete security end to end & will ride over MPLS instead of Internet
- 4) Static IP address to SIM is assigned Static from a fixed pool
- 5) Traffic will reach Data Center via Airtel MPLS Link

F. METERING SYSTEM

The existing smart metering server are located at GGL Control room in Bangalore. For the existing domestic metering, Smart Metering / AMR systems of AIUT make is implemented. AMR device communicate with the metering servers. The AIUT make smart metering system



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have the capacity for catering 2,00,000 domestic consumers of which presently 1,20,000 domestic consumers are tagged to the existing metering systems. The HES Smart Gas Metering software for Domestic Consumers can be integrated with billing software.

The Smart Metering System / AMR, has the following features:

- 1) User-friendly and easily configurable, modify/add meters.
- 2) Capable of collecting the meter readings data from MIU units.
- 3) Compatible for integration of any MIU.
- 4) MIU units easily configurable remotely, as per GAIL GAS requirement.
- 5) Capable of synchronizing with client's MDM server software, as per GAIL GAS requirement.
- 6) Capable of scheduling the meter readings, as per GAIL GAS requirement.
- 7) Generate an alarm for any tamper of the MIU installed on the site, for communication failure, for consumption volumes above or below the preset threshold values, for no-consumption over configurable period, for low battery, for reverse meter detection & backflow volume, for unread meter. The alarm can be reset after being acknowledged, either through remote terminal or on-site by authorized person (in case of RF communication failure) The preset values can be changed by GAIL GAS personnel authorized for the same.
- 8) APP shall be compatible to work in other android mobile with security feature.

Further details on the existing system, will be provided to the successful bidder.

6.2 SPECIFICATIONS OF NEW METERS

A. NATURAL GAS METER

1. Natural gas meters shall be of compact size, confirm long term accuracy and reliability, robust, maintenance free.
2. Domestic gas meters shall be G1.6, diaphragm type or other technology suitable for domestic metering (meeting the requirement of flow, accuracy, rangeability, pressure, etc. of G1.6 meter as per data sheet). (Refer MR and datasheets).
3. The meter index of diaphragm meter shall be compatible for implementing automatic meter system and the meter index shall be factory fitted.
4. Metering equipment shall have physical seal to prevent tampering.
5. Meters shall have in-built reverse count restrictor.
6. Diaphragm Meter shall have pulse generating mechanism compatible to AMR. The Pulse generating mechanism / Meter reading shall be unaffected / provide alert on AMR for tamper by an external magnet. Bidder shall furnish the confirmation. The same may be verified at any stage before/during/after installation for meter with AMR, meeting the tamper detection requirement.
7. Electronic meters shall have signal Generation system shall be as per meter manufacturer standard.
8. The meters shall have corrosion resistant powder coated (inside and outside) casing. Enclosure protection of all meters shall confirm to IP-65 or better.
9. Meter shall be painted with electrostatic spray epoxy paint or Polyester powder coating and the paint shall be of approved color and quality.



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10. The meters shall be supplied with all mounting accessories i.e. tamper-proof seals, screws, wall-mounting brackets etc. End connection shall be protected by Plastic caps. However, the details for the same shall be finalized during detailed engineering.
11. The life of the meter shall be at least 20 years.

B. AUTOMATIC METER READING (AMR) SYSTEM

1. The communication system between smart meters & remote servers shall be on Open protocol in order to ensure communication compatibility between smart metering unit & server for any addition/replacement of smart metering system units/components.
2. Meter Interface Unit (MIU) for diaphragm gas meters shall be Inductive / Magnetic Pulse type and AMR shall be generally retrofit type. The MIU shall capture the pulses from the Meter Index using Inductive / Magnetic Pulse Technology.
3. AMR shall generate tamper alerts in the event of tamper by external magnet, avoid missing pulse and deviation/ mismatch in index & billing data. Bidder shall furnish the confirmation. The same may be verified at any stage before/during/after installation for meter with AMR, meeting the tamper detection requirement.
4. AMR for other technology (electronic) meters, the pulse/signal type shall be as per meter manufacturer standard with AMR integral or retrofit type.
5. AMR shall be able to communicate and transfer data to remote server on secured communication mode with data encryption to prevent intruder access.
6. AMR supplier shall share with GGL, the specification of protocols, used at all levels in the Smart Metering System.
7. Overall dimensions of AMR device shall be as minimal as possible. AMR shall have physical seal to prevent tampering.
8. Bidder shall guarantee the performance of AMR device over an ambient temperature upto 55°C and a relative humidity of 85%. Enclosure protection of all AMR shall confirm to IP-54 or better and shall be suitable for installations in hazardous area classification zone 2 (ATEX Category-3).
9. MIU shall be lithium battery powered. Bidder / AMR manufacturer shall warrant that any battery provided and installed in the AMR unit shall be free from design and manufacture defects. AMR Battery Life shall be at least 7-years from the date of supply. Bidder shall submit the design calculation along with the offer in support of battery design life.
10. The AMR battery shall be encapsulated in such a way, so as to avoid tampering or arbitrary disconnection of power supply.
11. The AMR shall be capable of storing minimum 60 days daily data logs having daily flow or meter reading, battery status, occurrence of tamper events, AMR health status and communication failure.
12. AMR shall be suitable for both walk-by system (using handheld unit) & fixed type system (using GPRS/ LoRa / NBloT / Sigfox service gateways).
13. The RF based end-point communication module shall capture the pulses from the Meter Index and transfer the data to Handheld Unit / service gateways (GPRS/ LoRa / NBloT / Sigfox) as configured in the vicinity. Handheld Unit / service gateways (GPRS/LoRa / NBloT / Sigfox) shall be able to communicate and transfer data to the remote server over the secured communication mode with data encryption to prevent intruder access.
14. All through, the data transmission between MIU to Remote Server shall be encrypted to prevent intruder access.
15. AMR with GPRS/LoRa / NBloT / Sigfox communication module features:



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- a) AMR shall be able to communicate to a gateway which shall send data to the server. The communication between server and AMR may be bi-directional. The communication between AMR and gateway shall be point-to-point.
 - b) AMR shall be able to communicate with the Fixed Type Network in a secured manner (AES 128/256-bit Encryptions).
 - c) AMR shall transmit 2-data packets per day to upload daily data logs (Example: Two Time Slots 11 AM & 11 PM).
 - d) In case of communication with gateway fails, the AMR shall store data and send that data to server on resumption of network.
 - e) The line of sight range of the transceiver module to a gateway shall not be less than 5 Km. The range of communication to a gateway shall not be less than 1 Km even in densely populated areas with plentiful obstructions.
 - f) The AMR modules along with the Gateways shall form a simple star network. The AMR unit should be capable of communicating using network protocol to the Gateway.
16. AMR Characteristics & Functionality
- a) Accurate, synchronized operation
 - b) Energy conserving operation
 - c) Remote device configuration
 - d) Transmission of logged device events
 - e) Transmission of alarms, including chassis open and anti-tampering active
17. The AMR system shall provide the following alarms as minimum:
- Any tamper events.
 - Communication failure.
 - Low battery
 - MIU removal.
 - No consumption for more than a configurable tenure.
 - Unread meter.
 - Volume below / above pre-decided threshold values.
 - Any other unforeseen consumption, etc.
18. Any services related to configuration of MIU and hand held device for remote meter reading and from data from hand held to client's Server in a suitable file format as desired, is in bidder's scope.

C. METERING SERVER

1. It is preferred that, bidder shall integrate the supplied smart meters with the existing smart metering system / software with data exchange from smart meters into existing server with suitable software / firmware / hardware modification (as required) and also integrate & establishing data exchange with client's MDM / SAP server for billing. Necessary upgradation of hardware & software components (like storage, RAM, HES software license, HES Modifications, GPRS/ LoRa/NB-IoT/Sigfox integration, etc.) as required shall be in scope of the bidder.
2. If bidder does not integrate with existing metering system and opts to have separate metering system / software HES, then bidder shall consider separate cloud server service. Bidder shall integrate the supplied smart meters with cloud based smart metering system server & software and establish data exchange from smart meters to the cloud based metering server



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- and further the cloud based metering server shall be integrated and shall exchange data with client's MDM / SAP server for billing.
3. In-case of cloud server, bidder shall provide cloud server services for domestic smart metering with web-enable application software, cloud hosting, development, subscription, software & licenses charges including required accessories for proper function of system.
 4. The cloud services hired shall be in the name of client GAIL GAS LTD. Necessary liasoning and assistance in subscribing the cloud services and coordinating with service provider for proper functioning shall be in scope of the bidder. The subscription for the cloud services for first 7-years (from the date of each lot of receipt of supply at site) shall be scope of the bidder. Subsequently the cloud services shall be renewable as per client's requirement, during which the charges shall be paid by the client. However the cloud application software developed for smart metering system shall be having licenses and any software patches for proper functioning shall be in the scope of Bidder.
 5. Configuration / mapping / synchronization of meter MIU/AMR for communication / data exchange with metering software server and further communication / data exchange to client's MDM /SAP software server.
 6. Bidder shall securely process, analyse and manage the collected meter data.
 7. The capacity & performance of the cloud server shall suite to match the requirements of smart metering system.
 8. The cloud server services employed for the smart metering system shall have high availability of servers and ensure continuous availability of data at client's MDM / SAP server for billing.
 9. The cloud services shall adhere to the following:
 - a) Cloud Service Provider (CSP) shall be preferably a GOI cloud services like - National Cloud by NIC / Railtel. However cloud services from third party shall can also be considered.
 - b) The CSP shall guarantee the data related to this project will reside in India only
 - c) The CSP/Service Provider shall meet the security requirements applicable to CSPs/Service Providers published (or to be published) by MeitY or any standards body setup / recognized by Government of India from time to time and notified to the CSP/Service Providers by MeitY as a mandatory standard.
 - d) CSP shall have certification/compliance to following standards:
 - i) ISO 27001 - Data Center & cloud services should be certified for the latest version of the standards.
 - ii) ISO/IEC 27017:2016 Code of practice for information security controls based on ISO/IEC 27002 for cloud services and Information technology
 - iii) ISO 27018 - Code of practice for protection of personally identifiable information (PII) in public clouds.
 - iv) ISO 20000-9 - Guidance on the application of ISO/IEC 20000-1 to cloud services.
 - v) Security requirements indicated in the IT Act 2000.
 - e) CSP/Service Provider shall maintain privacy, security, safeguard & confidentiality of data.
 - f) CSP/Service Provider shall notify GGL promptly in the event of security intrusions, security breach by unauthorized persons, requests from foreign government agencies for access to data.
 - g) The cloud services offered for this project shall be strictly inline with the guidelines laid by Ministry of Electronics and Information Technology (MeitY), GoI.
 10. The cloud servers based on its roles- viz. Database, Web Service, Communication, Application etc., shall be considered with backup server and firewall protection. The cloud



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- server- Processors, RAM and Storage, etc. shall be designed to suit metering requirements. Associated supporting software, application software with licenses shall also be considered.
11. Cloud based Server shall be capable of generating reports like --
- a) Average Yearly, Half-yearly, Quarterly, Monthly, Daily Consumption pattern
 - b) Cumulative Quantity of Zero consumption meters
 - c) Cumulative Reading coverage
 - d) Low/ Peak consumptions
 - e) Details of portion wise manual reading collected in billing cycles
 - f) Tamper/Event Log
 - g) Exception Report
- However the same shall be finalised during execution.
12. The application software deployed for Smart Metering System / AMR, shall have following features as minimum:
- a) Capacity to cater newly supplied quantity of domestic consumers, commercial consumers
 - b) User-friendly and easily configurable, modify/add meters.
 - c) Capable of collecting the meter readings data from MIU units
 - d) Compatible for integration of any MIU.
 - e) MIU units shall be easily configurable remotely, as per GAIL GAS requirement.
 - f) Capable of synchronizing with client's MDM server software, as per GAIL GAS requirement.
 - g) Capable of scheduling the meter readings, as per GAIL GAS requirement.
 - h) Generate an alarm for any tamper of the MIU installed on the site, for communication failure, for consumption volumes above or below the preset threshold values, for no-consumption over configurable period, for low battery, for reverse meter detection & backflow volume, for unread meter. The alarm can be reset after being acknowledged, either through remote terminal or on-site by authorized person (in case of communication failure) It will be possible to change the preset values by GAIL GAO personnel authorized for the same.

D. COMMUNICATION SERVICES

- a) Bidder shall provide end-to-end communication between smart meters installed at various locations / sites and smart meter server (i.e. existing server or cloud based server) on secured communication with data flow in secured manner preventing data tamper & security breach.
- b) Bidder shall provide end-to-end communication solution for all supplied meters, including all required provisions like GPRS/ LoRa/NBIoT/Sigfox or other suitable technology, for seamless communication between supplied smart meters at various locations / sites and smart metering server (cloud server or existing server at GAIL Gas, Bengaluru) on secured communication link.

For the offered end-to-end communication network, all charges including subscription, one-time / fixed charges, rentals, usage charges and any other charges by the service provider, shall be in bidder's scope. Bidder shall provide this service for first 7-years (from the date of each lot of receipt of supply at site). Bidder shall ensure that such subscription account shall be transferrable to client after the said period of 7-years. Subsequently the communication services shall be renewable as per client's requirement, during which the charges shall be paid by the client.



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- c) Coordinating with service provider for proper functioning and ensuring continuous availability of meter data at metering server and at client's MDM / SAP shall be in the scope of the Bidder.
- d) The Service Gateway LoRa/NBLoT/Sigfox or other suitable technology used for end-to-end communication shall be proven technology locally for AMR based communication and having wide coverage over the Geographical Area (GA) of Bengaluru city.
- e) For GPRS / LoRa/NBLoT/Sigfox connectivity, the performance shall be 99.5% on a best effort basis and data accuracy.
- f) In case the primary solution goes down, system shall have a failover mechanism.
- g) Gateway service provider shall provide the confirmation assuring network SLA of 99.5 % availability.
- h) Bidder shall ensure that the gateway of the service provider in the vicinity of individual & group of smart-meter(s) installed location has the capability & capacity to handle meter data.
- i) Bidder shall ascertain the network signal strength of communication service provider at the installed meter location. In the event of shadow / dark-spots / no-coverage area found, bidder shall take up with communication service provider to build / strengthen the network coverage in that area. Such meters shall be configured for walk-by readout with HHU.
- j) AMR shall transmit 2-data packets per day to upload daily data logs (Example: Two Time Slots 11 AM & 11 PM).

E. OPERATIONAL & MAINTENANCE

The service under Post Warranty comprehensive Maintenance Agreement services shall broadly comprise of :

- a) Bidder will be responsible for Operation & Maintenance of the system subsequent to successful installation and commissioning of Smart Metering System with Smart Meters.
- b) Bidder shall provide comprehensive AMC service for the supplied smart metering system for a period of 7-years from the date of each lot of receipt of supply at site.
- c) AMC service shall cover the smart metering system, smart meters, metering software, its sub-system and any associated hardware, software, including manpower, tools & tackles.
- d) The bid shall be made for 7-years duration and the price validity shall be available for the entire period of contract.
- e) The comprehensive maintenance shall include costs of all material required for repairs or replacement of meter(s) and all allied parts with all labor required for removing of defective meter and fixing of tested meter and regular annual maintenance of all meters fixed along with its associated software. During the Guarantee period if any meter becomes defective or not found as per specification, the same shall be repaired/replaced free of cost by the Bidder.
- f) Replacing the fault devices at field like- meters, MIU, battery, HHU is in scope of bidder. Bidder shall ensure to maintain sufficient inventory of meters, MIU, battery, HHU, consumables, etc. in good & healthy/workable condition. Bidder shall timely replace the faulty inventory.
- g) Bidder shall provide the service on all calendar days of the year (irrespective of holiday).



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- h) Bidder shall attend the complaints within 4hrs of request in the same day. The defective meter/item shall be removed and new tactod motor/item shall be installed within 2-days, failing which a penalty per meter per day of delay shall be levied and recovered from the Bidder. In case, the Bidder is unable to solve the complaint or if the meter/item is damaged beyond repairs the Bidder shall replace the meter/item with new meter/item and inform the concern officials in 2-hours.
- i) Bidder shall be equipped with all the tools, tackles, spares and experienced personnel for carrying out the repairs & replacement.
- j) Bidder shall have an online-portal / dashboard / system-methods which shall be accessible for GGL to raise request, view request status, view resolution, issue escalation and generate report.
- k) Battery life remaining (40%, 25% & 10%) indication shall be reflect on portal which shall be accessible to GGL also.
- l) Bidder shall update any firmware or software during the comprehensive maintenance of the complete system.
- m) In the event of any malfunction of the system hardware / system software, experienced service engineer shall make the system healthy
- n) Bidder shall maintain communication with GGL through reports with respect to mal-functionality / mal-practices / mishandling / faultiness of the acct.
- o) Bidder shall constantly be checking the functionalities of the servers and also the data synchronization between the Meters and Servers and Troubleshoot the hardware and software.
- p) Bidder shall carryout Configuration / mapping / synchronization of meter MIU/AMR for communication / data exchange with metering software server and further communication / data exchange to client's MDM /SAP software server for the rectified / replaced meter AMR
- q) Bidder shall provide the service for collection of meter data (walk-by method, fixed method) from field installed meters upto client's MDM /SAP with required deployment of manpower, tools & tackles.
- r) Meter data collection by walk-by method shall be monthly and Meter data collection by fixed method shall be daily.
- s) Bidder shall deploy the required manpower with tools & tackles for field meter data collection service by walk-by method and ensure the meter data availability upto client's MDM /SAP of all meters on walk-by system & fixed system.
- t) In the event of dark-spots / no-coverage by communication service provider in an area, the meter reading shall be obtained by walk-by readout with HHU.
- u) Bidder shall securely process the collected meter data, as per GAIL GAS requirements.
- v) PENALTY CHARGES DURING WARRANTY PERIOD AND AMC PERIOD

Sl.No.	Description	Time allowed for rectification	Penalty charges in case of delay beyond stipulated period/days.
1	Cloud Server (Hardware Software Login) Failures	24 Hrs	Rs.1000/- per Day
2	Communication Link Failure	12 Hrs	Rs.1000/- per Day



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3	Meter Failure	48 Hrs	Rs.1000/- per meter per day
4	Non-availability of Engineers	8 Hrs	Rs.1000/- per Day

7.0 MARKING & PACKAGING:

Each device (Meter, MIU) shall be marked in legible characters, which are permanently visible (stickers to be avoided) with at least the following information:

- Name and logo of the Manufacturer, along with the model
- Serial number
- Month and year of manufacture
- CE marking, EN-1359 or applicable standard Marking, W&M Marking
- Maximum Flow Q_{max} and minimum flow Q_{min} (For Metering Units)
- Gas temperature range, Ambient temperature range, Storage temperature range
- Maximum operating pressure
- Accuracy class of the meter, e.g. Class 1.5
- Direction of flow
- Name and Logo of the Client

Each device shall be sealed properly before dispatch, such that the factory setting cannot be changed on site. Each meter/MIU/HHU (along with the instruction manual) is to be Individually packed in a transparent plastic cover (of adequate thickness) to protect the meter/MIU/HHU from ingress of dirt and water, and the same shall be packed in an individual box. The description of the contents of each of these boxes including meter/MIU/HHU serial number shall be clearly mentioned on each of the individual box. A set of these individual boxes (5-10 Nos., as the case may be) shall be packed in a larger box; and the description of the contents of the larger box shall also be clearly mentioned on the box. The quantity of the meter/MIU/HHU in the larger box shall be such that the box can be easily handled and stored, and it does not get damaged during the same.

8.0 QUALITY ASSURANCE

The Supplier will provide details of their quality assurance procedures during the assembly of the units and for final inspection following testing.

The Bidder shall get the QAP approved by the GGL/MECON before the Inspection.

GAIL GAS/MECON reserves the right to visit the Supplier's facilities without prior notice, and inspect test records and witness assembly and testing in progress.

9.0 GUARANTEE PERIOD

The devices shall be guaranteed against malfunction and degradation through corrosion or faulty workmanship as per the conditions of contract. GAIL GAS/MECON also reserves the right to charge the supplier all costs incurred by GAIL GAS for rectifying or replacing defective units within the guarantee period.

10.0 TECHNICAL EVALUATION REQUIREMENTS



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- 1) The Supplier is required to submit to GAIL GAS Limited/MECON the details of the items to be supplied, including the manufacturing standards, model number, accuracy specifications, AMR details, AMR integration details, communication, details of server (if considered), along with bid for our technical evaluation of bid. All the technical documents / catalogues etc., to be submitted along with technical bid shall be in English Language only.
- 2) The data sheet should be filled up completely and should be enclosed with the Technical Bid.
- 3) Compliance with the Technical Specifications must be confirmed by the bidder.

11.0 INSPECTION PLAN

- 1) Testing & Inspection shall be carried out as per the Technical Specifications of GAILGAS/MECON & EN1359 / OIML / MID for Natural gas meters at the works of the manufacturer as per approved QAP.
- 2) Equipment type approval shall be obtained for AMR from concerned authorities like Wireless Planning & Coordination Wing (WPC), WEEE / ROHS
- 3) Third Party Inspection is to be included in the quoted price. Inspection as per approved QAP shall be carried out on each lot by a reputed third party inspection agency like Lloyd's, ABS, SGS, TUV, DNV, BV, EIL, or any other Third Party Inspection agency with prior approval of GAIL GAS/MECON.
- 4) GAILGAS/MECON representative or Third party inspection agency appointed by GAILGAS/MECON, if any, may also carry out inspection again during manufacturing / final inspection at the works of the manufacturer.
- 5) Bidder shall furnish all the material test certificates, internal test / inspection reports for 100% material at the time of inspection of each supply lot of material.
- 6) Each natural gas meter shall be calibrated for at least three point calibration, in line with the requirement of EN-1359 / OIML / applicable standards and the test results shall be satisfactory in line with EN-1359 / OIML / applicable standards.
- 7) Review of Calibration certificates for all the measuring instruments at the time of inspection, i.e., used for checking and testing, along with the Master calibration certificate of the measuring instruments from which the instruments is calibrated.
- 8) All meters/MIU should be sealed properly by the manufacturer after final inspection clearance and before dispatch. Meters found in an unsealed condition will not be accepted at GAIL GAS stores.
- 9) Even after third party inspection, GAIL GAS/MECON reserves the rights to select a sample of meter/MIU randomly from each manufacturing batch & have these independently tested for compliance with GAIL GAS/MECON Technical Specifications like dimensional tolerances, leakage testing, performance, accuracy, etc. Should the results of these tests fall outside the limits specified in GAIL GAS/MECON technical specification, then GAIL GAS/MECON reserves the rights to reject all production supplied from the batch.
- 10) If the performance of any of the sample meter/MIU is not in compliance with the acceptance norms of the respective standards, then that lot of respective item will be rejected.
- 11) Meter shall be tested for Meter reading not tampered by external magnet.
- 12) The Inspection of shall include the following tests / reviews, but not limited to:



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- a) Visual : Facia Plate marking, Arrow marking, Meter Index reading, Seal, Construction & Workmanship, Colour & appearance
- b) Dimensional: End connections size & threading, Centre to center distance of inlet & outlet connection, Powder coating thickness
- c) Calibration: 3 point calibration (Qmin, 0.2Qmax, Qmax) Accuracy testing
- d) Functional & Operational tests: Total mean pressure absorption, Meter index, AMR pulse generation check, AMR alarms.
- e) External leak test & external soundness test (1.5 MAOP)
- f) Physical properties / Chemical analysis test report : Body & internal parts
- g) Calibration report for all measuring instruments / equipment.
- h) Enclosure protection : IP certification for Meter, IP certificate for AMR
- i) Statutory Approvals: Fire resistance type approvals, W&M approval, PESO approval, ATEX certification for AMR, WPC certificate of AMR.
- j) The inspection procedure (testing and reviewing procedures) for the above shall be finalized during approval of QAP.

12.0 DOCUMENTS TO BE FURNISHED WITH SUPPLY (Minimum 3 sets)

Following is the list of documents required to be sent to GAIL GAS/MECON along with the first lot of smart metering system:

- a) Performance specification and test certificates, calibration certificates (100%, for each of the Meter/MIU).
- b) Technical data sheets, Testing & Inspection procedures, QAPs. (In English language only)
- c) Installation, operation, maintenance, recommendations and instruction manual in detail
- d) Approval documents (issued by reputed third party inspection agency) for establishing conformity to the requirements for installations in hazardous area classification zone 2 (ATEX category 3).
- e) In case of import, the AMR device from the outside of the India, the Bidder has to submit the operating license/importing license of the same.
- f) Architecture / Protocol / Software, etc.
- g) Any other document required to operate the Smart Metering System successfully.
- h) Any other relevant documents required by GAIL GAS/MECON.



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SECTION -II

MATERIAL REQUISITION & DATA SHEETS FOR SMART METERING SYSTEM

21/07/2019



GAIL Gas Limited

**CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM**



GAIL GAS

CITY GAS DISTRIBUTION PROJECT

FOR

BENGALURU CITY

SMART METERING SYSTEM

**MATERIAL REQUISITION (MR)
&
DATASHEETS**



GAIL Gas Limited
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM

MATERIAL REQUISITION (MR)

SL. NO.	DESCRIPTION	UNIT	QTY
	<ul style="list-style-type: none"> • Design, detail engineering, manufacturing, assembly, supply, factory testing, inspection of domestic Smart Metering System comprising of Natural Gas Meters, MIU/AMR including marking, packing, forwarding, insurance, handling, transportation, loading / unloading at sites / designated store, documentation, mounting accessories, commissioning spares, training, etc. • Providing all related services like Configuration / mapping / synchronization of meter AMR for communication / data exchange with metering software server and further communication / data exchange to client's MDM /SAP server. • Integration & data exchange of supplied smart meters with existing metering system server or cloud based metering server with web-enabled application software and from existing/cloud metering server to MDM/SAP software with suitable software configuration / modification, commissioning with smooth operation for Smart Metering/Automatic Meter Reading (AMR) system. If bidder provides cloud based server the cloud hosting, development, subscription, software & licenses charges, liaisoning, integration of cloud metering server with MDM/SAP with data communication / exchange shall be in Bidder's scope. • Provide end to end communication including all required provisions like GPRS/LoRa/NBLoT/Sigfox or any other suitable technology, for seamless communication between supplied smart meters at various locations / sites and smart metering server (cloud or existing at GAIL Gas) on secured communication link. • Comprehensive AMC service for the supplied smart metering system & collection of meter data (walk-by method, fixed method) from field upto client's MDM /SAP for a period of 7-years including manpower, tools & tackles. <p>The above activities complete in all aspects, as per Technical Specification.</p>		
GROUP-A	DOMESTIC SMART METERING SYSTEM		
A.1	Domestic Gas Meter G1.6 (design pressure upto 200mbar) for Left side inlet & Right side outlet, fitted with AMR module suitable for walk-by type (RF) cum fixed type (LoRa/NBLoT/Sigfox) Smart Metering System and shall communicate & exchange data with smart metering system software.	Nos.	50,000 1 000
A.2(a)	Option1: Integration with Existing Metering Server Integrating of supplied Smart Meters (50,000 Nos. Meters) in Existing Metering Server with suitable hardware & software modification / software development and integration to client's SAP. Inclusive of necessary hardware & software upgradation	Lot	1
A.2(b)	Option2: New Cloud Metering Server Integrating of supplied Smart Meters (50,000 Nos. Meters) in Cloud based Server with web-enabled application software and integration to client's SAP. Inclusive of cloud hosting, development, software & licenses charges [One-time / fixed / Initial charges]	Lot	1
A.3	One-time / fixed / Initial charges for Communication between Smart Meter & Metering server on GPRS/ LoRa / NBLoT / Sigfox network for fixed type metering	Meters	50,000
A.4	Rentals / usage charges for: Communication between Smart Meter & Metering server on LoRa / NBLoT / Sigfox network for fixed type metering; for 7-years duration	Meters	50,000
A.5	Comprehensive Maintenance Service of Smart Metering System for 7 years duration	Meters	50,000
A.6	Collecting the meter data from field upto client's SAP server including manpower, tools & tackles for 7-years duration	Meters	50,000



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SMART METERING SYSTEM FOR DOMESTIC CONSUMERS – WALKBY TYPE, FIXED TYPE		
GENERAL	Service	Natural Gas
	Type	Diaphragm / Other technology meter like electronic meter suitable for domestic metering & AMR system for domestic non-prepaid service
	Reference	Diaphragm meters- Compliance as per B3 EN-1359:2006 (or latest) PNGRD regulatory T4S Other technology meters- Compliance as per PNGRB regulatory T4S and applicable standards
	Standard	As indicated in Clause 4.0- Codes and Standards
	Make & Model No.	Vendor to specify
	Installation	Suitable for outdoor/Indoor installation, tamper proof, corrosion resistant for life period of 20 years
PROCESS CONDITIONS	Mounting	Wall / Pole mounted. Mounting accessories to be provided
	Flow/ Service	G1.6: Qmax: 2.5 m ³ /hr, Qmin: 0.016 m ³ /hr, Qty. : As per MR
	Accuracy	Class 1.5 [Qmin-0.1Qmax ±3%, 0.1Qmax-Qmax ±1.5%]
	Rangoability	150:1 or better
	Cyclic Volume	Minimum (Vender to specify)
	Normal Working Pressure	0.02 bar (g)
	Max. Working Pressure	0.038 bar (g)
	Design Pressure	0.2 bar (g)
	Max. Allowabic pressure drop	2mbar as per EN 1350:2006 (or latest)
	Density Kg/Sm ³	0.73
	Operating Temperature	0°C to 45°C Design 55 °C Storage 60 °C
Flow Direction	As per M I I and to be marked on meter body.	
BODY	Case work/ Body	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant powder coated steel casing
	Corrosion protection	Suitable coating on inside and outside of casing.
	End Connections (Two-pipe version)	20NB NPT(M) inlet and outlet conforming to ANSI B1.20.1 (In case the end connections are differing, bidder to provide suitable adapters of Brass to meet the specified end connections)
	Fire resistance	As per EN 1359 (Latest) or equivalent
INDEX	Max. Index reading	99999.999 Index with auto reset facility
	Unit	CM (Cubic meter)
	Ingress protection	IP 65 or better
	Pulse output type	Diaphragm Meters: Inductive / Magnetic Other technology (electronic) meters: Signal as per meter manufacturer standard
INTERNALS	Diaphragm	Diaphragm Meter: Polyester fabric coated with rubber on either side of equipment for an endurance life cycle of 80,000 cum. Other Meter: Endurance life cycle of 80,000 cum. Endurance test report as per relevant standard to be submitted.
	Valve between inlet and outlet	NA
	Power supply to valve	NA
	Centre to centre distance between inlet and outlet connections	110mm
	Other internals	All meter internals shall be non-magnetic to prevent from tampering with external magnet
OTHERS	Leak Testing	Meter pressurized with air at 1.5 MAOP of the meter, immersed in water for observance of leakage
	Sealing arrangement	Provision to be made by vendor
	Marking on the meter	Required



GAIL Gas Limited
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
SMART METERING SYSTEM

AUTOMATIC METER READING (AMR)	Reverse flow deterrents	Reverse count restrictor to be provided.
	Make & Model No.	Vendor to Specify
	Frequency carrier	866.5 MHz (865-867 Mhz)
	AMR type	MIU shall be suitable for Walk-by type (using HHU) and Fixed type (using GPRS/ LoRa/NBLoT/Sigfox)
	Communication MIU to Server for Walk-by type	MIU to HHU: RF Wireless communication HHU to Server: Through GPRS
	Communication MIU to Server for Fixed type	GPRS/ LoRa / NBLoT / Sigfox
	Communication Mode	Secured communication with data encryption
	Protocol	Open
	Radiated Power	Vendor to Specify
	Transmitted Power	Vendor to Specify
	Conformity	Equipment Type Approval (ETA) from Wireless Planning & Coordination Wing (WPC)
	Input Pulse characteristics	Diaphragm Meters: Inductive / Magnetic Other technology (electronic) meters: Signal type as per meter manufacturer standard
	Operating Temperature	0°C to 45°C Design 60 °C
	Ingress Protection (IP)	MIU: IP 55 or better
	Alarms	Tamper, Low Battery, Communication Failure, Device removal, No consumption, Unread meter, Volume below / above pre-decided threshold values, unforeseen consumption
	Broadcast Radio Range	Walk-by: RF range >500 Meters with Line of Sight Fixed: LoRa/NBLoT/Sigfox range >5000 Meters with Line of Sight
MIU Memory capacity	Minimum 60 days daily data Readings	
Power Supply	Self-powered by inbuilt lithium battery MIU Battery Life: Vendor to specify	
Battery type	Replaceable / Non-replaceable	

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GAIL GAS LIMITED
CITY GAS DISTRIBUTION PROJECT AT BENGALURU
PRICE SCHEDULE

BID DOCUMENT NO: MEC/
ITEM : DOMESTIC SMART METERS

Sl. No.	Item Nos	Description of items	Unit	Quantity	Harmonized System Nomenclature (HSN) code	Unit price				Amount (INR)	Amount (in words)	
						Unit Ex-works Price including Packing, Forwarding and GST on materials but excluding inland transportation upto FOT site (INR/Mtr.)	0	7	8 a			9 = (6+7+8)
1		<ul style="list-style-type: none"> Design, detail engineering, manufacturing, assembly, supply, factory testing, inspection of domestic Smart Metering System comprising of Natural Gas Meters, MDM/AMR including marking, packing, forwarding, insurance, handling, transportation, loading / unloading at sites / designated sites, documentation, mounting accessories, commissioning spares, training, etc. Providing all related services like Configuration / mapping / synchronization of meter AMR for communication / data exchange with metering software server and further communication / data integration & data exchange with web-enabled application software and for application cloud based metering server with suitable software configuration / modification / commissioning server to MDM/AMR software with suitable software configuration / modification system. If bidder provides cloud based server the cloud hosting, development, subscription, software & licenses charges, liaisoning, integration of cloud metering server with MDM/AMR with data communication / exchange shall be in bidder's scope. Provide end-to-end communication, including all required provisions like QRSY, LoRaNB/IoT or any other suitable technology, for seamless communication between supplied smart meters at various locations / sites and smart metering server (cloud or existing at GAIL Gas) on secured communication link. Comprehensive AMC services for the supplied smart metering system & collection of meter data (walk-by method, fixed method) from field upto client's MDM/AMR for a period of 7-years including manpower, tools & tackles. <p>The above activities complete in all aspects, as per Technical Specification.</p>	3	4	6	0	7	8 a	9 = (6+7+8)	10	11 = (9 x 4)	12
<p>GROUP: DOMESTIC SMART METERING SYSTEM</p>												
A												
1	A.1	Domestic Gas Meter G1.6 (design pressure upto 200mbar) for Left side inlet & Right side outlet, fitted with AMR module suitable for walk-by type (RF) cum fixed type (LoRaNB/IoT/Sigfox) Smart Metering System and shall communicate & exchange data with smart metering system software.	Nos.	1,000								
2	A.2(a)	Option1: Integration with Existing Metering Server Integrating of supplied Smart Meters (1000 Nos. Meters) in Existing Metering Server with suitable hardware & software modification / software development and integration to client's SAP. Inclusive of necessary hardware & software upgradation	Lot	1								
3	A.2(b)	Option2: New Cloud Metering Server Integrating of supplied Smart Meters (1000 Nos. Meters) in Cloud based Server with web-enabled application software and integration to client's SAP. Inclusive of cloud hosting, development, software & licenses charges (One-time / fixed / initial charges)	Lot	1								
4	A.3	One-time / fixed / initial charges for: Communication between Smart Meter & Metering server on GPRS/LoRa / NB-IoT / Sigfox network for fixed type metering	Meters	1000								
5	A.4	One-time / fixed / initial charges for: Connect / Upgrade New Smart Meter & Metering server on LoRa / NB-IoT / Sigfox network for fixed type meters. for 7-years duration	Meters	1000								
6	A.5	Comprehensive Maintenance Services of Smart Metering System for 7-years duration	Meters	1000								
7	A.6	Collecting the meter data from field upto client's SAP server including manpower, tools & tackles for 7-years duration	Meters	1000								

Annexure II

EVALUATION CRITERIA

SL NO	DESCRIPTION	PARAMETER	DOCUMENTS REQUIRED	Marks
1	FINANCIAL STRENGTH (2017-18,2018-19,2019-20)	The cumulative turnover of the bidder for last 3 years achieved by the bidder as per their audited financial results		
		100 to 150 Crores	Copy of the Audited Balance Sheet of the last 3 financial years	2
		150 to 200 Crores		4
Above 200 Crores		6		
2		Net worth of the bidder should be positive as per the last 3 financial audited financial results		
		UP TO 5 Crores	Net worth certificate for last 3 years from CA of the bidder	1
		5 TO 10 Crores		3
Above 10 Crores		5		
3		Cumulative Profit of the bidder for the last 3 financial years		
	UP TO 10 Crores	Profit and loss statement of the last 3 financial years	2	
	10 TO 15 Crores		4	
Above 15 Crores	6			
4	Manufacturing setup	The bidder is having complete manufacturing set up in India	Detailed description of the facilities and resources available with the bidder/OEM	5
		The bidder/OEM is having complete manufacturing setup outside India		3
5	No of years of experience	Experience in supply of Gas meter		
		3 to 5 years	Copy of Work order/Purchase order along with completion certificate/satisfactory performance certificate from client for the work completed with contact details	1
		5 to 7 years		3
More than 7 years	5			
6	No of Meters supplied during Last 2 years	5 Lakhs to 7 Lakhs	Copy of purchase orders /Work orders with quantity supplied by the bidder	2
		7 Lakh to 10 lakhs		4
		above 10 Lakhs		7

7	Exclusive Tie up.	Bidder is willing for exclusive tie up with ITI Limited to transfer technology for manufacturing		
		If Yes	Self declaration duly signed by authorized signatory	5
		If No		0
8	AMR Solution	The bidder is having their own complete AMR solution	Evidence to prove the same(Performance certificate from existing customers)	5
		The bidder is having agreement with AMR solution provider	Copy of agreement between the bidder and AMR solution provider valid for 7 years along with performance certificate from the customers.	3
9	Manufacturing Capacity of the bidder/OEM Per year	2 Lakhs to 3 Lakhs	Self declaration & Detailed description of the facilities and resources available with the bidder	2
		3 Lakh to 4 Lakhs		3
		4 Lakh to 5 Lakhs		4
		>5 lakhs		6
Total				50

ANNEXURE - III
CHECK LIST

(to be filled by bidder and submitted along with the bid)

slno	Description of Documents	Whether enclosed or Not
1	Name and address of the Bidder with contact details: (Ref Clause 4 a)	YES or No
2	Certificate of Incorporation/ Registration details of the Company attached? (Ref Clause 4 b)	YES or No
3	Whether copies of all other statutory registration certificates including PAN, GST etc., attached? (Ref. Clause 4 c)	YES/ NO
4	Whether audited balance sheet of last 3 years submitted as part of the bid (Ref. 4 d)	YES/ NO
5	If bidder is an authorized agent, whether authorization letter from OEM to undertake this business with ITI is enclosed? (Ref. Clause 4 e)	YES/ NO
6	Whether Self declaration & Detailed description of the facilities and resources available with the bidder/OEM along with the details of annual manufacturing capacity is enclosed. (Ref. Clause 4 f)	YES/ NO
7	Whether self declaration expressing willingness for having exclusive tie-up with ITI Limited is enclosed. (Ref. Clause 4 g)	YES/ NO
8	Whether the Product Brochure/ Technical literature/Process flow for the proposed DOMESTIC/COMMERCIAL GAS METERS AND SMART METERING SYSTEM and Project proposal describing the solution, process flow, system capabilities, design plan with time schedule etc.submitted? (Ref. Clause 4 h)	YES/ NO
9	Whether Self declaration agreeing for Transfer of Technology and manufacturing support to be submitted along with bid. (Ref. Clause 4 i)	YES/ NO

10	Whether Self declaration for providing exclusive manufacturing & marketing rights to ITI (Ref. Clause 4 j) .	YES/ NO
11	Whether Signed copy of RFP document attached. This shall be considered as the bidder's clause by clause compliance to the RFP (Ref. Clause 4 k)	YES/ NO
12	Whether bidder has been black-listed at any time by any customer? Self declaration of bidder in this regard enclosed? (Ref. Clause 4 l)	YES/ NO
13	Whether Copies of purchase orders received for the Domestic/commercial gas meters (with/without AMR) system and Client certificates mentioning the satisfactory performance of the supplied equipment within India for the last 3 years (Ref Clause 4m)	YES/ NO
14	Signed Integrity Pact attached (Ref. clause 4n and Annexure IV)	YES/ NO
15	Name of authorized signatory for signing the Bid document along with Power of Attorney(Ref Clause 4o)	YES or No
16	All required documents , certificates and self declarations as mentioned in the evaluation criteria (Annexure II) (Ref Clause 4p)	YES/ NO
17	Copies of all certificates of the product complying with the GGL SoR & Spec. (Ref Clause 4q)	YES/ NO
18	Self Declaration stating that the bidder/OEM is not from a country which shared land border with India (Ref Clause 4r)	YES/ NO
19	Whether the EMD and Tender fee with details are enclosed(Ref Clause 5.3)	YES/ NO

**Signature of the bidders'
Authorized representative**

(Seal)

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 No.....

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

BETWEEN:

ITI Limited ,.....having its Registered & Corporate Office at ITI Bhavan, Dooravaninagar, Bangalore - 560 016 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 WITNESSETH 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 Act 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 BIDDER/ 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 person 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 origin 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)

7.1 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 demand from 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..... toweeks 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 be 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)/ Contractor(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)