SECTION – IV

SCOPE OF SUPPLY INCLUDING TECHNICAL SPECIFICATIONS & DATA SHEET AND SPECIAL CONDITIONS OF CONTRACT [SCC]

TECHNICAL SPECIFICATION FOR METERING & REGULATING STATION (MRS)

This document describes in detail the technical scope of work, scope of supply and responsibilities of Bidder for procurement of Metering & Regulating station inside a cabinet arrangement (Single stream with bypass arrangement) skid for Gasonet.

Scope covers Engineering design, Manufacturing, Installation and commissioning along with necessary documents.

- **Scope of Supply**

1. Design, Engineering, Fabrication, Testing, commissioning and transportation of Metering Regulating Skid with metal sheet canopy (Gas filter vessel, Pressure Reduction Skid, Main line full bore ball valve, Pipe, Flanges and fittings, NRV, Transition fitting, CRV etc.) testing and commissioning as per scope and specification mentioned in document. Refer P&ID for more details.

2. Inspection of skid as per EN 10204- 3.1 Certification

3. Supply of RPD Meter with EVC (Electronic Volume Corrector) & data logger.

- **Codes and Standards**

Design and terminology shall comply, as a minimum, with the latest edition prior to the date of bid enquiry of following codes, standard practices and publications:

- PNGRB Technical Standard for CGD network
- IGE/TD/13
- ANSI B 1.20.1 – Pipe Threads
- ASME B 16.5 – Steel pipe flanges and flanged fittings
- ASME B 31.8 – Gas transmission and distribution piping systems
- DIN – 43760 Temperature Vs Resistance curve for RTDs
- IEC 801 – Electromagnetic compatibility for industrial process measurement and control equipment
- BS EN-50054 – Electrical apparatus for the detection and measurement of combustible Gases General requirements and test methods
- NEMA 4 & 7 – National Electrical Manufacturer's association
- ISO 6967/GPA2145-GPA2172 Natural Gas – Calculation of Calorific Value, Density and Relative Density
- ISO 170125-Calibration of all primary and secondary instruments.
- ISO 6974/6975 – Natural Gas-determination of composition with defined uncertainty by gas chromatography & Natural gas & extended analysis – gas chromatographic method.

- ISO6124/6143 -Traceability of calibration gas of gas chromatograph.
- EN 334- European Standard for Gas pressure regulators up to inlet of 100 bar
- EN 14382-European Standards for Safety systems.
- AGA – American Gas Association, Gas measurement committee.
- AGA Report No. 10 Speed of sound in Natural Gas & other Related Hydrocarbon Gases.
- AGA Report No. 8 Compressibility and Super-compressibility for Natural Gas and other Hydrocarbon Gases. Transmission Measurement.
- AGA Report No. 5 Energy Calculations in Natural gas

Typical Quality Assurance Plan:

Vendor shall submit QAP for review and approval, Typical QAP is attached for reference. Inspection of SKID as per EN 10204- 3.1 Certification.

General Specifications:

- The installation should be designed to pass the maximum designed gas flow rate at the lowest expected inlet pressure and the designed outlet pressure.
- The meter and governing components should be designed not in isolation, but as a single installation. Normally both should be sized for the same load and consideration must be given to the effect that each may have on the other.
- Gas velocities in pipe work must not exceed 20 meters / second up to the inlet of the filter and 40 meters / second downstream of filter, when the maximum flow rate occurs at the lowest expected inlet pressure. Wall Thickness shall be calculated as per PNGRB Standard.
- The noise level at a distance of 1 meter from the MRS should not exceed 85 dBA, and materials selected should be suitable to prevent erosion at high velocities.
- Valves body, bonnet, cover and / or end flanges components made of cast iron and / ductile iron (as per ASTM A395) shall not be used.
- Each stream shall have the capacity to supply 100% of the flow at the minimum available inlet pressure. The impurities that are likely to occur and may be carried over with the gas are filtered in this block. Normally, the Degree of filtration shall be 5 micron @ 99.8% efficiencies.
- In case of RPD meter conical filter size shall be installed at the upstream of meter. Provision should be made in the design of pipe work to enable removal of strainer for cleaning and inspection.
- Meter should have adaptability to Electronic Volume Converters (EVC) Devices
- Meter body: Corrosion resistant Steel or Aluminum or other suitable material for pressure requirement and outdoor installation.

- Meter shall be registered manufacturer with Director of Legal Metrology, Government of India. In case the bidder is importing the offered model of RPD meter from overseas (i.e., from outside India), the bidder shall furnish a copy of import license issued by Indian authorities, along with the technical bid. Bidder shall submit the type approval stamped and verified from Legal Metrology for RPD meter with EVC.

- Pipe work and fittings (including flanges) shall be of seamless type and as per API 5L Gr.B (latest) and ASTM A234 Gr.WPB (latest) & ASTM A105 (latest).

- All the welded joints should be 10% radio graphically examined and acceptance criteria should comply with ASME BPV Code, Section VIII (latest) / API 1104.

- Minimum Dry Film Thickness (DFT) after specified dry time shall be 100 microns.

- A protecting cabinet should be provided to cover the MRS and to avert the ingress of water. It should be constructed with durable, corrosion resistant and non-inflammable materials and should have adequate strength so that it should not get damaged / deformed during handling, transportation and installation. Color of Canopy shall be finalized during detailed engineering and same shall be finalized by GASONET.

- Regulator vents should protrude through the side cabinet wall only and terminate with 45-degree pipe cut to avoid rain water ingress.

- Adequate cut-out should be provided at appropriate location on the cabinet such that the readings of the counter of the Meter as well as the reading of the Pressure Gauge are easily visible from outside.

- HYDRO TESTING - Hydro testing of the MRS/PRS shall be carried out using water as the testing medium. The test pressure shall be 1.5 times the design pressure. The holding time for the test shall be 2 hours.

- Tightness test of the MRS/PRS shall be carried out at operating pressure, the test medium shall be air for up to 7 bar. The holding time for the test shall be 1 hours. Further Tightness is to be checked using NG with the incremental pressure of 7 barg stage wise. A minimum 30 minutes of holding time is to be kept at each stage.

- Full inspection by radiography shall be carried out on all butt weld joints. The acceptance criteria shall follow API 1104.

- The copper jumper (flat of 3 mm thickness and appropriate width) shall be provided at each flange connections. Ends of copper jumper shall be such that it will be removed only after opening the studs provided. The inlet and outlet matching flanges/ companion flange/ Restriction Orifice plate/ Transition fitting (as the case may be) with blind, stud, nut and gaskets shall be provided.

- Manufacturers shall furnish the details of foundation and anchoring/ grouting pockets requirement. Suitable hole shall be provided for anchoring/grouting the Skid. Anchor fasteners/ foundation bolts of adequate strength shall be supplied by the bidder.

- PERFORMANCE GUARANTEE /warranty period -18 months from the date of delivery or 12 months from the date of commissioning, whichever is earlier.

- The spare parts required in the warranty period (18 months from the date of delivery or 12 months from the date of commissioning, whichever is earlier) should be supplied free of cost.

PROCESS PARAMETER

Category	Reference P&ID Number	Flow Rate (SCMD)	Inlet Pressure (Kg/cm2g)	Outlet Pressure (Kg/cm2g)	Type of Flow Meter	Qty.
RPD Meter Based Metering Skid	**P&ID- 1**	**Refer P&ID**	**04**	**2 to 2.5**	**RPD Meter with EVC**	**As per SOR**

- **P&ID is given in tender is indicative. However, Sizing is to be done by bidder and submit during tender bid submission.**
- **Metering Skid shall be designed as per T4S standard.**
- **Evaluation shall be done Item wise.**

Note: The successful bidder will be required to supply the MRS in the quantity mentioned in the above table or as per Annual Rate Contract order (ARC order) in case of splitting of quantities during the contract period. However, the quantities are indicative and may be interchanged in more or less proportion depending upon requirement and as per the instruction of GASONET within the overall limit of the contract value at same rate, terms and conditions.

DATASHEETS,
PIPING AND INSTRUMENTATION DIAGRAM
&
QUALITY ASSURANCE PLAN

NOTE: PIPING INSTRUMENTATION DRAWING (P&ID) & QAP IS ATTACHED SEPERATELY.

DATASHEET OF RPD METER	
Subject	**Description**
Meter Type	Rotary Positive Displacement Type Meter
Service	Natural Gas
Make & Model	To be specified by Vendor
Qty	Vendor to Specify
Maximum Operating Pressure	19 Bar
Normal Operating Pressure	Refer P&ID
Working Temperature Range	5 Deg C to 55 Deg C (Ambient & Gas Temp.)
Rangeability	1:50 or Better
Accuracy	±2% (Qmin to 0.2 Qmax) ±1% (0.2 Qmax to Qmax)
Maximum Index reading:	999999.99
Repeatability	Better than +/- 0.5%
Unit	Cubic Meter
Reverse flow Restrict	Essential. If not in-built non return valve to be supplied
Casing	As per applicable codes, Tamper proof & corrosion resistant Aluminium or Steel suitable for Indoor/outdoor installations
Connection Orientation	Multi Position
Meter Internals (Impellers, Impeller Shaft, Bearing, Gears (Timing & Reduction, Magnetic / Inductive coupling, O-rings / Gaskets)	Non-Corrosive, tested low noise, friction less, endurance for minimum 20 years life & external tamper proof. Plastic components not to be used in Meter.
Installation	Suitable for Outdoor Installation, Tamper proof, water weather proof and corrosion resistant for a life period of 20 years.
Ingress Protection	IP 65 or Higher
Safety Approval	ATEX
Area Classification	Zone 1, Group IIA / II B, T3
End Connections	Class 150 in accordance with ASME B 16.5
Flange to Flange Dimension	Vendor to Specify
Approved to	EN-12480 or equivalent The meters shall be approved by India Metrological Department (Model Approval)
Pulse Output	Vendor to Specify
Pressure tapping & Temperature Element	Inbuilt Pressure Tapping & Temperature Element
Volume Correction	EVC can be inbuilt with RPD meter
Note:	
1. The selected meter shall be suitable for Custody Transfer. Vendor to submit Custody transfer approval certificate from laboratory which can provide the same or MID certificate	
2. The meters shall be type approved by weights and measures department and Vendor shall furnish Legal Metrology Certificate issued by Weights & Measures, India along with certified calibration curve of individual meters.	
3. Bidder to provide Calibration Certificate and Accuracy at atmospheric pressure with air for the following flow rates: Qmin, 0.2 Qmax, 0.5 Qmax, 0.70 Qmax and Qmax. It can be vary based on Manufacture requirement.	
4. In case of RPD meter conical filter size shall be installed at the upstream of meter. Provision should be made in the design of pipe work to enable removal of strainer for cleaning and inspection.	

5. Necessary restricted orifice suitable for the respective RPD shall be provided by the bidder.
6. Suitable Oil with each Meter and all necessary accessories
7. The Meter shall be indelibly marked with details of Max. Flow, Pressures range, direction of flow, name of the manufacturer, model, unique serial number, Date of manufacturing etc.
8. The Vendor shall submit, along with the offer, the manufacturing standards, Model number, performance curves, and approvals of the statutory bodies and technical details of the model offered. Successful Vendor shall submit following documents during Supply of material. a) Dimensional outlet with mounting details with model number, part list and technical literatures. b) Connection by purchaser (piping, Electrical etc.) c) Installation, Operation and Maintenance Instruction Manual. d) Testing and Inspection procedure. e) Original Calibration curve of each RPD meter f) Certificate from statutory bodies Certificate
9. Superior quality Flange nuts and bolts, required mounting accessories etc. are to be supplied

DATASHEET OF ELECTRONIC VOLUME CORRECTOR	
Subject	**Description**
Type	Microprocessor based, internal battery-operated Electronic Volume corrector with integral pressure transmitter and temperature sensor suitable for mounting in the field location. EVC may be separately mounted on yoke or inbuilt with RPD
Make & Model	To be specified by Vendor
Qty	One for each meter
Approval	Custody transfer approval
Function	To measure actual gas volume, pressure and temperature and calculates compressibility factors of the gas, Meter error and based on which calculates standard volume of gas. The unit shall be complete in all respects to achieve this functionality.
Installation	Suitable for Outdoor Installation, Tamper proof, water- weather proof and corrosion resistant for a life period of 20 years.
Ingress Protection	IP 65 or Higher
Safety Approval	ATEX
Hazardous area	Certified intrinsically safe for area classification Zone 1, Group IIA / II B, T3.
Working Temperature Range	5 Deg C to 55 Deg C (Ambient Temp.)
Inputs	LF / HF Pulse signal from meter and complying with EN12480
Output	One no. port for Connectivity to PC/Laptop for EVC configuration. Communication cable with adaptor for connecting the EVC with laptop
Calculations standard	i. Volume Flow calculations: AGA7 (Latest). ii. Compressibility: AGA 8 (Latest) - User selectable Detailed / Gross I / Gross II Methods (Default: Detailed).
Alarms	a) Battery Low b) Flow Over Range c) Fault-in Measurements
Displays	Alphanumeric large character LCD with selectable decimal, Displaying all units, messages, alarms etc shall be in English.The display can be configured by the user or retain the standardconfiguration as follows:a) Time & Date b) Uncorrected flow rate – m3/hr c) Corrected flow rate: Sm3/hr d) Corrected Totalised volume : Sm3 e) Uncorrected Totalized Volume : m3 f) Corrected Flow Yesterday: SCM g) Uncorrected flow Yesterday CM h) Corrected Flow Today: SCM i) Uncorrected flow today: CM j) Pressure : Kg/cm²g k) Temperature :°C l) PTZ Correction factor m) Battery Voltage) Alarms

Output Measurement	a) Un-corrected flow rate in actual cubic meter per hour (ACMH) b) Corrected flow rate c) Temperature d) Pressure e) Alarms output for unit malfunctioning f) Corrected Volume g) Correction factor h) Compressibility
Power supply	No separate power supply will be provided
Internal Battery Life	Internal Battery along with mounting hardware, if any Lithium (10 years minimum life) Battery pack should be intrinsically safe and replaceable in Field itself, without memory loss
Accuracy of the system	+ / - 0.5 (Vendor shall categorically indicate the system accuracy i.e. overall accuracy considering RPD meter, Pressure sensor & temperature sensor etc.)
Configuration Setup	To be done in factory for all EVC fully taking into account the process conditions, sensor & flow meter's characteristics and calibrations for direct on-site operations.
Features	a) Built in diagnostics to detect proper functioning.b) Data security through password/key-lock facility and volume conversion and configuration to be sealed.c) Parameters and programmed constants shall be stored in EEPROM / non-volatile memory.d) Facility for entry and accessing live and stored data through external Laptop/ PC.e) Shall have to store at least 120 days data (on Daily &hourly basis) for flowing pressure, temperature, uncorrected flow and corrected flow with date and time stamping.f) Storing of Audit trail and alarm summary.g) The stored data above shall be retrievable by using Laptops. Suitable port shall be available for Laptop's connection. Software required shall be supplied. All cables, software required for calibrating, configuring, retrieving the data to be supplied.h) Modbus facility for any third-party software with Modbus registers address changing facility
Mounting	EVC can be either inbuilt with RPD meter or mounted on meter. In case EVC is mounted on RPD meter, Vendor shall supply all necessary cables, SS tubing, manifold etc which all are required for integrating RPD meter with EVC along with suitable Mounting frame/arrangement.
Accessories to be supplied	1. In case EVC is mounted on RPD meter, Vendor shall supply all necessary cables, SS tubing, manifold etc which all are required for integrating RPD meter with EVC along with suitable Mounting frame/arrangement. 2. Software and its license for retrieving the stored data, Calibration and programming the EVC using portable PC (Laptop), remote software based on Windows 8(or latest) shall be supplied preferably in the form of Pen drive. 3. The Modbus communication protocol and message structure details to be used for SCADA shall be supplied. 4. Communication cable for communicating EVC with laptop (1 between a lot)

Documentation	Following drawings/documents shall be supplied:· EVC Configuration and calibration records· Catalog/product data sheet· Instruction, Operation & Maintenance manual in soft and hard copy.· Warranty certificate· Documentation including product literature, software/hardwaremanual, operating manual, maintenance instructions, Certificates etc. shall be supplied one each with all EVCs.·

Note:

1) For each EVC – Windows based Software (with media) of latest version - for retrieving the stored data, programming the volume corrector using Laptop shall be supplied with valid license.

2) Sets of Volume corrector documentation including product literature, software/hardware manual, operating manual, maintenance instructions, Certificates etc. shall be supplied.

3) EVC shall have Weights & Measures Type approval. If it is not available with the Vendor, Vendor has to submit an undertaking along with the bid that in the event of any purchase order placed on them, EVC will be supplied along with W&M approval.

4) Following features shall be available in volume corrector: -

1. Flash memory with non-volatile copy of program code.
2. Programmable peripheral chip with EEPROM contains boot ladder code.
3. SRAM with copy of program code and data/exact logs.
4. Flash memory preservation shall be achieved by 5-year data unpowered retention.
5. SRAM memory preservation shall be backed by Lithium Cell / Super capacitors.

5) Vendor/Supplier shall configure and update records in Volume Corrector as per technical requirement and data sheet before Final Inspection call. The process parameter and the required measuring units are already specified in Data sheets/ tender documents, and it shall be made available in Volume Corrector. All the specified function and features shall be demonstrated during the Final inspection.

6) The EVC shall transfer data to SCADA and shall be possible to read data from the SCADA (by wireless connection). SCADA, wireless connectivity and connection to the SCADA will be provided by Bidder's.

AMR/MODEM SPECIFICATIONS

- ATEX / PESO Ex Zone 1 Compliance
- Battery: 3 ~ 5 years (1 timestamp per day)
- Modems shall be powered by non-rechargeable batteries; the bidder shall ensure battery life of 3 to 5 years (in case of sending data one time daily). The life of battery shall be counted from the date of commissioning. The battery should be replaceable and encapsulated inside the unit causing to avoid tampering to disconnect power supply.
- Modem must be able to go under deep sleep mode for battery optimization.
- Serial interface for reading out of electronic volume correctors (EVC).
- External Enclosure Door Opening Alert & Modem Tampering alerts
- RS232 / RS485 interface and configurable with native EVC communication to get all the parameters of EVC not limited to few parameters. Data communication in native language means that the EVC data should be acquired using original EVC communication protocols such as iFlag, GazModem, DLMS, Elgas Protocols, etc.
- Modem must be designed such that Modem should be compatible with all Makes/Models of EVC given by CGD. Also, Bidder to ensure compatibility of Modem for future EVCs procured by the CGDs
- Communication Medium: 4G
- IoT Communication Protocol: MQTT / COAP
- Inbuilt Network diagnostics for ensure reliability
- Modem should be designed with connectivity logics keeping in mind the conditions of Indian congested & “Noisy” Areas to ensure 24 x 7 connectivity of the AMR System
- Reports: CSV, FTP, Email, HTTP, XML
- Ambient Operating Temperature – 0 Deg C to +75 Deg C
- Modem to have a display for configuration on-site
- External control button required with navigation to trigger manual transmission or operation selection.
- Highly accurate TCXO RTC to be used in the Modem for Time accuracy and reliability.
- RTC time synchronized storage in Modem, Must record data reading with actual timestamp for reliable and accurate meter data reading
- Modem must be able to remotely setup & configure EVC with compatible baud rates of EVC
- Heartbeat broadcast from Modem for Modem Health diagnostics like Network, Device Battery, Signal strength, etc.
- 4G Modem is to be safely housed in an IP55 all weather-proof, Hinge type Outer Panel enclosure with Screws, Screw Plugs for Panel Enclosure & Pipe for EVC cable protection
- Meter index readings need to be sent at server end every 24 hours. This data shall be provided to client on daily basis on portal designed by bidder also this data should be exportable in the form of excel/csv and shall be linked to SAP / CGD’s Billing Software as well.
- User Settable daily trial counts for establishing successful server communication with modem must be possible to ensure data reception of Modems in low network areas.
- Modems must have an adaptive facility to automatically stop remaining trials incase of data successfully received at server from device on any previous trials to save battery.
- Every available parameters data Backfill of 3 months (or as per EVC memory) must be possible through the modem to ensure automatic data reading and maximum data availability.

- Modem to have FOTA (Firmware Over-The-Air) update capabilities to remotely update the firmware for updates in future. Modem should have inbuilt Bluetooth / BLE / WiFi module to communicate nearby for FOTA at Site (This is required incase of low/no 4G network availability at sites)
- 4G Modem to have suitable IP rating as per standard of IEC 60529: Degrees of Protection Provided by Enclosures (IP code),
- Modem to be RoHS compliant
- Data security shall be ensured by bidder and data must be encrypted to global AES 128 standards.
- 4G IoT (M2M) SIM cards must be provided in-built in Modems
- Bidder shall co-ordinate with network service provider for configuration of SIMs. Client shall interact with supplier only which means client shall not co-ordinate directly with network service provider.
- Modems shall be capable of bi-directional communication; also they should have facility for remote configuration. The existing meter readings of all customers must be read into central server.
- The device shall be equipped with tamper deterrent seal, in case of any tampering with modem or EVC it should generate alarm and create alert on central server which should be visible on Web portal.
- Bidder shall ensure performance of modem in the temperature range of 0 deg.C to 50 deg.C and relative humidity of 100%. Modem must at least IP 55 protection or better for retrofits to be installed in industrial/commercial areas, also suitable for installation in hazardous area under classification ATEX Zone 1.
- When the device is turned ON, it should send uplink message containing OEM identifier, Model No., Firmware version, current configuration of the device.
- The modem should have an inbuilt logic to perform soft reset/auto reboot on its own in case of communication error.

SOFTWARE & SERVER SPECIFICATIONS

- The CGD plans to deploy a Meaningful, Customized, Human Centric Dashboard for Easy Data Monitoring, representation and reporting.
- Software shall display total volume as well as location, GA, State, and cluster wise volume of data
- The central server (hardware for the server i.e. PC, laptops, tough books etc.)/cloud server required for the proposed system will be in the scope of bidder. The required software etc. will be in the scope of Bidder.
- Software must be able to send data over OPC protocol
- Bidder shall provide the data accessibility for integration with other software like SAP, Billing Software, etc.
- The data transfer should be in such a format which is readily available for processing, access, read and uploaded in SAP or other systems. Data should be saved in compatible formats like csv/txt.
- AMR should have ability to send the data to server directly using Internet. If any application is required to be installed at server for accessing the data, it will be in the scope of bidder.

- Data should be provided in general data format for integration with General Service platform (GSP)/Business Analytics (BA), Dashboard as per Client requirement.
- Cloud server should comply with ISO 27001.
- Data security through password facility and hardware sealing.
- Parameters and programmed constants shall be stored in memory.
- Server should be capable to store Daily log and event logs for upto 5 years.
- System should be capable of integrating new customers in future.
- Integration of the AMR Server with other software for exchange various data base and generation of required reports.
- Any other IT related infrastructure change and modification required for successful deployment of the project.
- Firmware or software upgrade as and when required,
- Provide Alarms, Data Analytics, Exception Reports etc.,
- Provide a monthly report for all system performance parameters,
- Provide 99% average availability of Server. Bidder may be penalized for non-availability of server as per the penalty clause.
- Implementation of Configuration Change in the AMR, whenever Billing cycle frequency is modified/ amended.
- Minimum 98% readings with SLA based agreement shall be through automatic system
- Hourly, weekly, Monthly or customized reports as per Client requirement should be generated analysis purpose.
- Daily exception report should be submitted by the bidder.
- The software used should be capable of generating trends, alarms and graphics. Any updation /modification in reports/formats as per Client requirement should be done by the bidder.
- Integration of exhaustive analytics as desired by client – shall be configured by bidder. Bidder should provide the 4G network signal strength on portal (live screen)
- Network synchronization & diagnosis logs to be maintained in Dashboard for SLA
- The command buffering and execution response reports should appear on the dashboard during device wakeup time.
- The Remote EVC Configuration setup panel must be visible on the dashboard.
- To ensure cyber security, the web dashboard should be compliant with Vulnerability Assessment and Penetration Testing.
- Asset Management: AMR should be capable of supporting multi-layered collection network infrastructure consisting of device/meter, 4G network, Cable/Probe/EVC and metering related components.
- There should be facility to attach images / videos / PDFs consumer-wise for history track record of installation / maintenance proofs.
- The relationships between network topology structures and physical locations must be specified and displayed in the form of maps and topological graphs.
- AMR software shall have EVC communication driver inbuilt for data collection and same parameters of data display in prescribe format which define by CGDs.
- Grouping of meters/appliances on Building/Society/Street/Area wise basis for efficient customer management.
- Batch wise synchronizing of customer and meter/device change information and periodic logging works.

- Bidder will have to give technical/service operation.
- Information of device status, alarm information and service alerts should be synchronized.
- AMR self-diagnose of health of remote EVC based on collected parameters of data and generating alarms.
- Heat mapping of customers, devices / meters, customer types, price, etc. Service Data Analysis
- Volume-based heat mapping service data analysis of customers, appliances/meters, customer type, price, etc. and value-based flow analysis should be visible.
- The period-based requirement distribution analysis should appear.
- There should be essential supply forecasting analysis.
- Manual adjustment can be done to maintain the gas meter reading Manual adjustment is to be done through approval process certified by the designated authority in the web dashboard. Manual adjustment approval, log, approval status, timeline, requester and approver's IP address to be entered on the web dashboard.
- API call log, history and records are to be maintained in the web dashboard.
- Latest OAuth 2.0 API or better, integration protocols are to be used for 3rd Party Software / Billing Software / SAP integration. The SAP API has to have the facility to identify the type of record, i.e. manual or automated record.
- Information collection and services should be available to end users through the Internet.
- AMR Software shall have a comprehensive task/complain management facility for internal tracking with user assignment, dedicated task dashboard and analytics.
- Software shall have WhatsApp Integration for quick & on demand data analytics and for highly attentive data available hands-on for connectivity assurance, failure reports, etc.

Below key Modules / User Interface should be available in the offered Software

Sr. No.	Applicable Module	Contents
1	Dashboard	Google Map View: Devices are shown on Map with Active & Offline classification.
		Total Actual Consumption for Month (till date) in SCM
		Total Planned Consumption for Month
		Consumption Trend
		Actual vs Planned Consumption Trend
		No consumption detection details, Consumption Pattern report, Gas reconciliation through DRS.
2	Status Reporting	Battery Health in terms of Healthy, Low, Critical.
3	Report	Consumption Reports with selected date range in excel format - Consumer wise & Zone wise.

4	Device Management	Device Mapping to Consumer Property & History.
5	Consumer Management	Consumer Hierarchy & Zoning.
6	Bill Generation	Facility should be provided.
7	API Integration, SAP Integration Portal/App	Total Actual Consumption for Month (till date) in SCM as per client requirement.
8	Integration with other software systems	OPC protocol available
9	Alert Notification	SMS, WhatsApp & Email notification must be available
10	Network feasibility report	Network Analytics & Network Diagnostics

DATASHEET OF BALL VALVES (800#)		
Sr. No.	**Subject**	**Description**
1	Valve Manufacturer	Vendor to Specify
2	Valve Size (NB), mm (inch)	less than 2"
3	Design Standard	BS EN ISO 17292: 2004
4	Connecting Pipeline Design Pressure	19 Kg/cm2
5	Design Temperature, °C	0°C to +65°C
Valve Construction Design		
6	Configuration	Full Bore
7	End Connections	Socket Welding End
8	Ball Mounting	Floating Ball valves
9	Valve Operator	Lever operated
10	Valve type / Design	Ball Valve, 1 Piece Construction / Bolted 2 Piece Construction
Valve Material Specification		
11	Body	ASTM A 105
12	Ball	ASTM A 182 Gr. F6 / F 304
13	Stem	ASTM A 182 Gr. F6 / F 304
14	Stem Seals	PTFE
15	Stud Bolts/ Nuts	ASTM A 193 Gr. B7/ A194 Gr. 2H
16	Fire Resistant Design Requirement	API 607: 2005
Others Requirements		
17	Ball Position Indicator	Open / Close Indicator, Required
18	Mechanical Stops	For Open / Close Limits, Required
19	Stem Design	Anti-Blow Out Type
20	Anti-Static Design	Yes

DATASHEET OF BALL VALVES		
Sr. No.	**Subject**	**Description**
1	Valve Manufacturer	Vendor to Specify
2	Valve Size (NB), mm (inch)	1" and above
3	Design Standard	API 6D: 2008
4	Connecting Pipeline Design Pressure	19 Kg/cm2
5	Design Temperature, °C	0°C to +65°C
Valve Construction Design		
6	Configuration	Full Bore
7	End Connections	Flanged End
8	Flanges (wherever applicable)	Raised Flange
9	Ball Mounting	Floating Ball / Trunnion Mounted Trunnion mounted ball valves are applicable only if size of valve is 4"X300# and above
10	Valve Operator	Lever Operated
11	Valve type / Design	Ball Valve, 1 Piece Construction / Bolted 2 Piece Construction
Valve Material Specification		
12	Body	A 216 Gr. WCB
13	Ball	ASTM A 182 Gr. F6 / F304
14	Stem	ASTM A 182 Gr. F6 / F304
15	Stem Seals	PTFE
16	Stud Bolts/ Nuts	ASTM A 193 Gr. B7/ A194 Gr. 2H
17	Fire Resistant Design Requirement	Type test as per API 607 for Floating Ball Valve Type test as per API 6FA: 2008 for Trunnion Mounted Ball Valve
Others Requirements		
18	Ball Position Indicator	Open / Close Indicator, Required
19	Mechanical Stops	For Open / Close Limits, Required
20	Stem Design	Anti-Blow Out Type
21	Anti-Static Design	Yes

DATASHEET OF PG		
Sr. No.	**Subject**	**Description**
1	Make	Vendor to Specify
2	Type/Model	Vendor to Specify
3	Standard	BS EN 837
4	Type	Direct
5	Mounting	Local
6	Dial Size	100 mm / 150 mm
7	Window material	Shatter proof glass
8	Pressure Element	Bourdon tube
9	Element material	SS316
10	Socket material	SS36
11	Accuracy	±1% OF FSD
12	Color	White with black numerals.
11	Case Material	Die-cast Aluminium
12	Range	0 to 10 Bar (Inlet) and 0 to 4 Bar (Outlet) or other may be suitable

DATASHEET OF TG		
Sr. No.	**Subject**	**Description**
General		
1	Make	Vendor to Specify
2	Type	Filled System
3	Well	REQUIRED
4	Mounting	LOCAL
5	Flange Material	ASTM A 105
6	Flange(Rating / Face / Finish)	150# / RF / AARH
7	Dial Size	100 mm /150 mm
8	Colour	WHITE (Non rusting plastic with black figs.)
9	Window material	Shatter Proof Glass
10	Conn. Location	Bottom
11	Accuracy	±1% FSD
12	Enclosure	Whether Proof to to IS2147
13	Enclosure class	IP 67 / NEMA 4
14	Zero adj. Screw	Micrometer Pointer (Internal)
15	Case Material	DIE CAST ALUMINIUM (EPOXY PAINTED)
Filled System		
16	SAMA Class	V B
17	Compensation	Case
18	Bulb type	Adjustable Union
19	Bulb material	316SS
20	Bulb union threaded to	½” NPT(M)
21	Extension type	RIGID
22	Bulb dia	8 mm (Min)
23	Over range protection	130% of Range
Thermowell		
24	Material	SS 316
25	Construction	Drilled Bar Stock
26	Process connection	1 ½” FLANGED
27	Gauge connection	½” NPT (F)
28	Options	1. Liquid Filled

DATASHEET OF FILTER		
Sr. No.	**Subject**	**Description**
1	Make	Vendor to Specify
2	Type/Model	Vendor to Specify
3	Filter	Cartridge
4	Type	Horizontal / Vertical
5	Design Temperature, °C	0°C to +65°C
6	Particle / Mesh Size	5 Micron
7	Maximum Working Pressure	6 Bar
8	Design Pressure	19 Bar
9	Efficiency	99%
10	Design Code :	ASME SEC-VIII DIV-1 (LATEST EDITION)/ According to 2014/68/EU Directive, EN13445 standard.

Pipe Works and Fittings		
1	Pipe work	API 5L OR ASTM A 106 Gr. B
2	Fittings	ASTM A 234 GR WPB, ASTM A105
Painting		
1	Specifications	BS 4800 CANARY YELLOW FINISH
Noise Level		
1	Specifications	<= 85 dBA @1 Metre length

DATASHEET OF NRV		
Sr. No.	**Subject**	**Description**
1	Make	Vendor to Specify
2	Type/Model	Vendor to Specify
3	Design Pressure	19 bar-g
4	Governing Standard (**Guideline: PNGRB T4S Standard)**	API-6D
5	End Connection / Flange Facing	Flanged End (As per ASME B 16.5) RF-125 AARH (ASME B 16.5)
6	Fire safe design	Vendor to Specify.
7	Body	
8	Cover	
9	Disc/Plates	
10	Body Seat ring	
11	Disc Hinge	
12	Hinge pin	
13	Stud Bolts & Nuts	
14	Gasket	
15	Spring	
16	Shut off Class	IV

DATA SHEET – CRV		
1	Tag No	CRV
2	Type Of CRV	Direct Acting Spring Diaphragm type
3	Process Con. / Rating	150#
4	Service	OVER PRESSURE RELIEF- Natural Gas Service
5	Standard	As per Back Pressure Relief Valve
6	Model No.	*
7	Fluid / State	Natural Gas (G)
8	Inlet Pr.(Min/Opr/Max)	**
9	Outlet Pr.(Min/Opr/Max)	**
10	Temp. (Min/Opr/Max)	**
11	DP Sizing	*
12	Set Pressure	*
13	Set Pressure Range	*
14	Design Factor	*
15	Max. Capacity	Designed for 1% of skid flow
16	Predicted Noise dBA at 1 M	85
17	Impulse Connection	*
18	Impulse Size	*
19	Leakage Class	ANSI CLASS VI
20	IBR Certification	NO
21	Body	*
22	Plug	*
23	Diaphragm	Nitrile/ Synthetic rubber Any compatible to service
24	Actuator / Spring Casing	*
25	Spring	*
26	Set Screw	*
Note:		
1.'**' As Per P & Id, '*' Vendor Shall Furnish a Schematic Indicating all the Impulse Line Connections, Locations, Min. Distant and Sizes to the CRV.		
2. Vendor Shall Furnish the Sizing Calculations along with offer		

DATA SHEET - SLAM SHUT DOWN VALVE (VALVES INTEGRAL WITH PRESSURE CONTROL)		
UNITS: Flow > Liquid - m*3/hr, Gas-SCMH, Steam - kg/hr. Pressure -> kg/cm 2(g), Temperature-°C, Level/ Length-> mm		
1	Line Size/Schedule	*/*
2	Service	Natural Gas
3	Type of Valve-Actuator	Pilot
4	Standard	EN 14382 (SSV) and EN334 for PCV
5	Failure Position	Fail to Close Type
6	Design Class	150#
7	End Conn: Flgd. Size & Rating	FLANGED ENDS ANSI 150 #, (rating same as upstream pipe), RF 125 AARH
8	Body & Cover Material	ASTM A 216 Gr. WCB Charpy test at 0 degree or suitable any other material for withstanding the pressure requirement and Compatible to Natural gas service
9	Seat /Disc Material	SS 316 or Any compatible to service and withstanding the pressure requirement
10	Impulse Connection	Vendor to Specify
11	Accuracy	As per EN 14382
12	Other Wetted Parts	SS 316 or Any compatible to service and withstanding the pressure requirement
13	ANSI Leakage Class	ANSI -CLASS VI / EN14382
14	Failure Position for Regulator	Fail to Open
15	Manual Reset	Required
16	Position Indicator	Required
17	Closing Time	Less than 2 Sec / As per BS EN 14382 Or better
18	Provision for Limit Switch	Required (One each for Open/Close Position)
19	Fluid / State	Natural Gas / Vapour
20	Flow Liquid_Min	**
21	Flow Vapour_Min	**
22	Inlet Pr._Min	**
23	Outlet Pr._Min	**
24	Delta Pr. Shut Off	*
25	Temp. ° C Oper.	**
26	Maximum Flow Capacity	**
27	PCV Set Point	*
28	Predicted Sound Level DBA	As per PNGRB guideline
29	Inlet Velocity M/S	As per PNGRB guideline
Note:		
1.**' As Per P& Id and * - To Be Furnished by the Vendor		
2. Spring Shall Be Suitable to Adjust Outlet Pressure Range of Skid Indicated in the P&ID. And Overpressure Spring Range to Be Decided During Detail Engg.		
3. Vendor Shall Furnish a Schematic.		
4. Vendor Shall Furnish the Sizing Calculations along with offer		
5. Vendor Shall Furnish Spring Ranges		
6. The Selected Size & Model Shall Be Such That the Valve Must Operate and Control Pressure at Both Min. And max. Flow Rate As Indicated With the Given Pressure Conditions.		

DATA SHEET – PRESSURE REGULATOR		
UNITS: Flow > Liquid - m*3/hr, Gas-SCMH, Steam - kg/hr. Pressure -> kg/cm 2(g), Temperature-°C, Level/ Length-> mm		
1	Line Size/Schedule	*/*
2	Service	Natural Gas / Vapour
3	End connection	*
4	Body & Cover Material	As per EN334
5	Internals	As per EN334
6	Material of Diaphragm	Nitrile or Synthetic Rubber or Any compatible to service and withstanding the pressure requirement
7	Regulator	EN 334: 2005
8	REGULATION ACCURACY	+/- 5% OF SET OUTLET PRESSURE (G) OR BETTER
9	COMPONENTS FOR GAS SUPPLY	SS 316/DIN 30690 PART-1 / DIN 30690 PART-2 (LATEST) OR EQUIVALENT
10	Impulse Connection and Size	*
11	Spring Range	*
12	LEAKAGE CLASS	AS PER EN 334
13	Provision-Limit Switches	NOT REQUIRED
14	Provision for Limit Switch	NOT REQUIRED
15	Manual Reset	Yes, Required
16	Failure Position	Fail to Open
17	Position Indicator	*
18	Closing Time	LESS THAN 2 SEC
19	Fluid & State	DRY NATURAL GAS
20	Temperature o C -Working/Design	** / **
21	Inlet Pressure: MIN / NORMAL / MAX	** / **
22	FLOW: MIN / NORMAL / MAXIMUM	** / **
23	Design Pressure	150 Class
24	Predicted Sound Level DBA	As per PNGRB guideline
25	Inlet Velocity M/S	As per PNGRB guideline
Note:		
1.**' As Per P&ID and * - To Be Furnished By the Vendor Shall Furnish A Schematic Indicating All The Impulse Line Connections, Locations, Min. Distant And Sizes To The Main Valve And To The Slam Shut Valves		
2. Vendor Shall Furnish the Sizing Calculations along with offer		
3. PCV Shall Be as Per EN 334/ Eqvt. Std		
4. Spring Shall Be Suitable to Adjust Outlet Pressure Range of Skid Indicated in the P&ID. Set Point - By Vendor.		

VENDOR LIST

PRESSURE REGULATOR AND SLAM SHUT VALVE

1. M/s Emerson Process Management (Fisher / Tartarini)
2. M/s RMG-Regel Messtechnik / Bryan Donkin (Germany)
3. M/s Nirmal Industrial Controls (India)
4. M/s Gorter Controls (Netherlands)
5. M/s Dresser
6. M/s Gastech Natural Gas Equipment

RPD METER

1. M/s Itron (Formerly, Actaris / Schlumberger).
2. M/s Elster-Instromet.
3. M/s Smithmeter.
4. M/s Dresser
5. M/s Romet, Canada
6. M/s MetreG

VOLUME CORRECTOR

1. M/s RMG Messtechnik Gmbh, Germany
2. M/s Elster (Honeywell)
3. M/s Daniel Flow Products inc.,USA
4. M/s Dresser, (Rockwin Flow Meter,India)
5. M/s Itron (Formerly, Actaris / Schlumberger).
6. M/s Barton Instruments, UK
7. M/s Romet,Canada.

PRESSURE GAUGES, D. P. GAUGES & TEMPERATURES GAUGES

1. M/s AN Instruments Pvt. Ltd.
2. M/s General Instruments Ltd.
3. M/s WIKA
4. M/s Forbes Marshall
5. M/s Hirelkar
6. M/s Baumer
7. M/s Mass

JUNCTION BOXES AND CABLES GLANDS

1. M/s Ex-Protecta
2. M/s Flameproof Control Gears
3. M/s Baliga
4. M/s Flexpro Electrical

SS VALVES, SS TUBE & SS TUBE FITTINGS

1. M/s Parker (USA)/ M/s Swagelok (USA)/ M/s Hoke/ M/s SSP –SS fittings
2. M/s Sandvik, Sweden, M/s Tubacex –SS tubes
3. M/s Parker, M/s Swagelok –SS valves
4. M/s Arya – SS Fittings

BALL VALVE

1. M/s Hopkinsons Limited (UK)
2. M/s O.M.S. Saleri (Italy)
3. M/s Pibi Viesse SPA (Italy)
4. M/s Nuovo Pignone (Italy)
5. M/s Perar SPA (Italy)
6. M/s Larsen & Toubro Ltd. (Audco India Limited, Chennai)
7. M/s Microfinish Valves Ltd. (Hubli)
8. M/s Raimondi Valve S.P.A. (Italy)
9. M/s Virgo Engineers (Pune)
10. M/s Petro valves
11. M/s Tormene Gas Technology S.P.A. Valvetalia Group, Italy
12. M/s Hawa
13. M/s S.S.Engineering Works
14. M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)

GLOBE VALVE

1. M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)
2. M/s Datre Corporation (Kolkota)
3. M/s L & T, New Delhi
4. M/s Neco Schubert & Salzer Ltd. (New Delhi)
5. M/s Niton valve (Mumbai)
6. M/s Ornate valves (Mumbai)
7. M/s Panchvati valves (Mumbai)
8. M/s Hawa
9. M/s Petro valves
10. M/s S.S.Engineering Works

CHECK VALVES

1. M/s Malbranque (France)
2. M/s Mannesmann Demag (Germany)
3. M/s Petrol Valve (Italy)
4. M/s True Flow Rona (Belgium)
5. M/s. Expert
6. M/s BDK Engineering India Ltd. Hubli, Karnataka / M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)
7. M/s Neco Schubert & Salzer Ltd. New Delhi
8. M/s BHEL, OFE & OE Group New Delhi
9. M/s Precision Engg. Co., Mumbai
10. M/s Leader Valves Ltd., Jalandhar
11. M/s Niton Valves Industries (P) Ltd., Mumbai
12. M/s Larsen & Toubro Ltd. (Audco India Limited, Chennai)
13. M/s Aksons & Mechanical Enterprises, Mumbai
14. M/s Petro Valves
15. M/s Datre Corporation Ltd., Calcutta
16. M/s Advance Valves Pvt. Ltd., Noida
17. M/s S.S.Engineering Works
18. M/s AV Valves Ltd., Agra

1) M/s Hawa

Notes:

1) For items listed above, the successful bidders shall supply from the approved makes only.
2) For any other item(s) for which the vendor list is not provided, bidders can supply those item(s) from reputed vendors/ suppliers who have earlier supplied same item(s) for the intended services in earlier projects in GASONET and the item(s) offered is in their regular manufacturing/ supply range is acceptable.

GROUP-B

TECHNICAL SPECIFICATION OF COMMERCIAL SMART METERS

The scope of work shall cover design, engineering, manufacturing, testing, inspection, preparation for shipment and transportation of the Gas Meters, EVC AMR, Data hosting and associated services for 5 years from the date of Delivery of the meters, as per technical requirements/specification for City Gas Distribution.

The functional requirements of Gas Meters shall be in line with the following points:

1. Meter reading counters and housing assembly should tamper proof should be break open type and attempt to tamper with the counters/housing assembly should lead to stoppage of gas flow through the meter or break open the meter body.
2. Meter reading counters should be non-reversible type.
3. Instead of external housing, the metering display housing should be integral part of the Meter.
4. Gas Meters should be SMART METERs having Automatic Meter Reading (AMR) facility based on GSM/GPRS technology and reading data should be accessible on Cloud with secure login credentials.
5. Gas Meters should be designed to display the corrected reading in SCM (Standard Cubic Meters) or should be equipped with the required provisions for the same.

CODES & STANDARDS

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 the following standards.

Description	Standard
Gas Meters	**OIML R137, EN 1359 +A1 or equivalent ISO 14511**
Degree of Protection Provided by Enclosures (IP Code)	**IEC 60529**
Pipe Flanges and Flanged Fittings	**ASME B16.5 Edition 2013**
Pipe Threads, General Purpose (Inch)	**ASME B1.20.1**
Electronic Volume Corrector	**EN12405-1 + A1**

REQUIREMENTS APPLICABLE TO ALL FLOW METERS

- Availability of importing license for flow meters (applicable if imported)
- Model approval certificate from Legal Metrology, Govt. of India.
- Type approval/compliance/examination certificate which conforms to the governing standard.
- Weights & Measures, EN and ATEX marking (engraved/tamperproof) on the flow meters.
- ATEX & PESO certification.
- IP Certificate.

Offered Gas flow meters shall be certified for custody transfer (Weight & Measurement) of natural gas complying to relevant standards and codes by internationally recognized certification agencies. All meters shall compulsorily comply with the requirements of Petroleum and Natural Gas Regulatory Board (Technical Standards and Specifications including Safety Standards for City or Local Natural Gas Distribution Networks) Regulations, 2008+ Amendment notification dated 15th September 2020. In case of dispute between PNGRB standard and other codes, PNGRB standard shall prevail.

1. DATA SHEET FOR SMART GAS METERS

Sr. No.	Meter Type	Min / Max. Flow (At Actual Conditions)	Centre to Centre Distance	Design Pressure	Pressure Drop
1	G-4	Min. Flow: 0.04 SCMH Max. Flow: 6 SCMH	Vendor to Specify	500 mbar	Less than 2 mbar
2	G-6	Min. Flow: 0.06 SCMH Max. Flow: 10 SCMH	Vendor to Specify	500 mbar	Less than 2 mbar
3	G-10	Min. Flow: 0.10 SCMH Max. Flow: 16 SCMH	Vendor to Specify	500 mbar	Less than 2 mbar
4	G-16	Min. Flow: 0.16 SCMH Max. Flow: 25 SCMH	Vendor to Specify	500 mbar	Less than 2 mbar
5	G-25	Min. Flow: 0.25 SCMH Max. Flow: 40 SCMH	Vendor to Specify	500 mbar	Less than 2 mbar

Feature	Specification
Meter Type	Vendor to Specify
Service	Natural Gas
Governing Standard	Diaphragm Meter: EN 1359:1999 + A1 Amendment 2006 or latest Thermal Meter: OIML R137-2 & ISO 14511RPD Meter: EN12480 and EVC: EN12405
Approval Type	Type approval certificate as per Governing Standard
Accuracy	±3% (Qmin to 0.1 Qmax) ±1.5% (0.1 Qmax to Qmax)
Accuracy Class	1.5
Installation	Suitable for outdoor/indoor installations, tamper-proof and corrosion resistance for a life period of 10 years.
Index	8-Digit mechanical indexes – Units in m^3. Index shall be provided with sealing arrangement to avoid tampering.
Back-run Alarm	Meter Should Generate Alarm on Web-Application in case of tampering or back flow condition.

Transmission Rate	Vendor to Specify
Transmission System	Tamper-proof non-magnetic
Environment Protection	Mechanical Environment M2 & Electronic Environment E2
Operating Temperature	-10° to 55°C
Body Casing	Steel with suitable coating on inside and outside for corrosion protection of casing.
Color	Vendor to Specify
Ingress Protection	IP65 or better
End Connections	G4: 3/4" and G6 to G25: 1" NPT (Threaded) Inlet and Outlet Connection. (In case the end connections are differing, bidder to provide suitable adapters of Brass to meet the specified end connections).
Other Internal Parts	All meter internals shall be non-metallic to prevent from tampering like magnet.
Automatic Meter Reading (AMR)	The meters quoted should be supplied with inbuilt AMR solution and GPRS module with SIM cards for uploading the meter data into cloud server. SIM cards for GPRS module shall be supplied by the Bidder's.
Volume Correction	Volume correction is required and should be automatically calculated by the meter and uploaded by the AMR to the server.
Additional Points	• Meter shall be provided with AMR, and reading shall be in standard cubic meter (SCM) at standard base temperature of 15°C & base pressure of 1.01325 bar. • BIDDER to ensure the type of approval for meter with Model & Make certified from Weights & Measures shall be provided.

FUNCTIONAL REQUIREMENT FOR AMR

Commercial Gas Meters shall be provided with GSM / GPRS based AMR solutions. The meters shall be installed in strategic locations as designated by GASONET be supplied with GPRS modem and SIM cards to record Gas consumption and diagnostics from the meters. The meter reading data collected through AMR system shall be uploaded to BIDDER's cloud server. The cloud server should store the meter reading historical data for a period of 6 months. The cloud server shall provide secured and encrypted platforms for Owner through web services using https protocols. The AMR should have replaceable batteries for power supply, and the same must be in ex-proof enclosure certified by PESO. The Lithium batteries must have a self-life of a minimum of 5 years; from the date of installation/commissioning whichever is later.

INSPECTION

- Inspection shall be carried out as per the approved Quality Assurance Plan and GASONET Technical Specification.

- Supplier shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports as per GASONET Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.
- The supplier shall hire Third Party Inspection Agency (to be approved by the Client) to perform inspection work. This agency shall inspect all the equipment/material and issue all inspection certificates/reports as per specifications and codes.
- Even after third party inspection, GASONET reserves the right to select a sample randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in GASONET Technical specification, then GASONET reserves the right to reject all production supplied from the batch.

PACKING & SHIPMENT

Supplier / Vendor shall provide a detailed packing list for all the items been supplied. Necessary accessories supplied shall be packed in the main package box for which accessories are been supplied. 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 client site / location / workshop concerned.

OTHERS

- The end connection of the meters shall be protected with plastic caps. In the case of Flange ends, companion flanges with Bolts shall be provided at each end. In case the end connections of the meters proposed by the bidder are not in line with the end connections mentioned in the data sheets, the Bidder shall supply suitable adaptors to suit the desired end connections. Companion flanges with Bolts if supplied shall be enclosed within the Meter packing box.
- All accessories along with a meter shall be supplied in a single package along with the meter along with the packing list on each package. In every package a copy of the calibration certificate shall be enclosed.
- Supplier shall mention the model no. that is being offered along with the catalogue in English along with the bid.

DOCUMENTS TO BE SUBMITTED AT THE TIME OF BIDDING

The bidder shall submit the following documents

- Detailed technical catalogue in English from the manufacturer of the Item shall be provided along with offer.
- Weights & measures type approval certificate.
- Type approval/compliance/examination certificate which conforms to the governing standard.
- Deviations from technical specification, if any, with proper justification.
- Supplies against major orders for Natural gas application (PTR).

DATA HOSTING AND SERVICES AGREEMENT FOR 5 YEARS

This document defines the minimum scope for Commercial and Industrial meter reading data hosting in VENDOR's cloud server and associated services for 5 years. The document specifies the terms and conditions which VENDOR shall adhere to during the entire tenure of contract.

BRIEF SCOPE OF SUPPLY/SERVICES

The following are the minimum scope and responsibilities of the VENDOR in terms of data hosting and the services required by GASONET.

- Grid independent battery packs for powering EVC/Sensor/Modem.
- Data transmission by GSM/GPRS.
- Communication should be one way (SIMPLEX).
- Data transmission cost includes SIM card and monthly charges.
- Hardware for server. Server should be OPC compliant. Cloud server is accepted.
- BIDDER shall commission the gas meters within 7 business days after GASONET's intimation of completion of meter installation. Commissioning costs be included in the meter supply cost, data hosting cost, no separate cost is envisaged for commissioning & and data hosting. Installation of the gas meters is in GASONET's scope.
- Configuration of ASSET ID for each meter after commissioning (ASSET ID shall be provided by GASONET).
- BIDDER shall establish and demonstrate the signal communication between gas meters and BIDDER's cloud server to GASONET/TPI.
- On billing days, i.e., 1st and 16th of every month, BIDDER must ensure 100% availability of meter reading.
- Maintain hourly logs of gas consumption of each meter i.e., 24 logs per day for each meter, upload them to GASONET dashboard once a day and store historical data for at least 6 months on BIDDER's cloud server.
- BIDDER to provide data analytics access through dash boards to GASONET personnel via secured and encrypted platforms through web services using https protocols.
- **BIDDER to provide real time alarms to GASONET in case of any malfunction/tampering to GASONET. The alarm SMS shall be sent to 3 GASONET designated phone number and simultaneously email to 3 designated email IDs.**
- Update any firmware or software required for proper functioning of the complete system is in BIDDER's scope.
- BIDDER to provide system should have facility to send mail or SMS to end customers for billing purpose or notification.
- Attend GASONET's demands regarding report abnormality or absence and provide justification / rectification against any mismatch or issue raised within prescribed time frame as decided by GASONET.
- In case of failure of automatic reading collection, reading should be collected manually and submitted to GASONET on 1st and 16th of every month.

AMR REQUIRMENTS (IF NOT INBUILT WITH THE EVC)

- BIDDER should submit the details of hardware such as Make, Model, Approval certificates and catalogues of all the hardware along with the unpriced bid for technical evaluation.

- AMR system shall be compliant for Zone-1
- PESO/CCoE Nagpur certification shall be provided.
- Equipment type approval from concerned authorities like wireless Planning & Co-ordination wing WPC/WEEE/ROHS shall be provided.
- Area classification as per IEC-79, Zone 1, Group IIA/B, T3/T4.
- Site condition: Temperature 0°C to 65°C (Design), Hot humid, Tropical saline environment.
- Enclosure: IP65 or better.
- Necessary mounting supports shall be supplied by the Vendor.

DETAILED SCOPE OF SERVICES

- The following are the detailed scope of services to be provided by the BIDDER. Failing to meet these services requirement, BIDDER shall be liable to pay penalties as per the clauses specified in the agreement.
- **COMMISSIONING:** BIDDER shall commission the meters within 7 business days calendar days post installation of the asset by GASONET. BIDDER shall be responsible for providing geo-tagging for the meters installed in the format provided by GASONET. BIDDER shall provide a report of the geo-tagged assets within 7 business days from the time of installation. BIDDER shall verify and demonstrate the signal communication between gas meters and the BIDDER's cloud server to GASONET/TPI. BIDDER shall also demonstrate the alarms features considered for the situation as mentioned in List of Alarms.
- **RECOMMISSIONING:** There may be some cases where GASONET needs to relocate the gas meters. In such cases BIDDER re-commission, the meter and update the software/hardware in the system to put the meter in line for gas consumption reading without any cost implications to GASONET.
- **DATA HOSTING:** Gas consumption reading and other diagnostic/monitoring data shall be uploaded from AMR system though GPRS to BIDDER's cloud server in real time. BIDDER shall host the meter reading data on the BIDDER's cloud server. BIDDER to maintain the record of historical data for at least 6 months.
- **READING:** BIDDER to upload the meter reading data every day at 6am to GASONET's dashboard. BIDDER will be penalized in case they fail to upload the reading data complete in all respects and on schedule as per penalty clause mentioned in the clause of PENALTY.
- **REPORT**: BIDDER shall provide a facility of viewing and extracting reports according to requirement and in the format desired by GASONET through dash boards. BIDDER to support GASONET to resolve any issues related in viewing and extracting report and modification of report layout in future as required by GASONET without any cost implication.
- **ADDITION/DELETION**: The system supplied by BIDDER shall be suitable to add or delete consumers as and when required by GASONET. The changes required for addition/deletion in the software/system shall be made by BIDDER. The modification is to be done seamlessly without disturbing the dashboard of GASONET.
- **CLOUD SERVER**: The meter reading data shall be collected automatically through GPRS module with SIM card installed with each meter supplied by the BIDDER and the reading data shall be hosted in BIDDER's cloud server. BIDDER's server shall be subjected to audit conditions as prevailed in ISO 27001. BIDDER shall hire a third party and shall conduct a cloud server audit once in each financial year. Intimation of audit shall be conveyed to GASONET to witness the audit. A

random audit shall be conducted by GASONET once in each financial year; GASONET shall provide intimation of such a random audit to BIDDER in advance. 15 days prior notice will be given to Bidder for this.

- **AMR DATA AVAILABILITY:** Scan time of necessary values for AMR should be 1 hour or better. Data should be transmitted to a centralized server on once a 24-hour basis. Data transmission between AMR and remote server shall be encrypted to prevent intruder access. Overall data security shall be ensured by BIDDER through suitable encryption to prevent intruder access. Number of user ID and password for logging on to server shall be as desired by GASONET.
- **AMR DATA STORAGE FACILITY**: Data security through password and hardware sealing. Parameters and programmed constants shall be stored in memory.
- The stored data should be retrievable by using a laptop/centralized system. The system should be capable of store hourly log, daily log and event logs for one year.
- **SOFTWARE/FIRMWARE:** BIDDER shall be responsible for upgrading any software/firmware as and when required for optimum performance of the services without any cost to GASONET. BIDDER shall get approval from GASONET before performing such an activity. Any interface issue arising due to such activity shall be under scope of Vendor. The software upgrade shall be seamless and shall not hinder the billing process. System shall be restored within 24 hrs of software or firmware upgrade.
- **CODE OF CONDUCT:** Good conduct shall be maintained by BIDDER's personnel while having any interface with CUSTOMER/OWNER. BIDDER personnel shall always carry OWNER's provided Identification Card, and any Government of India issued ID card (e.g. Adhaar etc.) in support. GASONET shall not be liable for any misconduct or mal practices adventured by BIDDER's personnel during any operation.

DATA ANALYTICS

BIDDER shall provide the following features of data analytics to OWNER through dashboards.

Number of Concurrent Users of Dashboards	10 or more
Data Analytics on Management Dashboard	• Hourly consumption. • Daily report. • Fortnightly report. • Monthly report. • The same report shall be generated as consolidated reports for all customers.
Data Analytics on Marketing Dashboard	• Hourly consumption. • Daily report. • Fortnightly report. • Monthly report. • The same report shall be generated as consolidated reports for all customers.
Parameters required	The following data are required from all meters: • Corrected volume • Yesterday's corrected volume (6:00AM to 6:00AM) • Total corrected volume • Time/Date

Data Analytics on Operation Dashboard	• Hourly consumption. • Daily report. • Fortnightly report. • Monthly report. • The same report shall be generated as consolidated reports for all customers.
Reports	• Hourly, weekly, monthly reports as per GASONET requirement. • Zero consumption report on a daily basis. • The software should be capable of generating trends, alarms and graphics.
List of Alarms	• Any tampering of the gas meters. • Reverse or back flow • Communication • Low battery

PENALITIES:

If BIDDER fails to meet any of the following requirements, GASONET may levy the following penalties on the contractor and deduct penalty amount during release of outstanding CPBG annually.

- INR 500/- per meter per day in case of delay in commissioning within 5 days of installation intimation by GASONET.
- INR 1000/- penalty per event of server downgraded performance of 12 hrs in a 30-day cycle.
- The BIDDER must make 100% reading available on GASONET billing days i.e., 1st and 16th of every month. Out of 100% readings, at least 95% readings shall be available through AMR in every GASONET billing cycle. In case it is found that the performance level is below the committed levels for every 1% drop in SLAs, then a penalty of INR 500/- shall be levied.
- In case if meter readings are not available an hourly basis through AMR in GASONET dashboard. In this case, BIDDER can submit manual readings for a maximum of two GASONET billing cycles to customers. If manual readings are submitted for more than two consecutive cycles for customers, then a penalty of INR 500/- per case per day shall be levied.
- In case it is found that wrong readings / data are hosted by the Vendor (due to non-working / malfunctioning of AMR system) then GASONET is liable to recover any loss of revenue from the Vendor.
- The Vendor must provide 24 logs / day for each meter and upload to GASONET dash- board once in a day for any customer. In case the Vendor is unable to upload the data once a day then a penalty of INR 500/- per meter per day shall be levied.
- In case of failure to provide real time alarm through SMS and Email consecutively for two instances, a penalty of INR 1000/- shall be levied.
- If any authorized representative / employee of BIDDER is involved in connivance with the consumers / indulged in mal-practice like deliberately forwarded wrong meter reading or is found to be manipulating the reading of customers or is tampering the software or in PNG meter or any GASONET installation, bypassing of meter etc., penalty of INR 10,000/- will be levied for each such case along with the criminal case shall be lodged against the Vendor or its representative. The above penalty is over and above the losses to GASONET, which is to be recovered from the concern Vendor and legal action will be taken.

TRAINING

The BIDDER shall be required to hold training sessions at site as well as at GASONET head office for approx. 10 personnel initially and thereafter every year during the contract period to facilitate the operation and to provide hands-hand-on to the dealing staff. staffing shall include installation, programming, trouble shooting and analysis of data. The BIDDER shall provide requisite information and hard copies of manuals for reference.

MANPOWER

All manpower including engineers, technicians etc., associated with the project shall be required to wear protective gears such as safety shoes, helmets, goggles etc. All manpower deputed at site for installation and commissioning of equipment's shall be covered under statutory government compliances of PF, ESI, accident insurance, death, disability etc.

The bidder shall submit an organogram to the project team that shall be providing support services for Installation and Commissioning. After successful commissioning, the project bidder shall provide a dedicated team of one engineer in shift for operation and maintenance & Monitoring of the AMR system in GASONET. Engineers deployed should be graduate engineers/diploma engineers in electrical/electronic /instrumentation field with minimum experience of 2 years for graduate engineers and 6 years for diploma engineers on similar system.

LANGUAGE & APPLICABLE LAW

The agreement shall be written in English language unless specified otherwise in the SCC. All correspondence and other documents pertaining to the Agreement which are exchanged by the parties shall be written in the same language. In case, any document/brochure etc. is written in any other language then its English translation shall govern. The CONTRACT shall be governed and interpreted in accordance with laws of India and Courts at Pune shall have exclusive jurisdiction.

GROUP-C

TECHNICAL SPECIFICATION OF DISTRICT REGULATING SKID (DRS)

SCOPE OF SUPPLY (SOS)

This document covers the supply of the District Regulating Station to be used in City Gas Distribution Project.

Sr. No.	Description	Qty (In Nos.)
1.	Design, Engineering, Manufacturing, Testing, Nameplate marking, Painting, Inspection, Packaging, Forwarding, Transportation, Transit Insurances, Shipment, handling, Unloading of skid at GASONET store / Site, Calibration and Supply of RPD Meter based DRS of 2500 SCMH which comprise of (1W+1S) Filtration, (1W+1S) pressure reduction (active-monitor configuration), RPD meter, field mounted Flow Computer, Gas Detector, data logger with 5 year web hosting in Configuration, Interfacing, Integrated Testing & Commissioning as per Job specifications and Special Instructions enclosed.	**01**
2.	Design, Engineering, Manufacturing, Testing, Nameplate marking, Painting, Inspection, Packaging, Forwarding, Transportation, Transit Insurances, Shipment, handling, Unloading of skid at GASONET store / Site, Calibration and Supply of RPD Meter based DRS of 5000 SCMH which comprise of (1W+1S) Filtration, (1W+1S) pressure reduction (active-monitor configuration), RPD meter, field mounted Flow Computer, Gas Detector, data logger with 5 year web hosting in Configuration, Interfacing, Integrated Testing & Commissioning as per Job specifications and Special Instructions enclosed.	**01**

The scope of work/ supply includes Design, Engineering, Manufacturing, Inspection, Testing and Supervision for Installation & commissioning of Metering Skid consisting of Filtration, Pressure Reduction system, flow measurement (through RPD Meter) including with RPD (Inbuilt) or field mounted EVC, along with all the accessories and valves, piping, instruments & fittings as per P&ID's.

The Required capacity, Pressure Rating, Quantity and Location of the Skids shall be as per P & ID's attached with this document.

Description of DRS as below:

Category	Flow Rate (SCMH)	Inlet Pressure (Kg/cm2g)	Outlet Pressure (Kg/cm2g)	Type of Flow Meter	Qty.
DRS - I	2500	16 to 28	4 to 6	RPD Meter G400	01
DRS - II	5000	16 to 28	4 to 6	RPD Meter G400 to G100	01

Sizing calculations and pressure drop calculations for inlet and outlet pipeline, filtration system, slam shut valves, pressure control valve, Flow meters and Pressure relief valves. Calculation for Gas velocities and Pressure drop across slam shut valves, and meter runs at maximum flow and minimum pressure to be submitted. The entire system (including all the components, equipment's, Instruments) shall be selected and offered in such a way that the overall pressure drops across the entire skid shall be minimum. Detailed sizing calculation for individual components and pressure drop for entire skid (including diff. Pressure across individual components of skid to be provided.

Note: **The successful bidder will be required to supply the DRS in the quantity as mentioned in the above table or as per Annual Rate Contract order (ARC order) in case of splitting of quantities during the contract period. However, the quantities are indicative and may be interchanged in more or less proportion depending upon requirement and as per the instruction of GASONET within the overall limit of the contract value at same rate, terms and conditions.**

The velocity of the gas up to upstream of the filter would be 20 M/s and downstream of filter will be 40 m/s when the maximum flow rate occurs at the lowest expected inlet pressure as per T4S standard.

REMARKS

- **Supplier's Scope**
  Supplier's scope of work includes the equipment with all internals & accessories shown on the data sheets, specifications and all the parts necessary for satisfactory operation & testing except those which are indicated to be out of Supplier's supply.

- **Inspection**
  Supplier shall submit with his bid a list of 3 well known international Third-Party inspection Agencies for owner approval, which he intends to use for inspection. This agency will issue all relevant certificates as per specification & codes. Inspection shall also be performed by a designated Third-Party Inspection agency and/or owner as set out & specified in the codes & particular documents forming this MR.

DESIGN CRITERIA

A. Metering regulating skids should typically consist of the following main equipment:

- Dry Gas filter
- Pressure reduction skid
- Metering
- Inlet and outlet isolation valves.

B. Gas Filtration System

- Filtration skid in 2x100% configuration (One working + One Standby mode), comprising all the material required to remove from the gas, the solid and liquid particles larger than 5 micron (filter, piping, valves, safety devices, instruments, wiring).
- The PSVs for each Filter shall be designed for fire case.
- Filter assembly shall be installed with davit arm.

- The withstanding capacity of the filter cartridge shall be more than 1Kg/cm2. However, the DP across the filter in operating condition shall not exceed more than 0.5kg/cm2.

C. Pressure Regulating System

- "Pressure regulating skid" in 2x100% configuration (One working + One Standby mode).
- Two pilot operated slam shut-off valve with pilot operated monitor and active regulator.
- The pressure relief valves shall be vented 3 meters above the working platform with proper support, rain cap, and bug screen. All Vents shall be left at least 3 meters above highest working point in the skid.
- Set point of the PCV pilots and slam shut valves shall be adjustable. Vendor shall furnish the adjustable range of the offered pilot and slam shut valves. The accuracy shall be + 1% over the entire range. Vendor to submit Velocity / noise calculations for PCV and slam shut Valve.
- The vendor shall confirm that the noise level for the integrated PCV and slam shut is within 85 dbA. In case noise level is ≥ 85 dbA, vendor shall provide noise treatment to limit the noise level and include silencers and expanders as required in the scope of supply.
- Stroke Time of SSV shall be less than 2 Sec or better Actual closing time of the valve shall be furnished with the quotation. Resetting of integral slam shut valves shall be only manual.
- Slam shut valves and PCVs shall have set point accuracy of 1% over the whole operating range.
- CRV/ relief Valve shall be sized for 1% of skid flow/ capacity.
- Slam shut valve and Monitor Regulator shall be Fail Close type and Active Regulator shall be failing open type.
- Leakage class for pressure control valve & slum-shut valve shall be class-VI as per FCI- 70-2-2006.
- Set point of the Gas pressure regulators (PCV's) and Slam shut down valves (SDV's) shall be adjustable. Bidder shall furnish the adjustable range of the PCV's & SDV's.
- The self-actuating Pressure regulating value shall be designed as per EN334 or Pressure Equipment Directive PED 2014/EU/68 covering the production quality assurance.
- The Slam shut valve shall be designed as per EN 14382 or Pressure Equipment Directive PED2014/EU/68 covering the production quality assurance.

GENERAL REQUIREMENTS:

- All pressure boundary materials shall have certified material test reports (CMTRs) or certificate of compliance per the design code. Certifications shall be to EN 10204 Type 3.1 for pressure parts and Type 2.2 for other parts. Bidder shall carry out 3.1 certification for all the supplied pressure parts/ mechanical items (part of skid).
- Instruments and electrical requirements shall be as per P&ID.
- The complete skid to be pneumatically tested in the factory premises @ 7 barg.
- Hydro test shall be carried out at 1.5 times than the design pressure rating.

EARTHING:

Metallic part of all equipment not intended to be live shall be connected to earth as per provisions of IS: 3043/IEC recommendation. Grounding of all electronics shall be separately connected to earth

using insulated copper wire. The grounding of electronic equipment shall not be connected to earthing for electrics or equi-potential bonding.

ERECTION, TESTING AND COMMISSIONING AT SITE

Bidder shall be responsible for erection, commissioning; performance test of system, FAT, all required testing, SAT and field trial run of DRS.

SPARES AND CONSUMABLES

Bidder shall provide for spare parts and consumables required during the erection, commissioning, testing, defect liability period and trail run.

SPECIAL INSTRUCTIONS TO BIDDERS

- Bidder shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheets forming part of Material Requisition.
- If the offer contains any technical deviations or clarifications or stipulates any technical specifications (even if in line with MR requirements) and does not include complete scope & technical/ performance data required to be submitted with the offer, the offer shall be liable for rejection.
- The submission of prices by the Bidder shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item(s).
- Suppliers must note that stage wise inspection for complete fabrication, testing including raw material inspection to be carried out.
- Testing & calibration of all instruments, Factory Acceptance Test (FAT) and Site acceptance Test (SAT) shall be carried out by the bidder. Range/ calibration span, set points, reports etc shall be modified as per the Owner's requirement by the bidder during FAT and SAT. Owner shall witness testing of any or all items at various stages during manufacture and/or at final stage before shipment at their discretion. Testing shall be carried out as per approved procedures. No instrument shall leave manufacturer's works without factory acceptance test. All necessary changes shall be incorporated/ implemented as suggested by the owner during FAT/ SAT etc. As build drawing, final technical documentation shall be submitted by the bidder. It shall contain all such changes.
- Testing & Calibration: Bidder's scope of work includes testing of all supplied items and systems including impulse lines, pneumatic signal tubes and instrument cables and special instruments/ items if any. Bidder shall also carry out testing and calibration of all instruments as per the requirements specified elsewhere in tender documents. The testing and calibration of the Gas metering system shall be as described elsewhere in the document.
- Commissioning: It is the responsibility of Bidder to co-ordinate and make available the services of vendors/ sub vendors for gas metering system package, control system, etc. and other special instruments/ equipment like Gas flow meters, Flow computers, Pressure regulators, testing, FAT, Site acceptance, start-up/ commissioning of the station. The bidder shall provide assistance during commissioning without any condition/ pre-requisite. It is the responsibility of the bidder to get the certification from site Engineer.

- Electronic Volume corrector (EVC) shall be required for RPD meter type metering skid. The system should be designed in such a way that it should operate through battery. Bidder shall submit Product Technical Literature along with offer.
- Lifting lugs and spreader beam / frame, foundation Anchor bolts, copper jumpers for flanges for the skid, Stainless steel nameplate for each tagged equipment and component; All Tie-ins with flanged connections shall be in bidder's scope. Earth bonding system and earthing boss for skid are in bidder's scope. Inlet and Outlet matching flanges and Studs &nuts (for skid interconnection and Inlet & Outlet piping connection), suitable Gaskets shall also be supplied along-with each skid.
- Bidder to provide licensed Software in the name of owner for authenticating the algorithm written in the EVC as per AGA. Bidder to provide the necessary hardware/ software (licensed in favour of owner) for configuration of EVC. Bidder to supply all the hardware / software (licensed in name of owner) for accessing data of Flow meter.
- Bidder shall take single point responsibility for the engineering, design, certification, procurement, inspection, testing, supply & performance of the Gas Pressure Reducing and custody transfer metering skids along with all instruments, equipment and valves offered/ supplied in the skids based on the data sheets and the specifications furnished, taking into consideration successful operation, safety and established International standards for the complete skids.
- As a part of skid design & engineering, the following shall be undertaken/ decided/ furnished by bidder:
  Calibration of flow Meters (using air at/ near atmospheric pressure) considering the above-mentioned overall accuracy/uncertainty. RPD meter shall be air calibrated at 5 points. RPD Meter shall be calibrated at 0.05 Qmax, 0.2 Qmax, 0.4 Qmax, 0.7 Qmax, and Qmax. (i.e. at flow rates of 5%, 20%, 40%, 70% and 100% of Qmax), subject to a minimum flow rate of 5 M3/Hr (or minimum flow rate as per calibration agency/ Laboratory).
- Based on the approved design and tender requirement, Sizing of pipes, filtration, flow meters, self-actuated Pressure control valves, Safety Shut Off (Slam Shut) valves, Pressure relief valves, Creep relief valve.
- Set points for Pressure Regulators (active, monitor) and slam shut valves.
- Instrument ranges to meet the Process operating and design conditions.
- Noise calculations for Regulators. Vendor to provide detailed Noise calculation and standard used and assumption considered (if any).
- All the instruments/ equipment to be procured as per the approved vendor list provided in bid document.
- Gas velocity in main line pipe, equipment, flow meter, main line valves, check valve etc must not exceed 20 meters/second, (except SSV and PCV), when the maximum flow rate occurs at the lowest expected inlet pressure. Velocity limit for SSV shall be 40 m/s.
- The Pressure Reduction system with 1 / 2 streams (as applicable) of Slam shut and Pressure Regulators (1 operating + 1 standby stream) shall be designed. Each stream contains one regulator (Active). Under normal conditions, the regulator is considered as active regulator. Active regulator

shall be “fail to open” or “fail to close” type (decided during detail engineering.). The vendor shall confirm that the noise level for the PCV (ACTIVE) and Slam Shut Valves is within 85 dBA. In case, noise level is ≥ 85 dBA, Vendor shall provide noise treatment to limit the noise level and include silencers or expanders as required in the scope of supply. Set Point of the PCV Pilots and Slam Shut Valves shall be adjustable. The vendor shall furnish the adjustable range of the offered pilots and slam shut valves. The construction of the Pressure Regulator shall be such that there will be no continuous gas bleeding.

- The data sheet should be filled up completely, signed, stamped and enclosed along with sizing calculations, catalogue and drawings in the Technical Bid submitted by the bidder. Technical literature in English language, along with dimensional details of the equipment and system hook up drawing shall be submitted by bidder along with the technical bid.
- Cabinet / Enclosure for entire skid shall be as per cabinet specification attached elsewhere in tender document.
- Suitable mounting arrangement/ anchoring shall be provided in skid base frame. The cabinet shall be suitable for outdoor installation. The top shall be slanted to avoid water inrush during rain. One side (front side) of cabinet shall be lockable from outside, whereas the other sides (rear, top, side etc) of cabinet shall be lockable from inside the cabinet (GAD to be got approved by Owner before proceeding for fabrication).
- Skids shall have Lifting lugs/ Hooks of adequate strength provided to facilitate its lifting and convenience in handling. Working platforms, if required, should be provided in the skids at appropriate locations (and shown clearly in the drawing) to facilitate easy access to all parts of the skid and to avoid any operational or maintenance problems.
- Switch over from active stream to the hot standby stream should take place in the event of shut down of the active stream for any abnormal reason.
- RPD flow meter shall be positioned in such a way that the index can be read conveniently. Suitable means to avoid condensation of water inside index head shall be provided by the bidder. When reading/ viewing the index head, the gas flow-direction through the meter shall be from the left to the right.
- All required cable, conduit and suitable cable gland (ex-proof) required for power, signal, pulse input, RTD shall be supplied / installed by bidder. The Supply & laying of perforated cable tray on supports and accessories required for cable laying and routing lies in the scope of the bidder. All interconnecting signal, power, control cables used in the skid shall be armoured. The signal/control cables shall be individual pair shielded and overall shielded. Bidder shall follow the cable specifications as per control cable standard specifications.
- Bidder shall carry out installation of junction boxes on separate support, JB earthing /grounding, tagging, ferruling, cable glanding & termination, pair/ core identification of all cables.
- The Supply & laying of earthing strip and earthing cables (copper) for earthing of instruments, junction boxes etc. to instrument earthing system lies in bidder’s scope. Bidder shall supply required earthing strip/ cable for earthing.

- Provision for anchoring skid (on foundation) shall be provided by the bidder. Supply of suitable anchor bolts (preferably 16 mm size) also lies in the bidder's scope.

TESTING & INSPECTION

All pressure boundary materials shall have certified material test reports (CMTRs) or certificate of compliance per the design code. Certifications shall be to EN 10204 Type 3.1 for pressure parts and Type 2.2 for other parts. Bidder shall carry out 3.1 certification for all the supplied pressure parts/ mechanical items (part of skid).

All materials and equipment shall be factory tested before shipment in the presence of the Owner's representative. No material shall be transported to site until all required tests have been carried out and equipment is certified as ready for shipment; issue of Inspection release note and delivery clearance/ advice. Acceptance of equipment or the exemption of inspection or tests thereof, shall in no way absolve vendor of the responsibility for delivering equipment meeting the requirements of the specifications.

Vendor shall furnish the following:

- Material test certificate, Hydrostatic test certificate, certificates of radiography for all line ` mounted items/ instruments on the skid.
- Certificates from statutory body for hazardous area approval for all electrical items mounted on the skid.
- Calibration certificates, certificates for custody transfer, certificates for the conformity to the standards to be submitted.
- All other certificates mentioned in individual general specification.

Bidder shall perform the usual standard tests to maintain quality control procedures. These test certificates shall be submitted for review before starting inspection by the owner. Bidder shall be responsible for testing and complete integration of the system. Detailed procedures of test and inspection shall be submitted by the supplier for review before order and mutually agreed upon.

Bidder shall include inspection by Owner/ Owner's representative at bidder's shop. For this inspection, labour, consumable, equipment and utilities as required shall be in bidder's scope. Third Party Inspectors shall be deployed by the bidder. Bidder shall propose TPI agency for Owner's approval.

PERFORMANCE & INSPECTION:

Adequate data on flow rate, Capacity, Range-ability, lock-up, minimum and maximum operating pressure differentials, dynamic performance characteristics and predicted noise level emissions, set points of slam shut valve, relief valve, active and monitor regulators etc., should be given by the manufacturer to determine the performance of the regulators under various operating conditions. Results of such tests carried out by the manufacturer to determine operational performance and thereby confirm these design data and Manufacturing Test Certificates (MTC) for all components / parts of DRS, NDT results, Welding Procedure Specification (WPS), Welder's Performance Qualification Record (WPQR), Welding Procedure Qualification Record (PQR), etc., should be made available prior to offering the complete skid for witnessing the performance testing by Owner / Third party Inspection agency appointed by Owner.

The final performance test of complete DRS skid shall be carried out in presence of third-party inspecting agency / Owner's representative before accepting the skid and giving clearance for dispatch.

Inspection Plan:

- Visual inspection of DRS skid assembly.
- Witnessing of:

o Hydrostatic & Pneumatic Testing of DRS Skid assembly, as per parameters given in tender.

o Performance testing of Regulator: Outlet pressure v/s flow (for various inlet pressures), inlet pressure v/s flow for various outlet pressures (entire range of delivery pressure), checking lock up pressure within limits, pressure setting & operation of Slam shut valve, Regulator and Relief valves.

o Stage-wise inspection to be carried out for inspection of workmanship quality and for inspection of surface preparation and primer coat / intermediate coats to ensure proper adhesion / paint quality.

o Review of all Calibration certificates, reports, test certificates for all the Valves, relief device, regulation device, filtration and measuring instruments at the time of inspection, i.e. used for checking and testing, along with the calibration certificate of the master instruments from which the instruments is calibrated.

SKID TESTING:

The following tests shall be conducted for the skid.
Hydro Testing (for the integrated skid / individual pipe spools)
Hydro testing of the integrated skid shall be carried out using water as the testing medium. The test pressure shall be 1.5 times the design pressure and holding time for the test shall be 30 min. wherever necessary, regulators, relief valves and similar components that have been tested independently should be removed from the line. Blind flanges or double flange pipes should be installed temporarily in their place. All small-bore connections and impulse lines should be disconnected and suitable plugs or blank flanges should be installed. A record of all hydrostatic testing carried out shall be prepared for every skid and shall be provided during inspection.
Pneumatic Leak Test of complete skid at 7 bar (g).
Pneumatic testing using air or an inert gas should be undertaken on all installations and should include all equipment and associated small bore pipe work. Care must be taken to disconnect equipment, which might get damaged at the testing pressure.
It should be confirmed that all the main, bypass and impulse valves within the section under test are in open position. Any open ends should be blanked off. The installation should be pressurized slowly up to the recommended test level as detailed in specific requirements column.
All joints, flanges and glands on valves and fittings should be tested for leakage with suitable foaming fluids.

TEST OF SKID EQUIPMENT/ INSTRUMENT

Flow Meter, Meter run, EVC shall be offered for pre-dispatch inspection to Owner/it's representatives. Following tests, checks shall be conducted.
Review of all certificates and test reports. In the event, the purchaser is unable to witness a test, the test shall anyway be completed by the vendor and documents for the same shall be submitted for

scrutiny before shipment. All tests as per Standard specifications are attached with this bid document.

The following tests shall be carried out by vendor at their work and test certificates shall be furnished:

- Calibration/ test certificates for all instruments. Calibration test reports for flow meters duly signed and certified from the recognized international laboratories / statutory weights and measures authority. Statutory body certificates for instruments.
- Type test report for JB and enclosure of all electronics/ electrical equipment. Radiographic / Charpy test certificates for RPD Meters. Material test certificate for all line mounted instruments. Dimensional test report Certificates for custody transfer application and other certificates mentioned elsewhere.

Skid functional testing considering metering, pressure regulation, limiting and safety characteristics. (Functional testing of Slam shut valves, PC's (active & monitor) shall be demonstrated by simulation in vendor's shop). The same test shall be performed and demonstrated during FAT.

Inspection of Slam Shut Valves, Pressure Regulators, and Pressure Relief Valves shall include the following:

- Test to demonstrate set point accuracy and actuation time for Slam shut valves.
- Calibration certificate for Pressure relief valve set pressure.
- Seat tightness test for PCVs (Active and Monitor), Slam shut valves and pressure relief valves. (Tests shall be conducted at manufacturer's workshop and certificates shall be submitted).

Test Certifications:

A record of all hydrostatic testing and pneumatic testing carried out should be prepared for every installation. A material test certificate for all components of DRS should be furnished at the time of inspection by third party/ GASONET representative.
Supplier shall perform the usual standard tests to maintain quality control Procedures. The purchaser shall submit these certificates for review before starting the inspection. Suppliers shall be responsible for testing and complete integration of the system.
Detailed procedures of test and inspection shall be submitted by the supplier for review before order and mutually agreed upon.
Inspection will be done by Owner/ Third Party Inspector at vendor's shop. For this inspection, labour, consumable, equipment and utilities as required shall be in the vendor's scope.
Testing and inspection work have to be carried out at Vendor's works or works designated by the Vendor.
The Vendor must submit certificate EN 10204 3.1 stating the relevant quality of the Supplied DRS.

DOCUMENTATION:

The Purchaser in vendor data requirement sheets indicates detailed drawings, data and catalogs required from the vendor. The required number of reproducible and prints should be dispatched to the address mentioned, adhering to the time limits attached.

Final drawings from the vendor shall include dimensional details, weight, mounting details and any other special requirements etc. for the skids. All dimensions in general shall be in millimetres. Vendor shall furnish all manuals necessary to test, operate and maintain the system. The Vendor shall submit the following documents in Minimum 3 sets,

- Performance specification and Test certificate.
- Construction drawings, material specification and technical data sheets.
- Instructions and recommendations regarding installation, operation and maintenance of all the components of the unit.
- Spare part list.
- Material test certificate for all the pipe and fittings material.
- Hydrostatic and Pneumatic test certificates.

Note: P&ID shown in tender is tentative. However, bidder has to do the sizing and ensure engineering as per PNGRB T4S guidelines.

DATASHEETS, PIPING AND INSTRUMENTATION DIAGRAM

NOTE: PIPING INSTRUMENTATION DRAWING (P&ID) IS ATTACHED SEP

DATASHEET OF RPD METER	
Subject	Description
Meter Type	Rotary Positive Displacement Type Meter
Service	Natural Gas
Make & Model	To be specified by Vendor
Qty	Vendor to Specify
Maximum Operating Pressure	Refer P&ID
Normal Operating Pressure	Refer P&ID
Working Temperature Range	5 Deg C to 55 Deg C (Ambient & Gas Temp.)
Rangeability	1:100 or Better
Accuracy	±2% (Qmin to 0.2 Qmax) ±1% (0.2 Qmax to Qmax)
Maximum Index reading:	999999.99
Repeatability	Batter than +/- 0.5%
Unit	Cubic Meter
Reverse flow Restrict	Essential. If not in-built non return valve to be supplied
Casing	As per applicable codes, Tamper proof & corrosion resistant Aluminum or Steel suitable for Indoor/outdoor installations
Connection Orientation	Multi Position
Meter Internals (Impellers, Impeller Shaft, Bearing, Gears (Timing & Reduction, Magnetic / Inductive coupling, O-rings / Gaskets)	Non-Corrosive, tested low noise, friction less, endurance for minimum 15 years life & external tamper proof. Plastic components not to be used in Meter.
Installation	Suitable for Outdoor Installation, Tamper proof, water weather proof and corrosion resistant for a life period of 15 years.
Ingress Protection	IP 65 or Higher
Safety Approval	ATEX
Area Classification	Zone 1, Group IIA / II B, T3
End Connections	Class 150 in accordance with ASME B 16.5
Flange to Flange Dimension	Vendor to Specify
Approved to	EN-12480 or equivalent The meters shall be approved by India Metrological Department (Model Approval)

Pulse Output	Vendor to Specify
Pressure tapping & Temperature Element	Inbuilt Pressure Tapping & Temperature Element
Volume Correction	EVC can be either inbuilt with RPD meter or mounted on meter.
Note:	
1. The selected meter shall be suitable for Custody Transfer. Vendor to submit Custody transfer approval certificate from laboratory which can provide the same or MID certificate	
2. The meters shall be type approved by weights and measures department and Vendor shall furnish Legal Metrology Certificate issued by Weights & Measures, India	
3. Bidder to provide Calibration Certificate and Accuracy at atmospheric pressure with air for the following flow rates: Qmin, 0.2 Qmax, 0.5 Qmax, 0.70 Qmax and Qmax. It can be vary based on Manufacture requirement.	
4. In case of RPD meter conical filter size shall be installed at the upstream of meter. Provision should be made in the design of pipe work to enable removal of strainer for cleaning and inspection.	
5. Necessary restricted orifice suitable for the respective RPD shall be provided by the bidder.	
6. 500 ml of suitable Oil with each Meter and all necessary accessories	
7. The Meter shall be indelibly marked with details of Max. Flow, Pressures range, direction of flow, name of the manufacturer, model, unique serial number, Date of manufacturing etc.	
8. The Vendor shall submit, along with the offer, the manufacturing standards, Model number, performance curves, and approvals of the statutory bodies and technical details of the model offered. Successful Vendor shall submit following documents during Supply of material. a) Dimensional outlet with mounting details with model number, part list and technical literatures. b) Connection by purchaser (piping, Electrical etc.) c) Installation, Operation and Maintenance Instruction Manual. d) Testing and Inspection procedure. e) Original Calibration curve of each RPD meter f) Certificate from statutory bodies Certificate	
9. Superior quality Flange nuts and bolts, required mounting accessories etc. are to be supplied	

DATASHEET OF ELECTRONIC VOLUME CORRECTOR	
Subject	**Description**
Type	Microprocessor based, internal battery-operated Electronic Volume corrector with integral pressure transmitter and temperature sensor suitable for mounting in the field location. EVC may be separately mounted on yoke or inbuilt with RPD
Make & Model	To be specified by Vendor
Qty	One for each meter
Approval	Custody transfer approval
Function	To measure actual gas volume, pressure and temperature and calculates compressibility factors of the gas, Meter error and based on which calculates standard volume of gas. The unit shall be complete in all respects to achieve this functionality.
Installation	Suitable for Outdoor Installation, Tamper proof, water- weather proof and corrosion resistant for a life period of 20 years.
Ingress Protection	IP 65 or Higher
Safety Approval	ATEX
Hazardous area	Certified intrinsically safe for area classification Zone 1, Group IIA / II B, T3.
Working Temperature Range	5 Deg C to 55 Deg C (Ambient Temp.)
Inputs	LF / HF Pulse signal from meter and complying with EN12480
Output	One no. port for Connectivity to PC/Laptop for EVC configuration. Communication cable with adaptor for connecting the EVC with laptop
Calculations standard	i. Volume Flow calculations: AGA7 (Latest). ii. Compressibility: AGA 8 (Latest) - User selectable Detailed / Gross I / Gross II Methods (Default: Detailed).
Alarms	b) Battery Low b) Flow Over Range c) Fault-in Measurements
Displays	Alphanumeric large character LCD with selectable decimal, Displaying all units, messages, alarms etc shall be in English.The display can be configured by the user or retain the standardconfiguration as follows:a) Time & Date b) Uncorrected flow rate – m3/hr c) Corrected flow rate: Sm3/hr d) Corrected Totalised volume : Sm3 e) Uncorrected Totalized Volume : m3 f) Corrected Flow Yesterday: SCM g) Uncorrected flow Yesterday CM h) Corrected Flow Today: SCM i) Uncorrected flow today: CM j) Pressure : Kg/cm²g k) Temperature :°C l) PTZ Correction factor m) Battery Voltage) Alarms

Output Measurement	i) Un-corrected flow rate in actual cubic meter per hour (ACMH) j) Corrected flow rate k) Temperature l) Pressure m) Alarms output for unit malfunctioning n) Corrected Volume o) Correction factor p) Compressibility
Power supply	No separate power supply will be provided
Internal Battery Life	Internal Battery along with mounting hardware, if any Lithium (10 years minimum life) Battery pack should be intrinsically safe and replaceable in Field itself, without memory loss
Accuracy of the system	+ / - 0.5 (Vendor shall categorically indicate the system accuracy i.e. overall accuracy considering RPD meter, Pressure sensor & temperature sensor etc.)
Configuration Setup	To be done in factory for all EVC fully taking into account the process conditions, sensor & flow meter's characteristics and calibrations for direct on-site operations.
Features	a) Built in diagnostics to detect proper functioning.b) Data security through password/key-lock facility and volume conversion and configuration to be sealed.c) Parameters and programmed constants shall be stored in EEPROM / non-volatile memory.d) Facility for entry and accessing live and stored data through external Laptop/ PC.e) Shall have to store at least 120 days data (on Daily &hourly basis) for flowing pressure, temperature, uncorrected flow and corrected flow with date and time stamping.f) Storing of Audit trail and alarm summary.g) The stored data above shall be retrievable by using Laptops. Suitable port shall be available for Laptop's connection. Software required shall be supplied. All cables, software required for calibrating, configuring, retrieving the data to be supplied.h) Modbus facility for any third-party software with Modbus registers address changing facility
Mounting	EVC can be either inbuilt with RPD meter or mounted on meter. In case EVC is mounted on RPD meter, Vendor shall supply all necessary cables, SS tubing, manifold etc which all are required for integrating RPD meter with EVC along with suitable Mounting frame/arrangement.
Accessories to be supplied	5. In case EVC is mounted on RPD meter, Vendor shall supply all necessary cables, SS tubing, manifold etc which all are required for integrating RPD meter with EVC along with suitable Mounting frame/arrangement. 6. Software and its license for retrieving the stored data, Calibration and programming the EVC using portable PC (Laptop), remote software based on Windows 8(or latest) shall be supplied preferably in the form of Pen drive. 7. The Modbus communication protocol and message structure details to be used for SCADA shall be supplied. 8. Communication cable for communicating EVC with laptop (1 between a lot)

Documentation	Following drawings/documents shall be supplied:· EVC Configuration and calibration records· Catalog/product data sheet· Instruction, Operation & Maintenance manual in soft and hard copy.· Warranty certificate· Documentation including product literature, software/hardwaremanual, operating manual, maintenance instructions, Certificates etc. shall be supplied one each with all EVCs.·
Note:	
1) For each EVC – Windows based Software (with media) of latest version - for retrieving the stored data, programming the volume corrector using Laptop shall be supplied with valid license.	
2) Sets of Volume corrector documentation including product literature, software/hardware manual, operating manual, maintenance instructions, Certificates etc. shall be supplied.	
3) EVC shall have Weights & Measures Type approval. If it is not available with the Vendor, Vendor has to submit an undertaking along with the bid that in the event of any purchase order placed on them, EVC will be supplied along with W&M approval.	
4) Following features shall be available in volume corrector: - 1. Flash memory with non-volatile copy of program code. 2. Programmable peripheral chip with EEPROM contains boot ladder code. 3. SRAM with copy of program code and data/exact logs. 4. Flash memory preservation shall be achieved by 5-year data unpowered retention. 5. SRAM memory preservation shall be backed by Lithium Cell / Super capacitors.	
5) Vendor/Supplier shall configure and update records in Volume Corrector as per technical requirement and data sheet before Final Inspection call. The process parameter and the required measuring units are already specified in Data sheets/ tender documents, and it shall be made available in Volume Corrector. All the specified function and features shall be demonstrated during the Final inspection.	
6) The EVC shall transfer data to SCADA and shall be possible to read data from the SCADA (by wireless connection). SCADA, wireless connectivity and connection to the SCADA will be provided by Bidder's.	

AMR/MODEM SPECIFICATIONS

- ATEX / PESO Ex Zone 1 Compliance
- Battery: 3 ~ 5 years (1 timestamp per day)
- Modems shall be powered by non-rechargeable batteries; the bidder shall ensure battery life of 3 to 5 years (in case of sending data one time daily). The life of battery shall be counted from the date of commissioning. The battery should be replaceable and encapsulated inside the unit causing to avoid tampering to disconnect power supply.
- Modem must be able to go under deep sleep mode for battery optimization.
- Serial interface for reading out of electronic volume correctors (EVC).
- External Enclosure Door Opening Alert & Modem Tampering alerts
- RS232 / RS485 interface and configurable with native EVC communication to get all the parameters of EVC not limited to few parameters. Data communication in native language means that the EVC data should be acquired using original EVC communication protocols such as iFlag, GazModem, DLMS, Elgas Protocols, etc.
- Modem must be designed such that Modem should be compatible with all Makes/Models of EVC given by CGD. Also, Bidder to ensure compatibility of Modem for future EVCs procured by the CGDs
- Communication Medium: 4G
- IoT Communication Protocol: MQTT / COAP
- Inbuilt Network diagnostics for ensure reliability
- Modem should be designed with connectivity logics keeping in mind the conditions of Indian congested & “Noisy” Areas to ensure 24 x 7 connectivity of the AMR System
- Reports: CSV, FTP, Email, HTTP, XML
- Ambient Operating Temperature – 0 Deg C to +75 Deg C
- Modem to have a display for configuration on-site
- External control button required with navigation to trigger manual transmission or operation selection.
- Highly accurate TCXO RTC to be used in the Modem for Time accuracy and reliability.
- RTC time synchronized storage in Modem, Must record data reading with actual timestamp for reliable and accurate meter data reading
- Modem must be able to remotely setup & configure EVC with compatible baud rates of EVC
- Heartbeat broadcast from Modem for Modem Health diagnostics like Network, Device Battery, Signal strength, etc.
- 4G Modem is to be safely housed in an IP55 all weather-proof, Hinge type Outer Panel enclosure with Screws, Screw Plugs for Panel Enclosure & Pipe for EVC cable protection
- Meter index readings need to be sent at server end every 24 hours. This data shall be provided to client on daily basis on portal designed by bidder also this data should be exportable in the form of excel/csv and shall be linked to SAP / CGD’s Billing Software as well.
- User Settable daily trial counts for establishing successful server communication with modem must be possible to ensure data reception of Modems in low network areas.
- Modems must have an adaptive facility to automatically stop remaining trials incase of data successfully received at server from device on any previous trials to save battery.
- Every available parameters data Backfill of 3 months (or as per EVC memory) must be possible through the modem to ensure automatic data reading and maximum data availability.

- Modem to have FOTA (Firmware Over-The-Air) update capabilities to remotely update the firmware for updates in future. Modem should have inbuilt Bluetooth / BLE / WiFi module to communicate nearby for FOTA at Site (This is required incase of low/no 4G network availability at sites)
- 4G Modem to have suitable IP rating as per standard of IEC 60529: Degrees of Protection Provided by Enclosures (IP code),
- Modem to be RoHS compliant
- Data security shall be ensured by bidder and data must be encrypted to global AES 128 standards.
- 4G IoT (M2M) SIM cards must be provided in-built in Modems
- Bidder shall co-ordinate with network service provider for configuration of SIMs. Client shall interact with supplier only which means client shall not co-ordinate directly with network service provider.
- Modems shall be capable of bi-directional communication; also they should have facility for remote configuration. The existing meter readings of all customers must be read into central server.
- The device shall be equipped with tamper deterrent seal, in case of any tampering with modem or EVC it should generate alarm and create alert on central server which should be visible on Web portal.
- Bidder shall ensure performance of modem in the temperature range of 0 deg.C to 50 deg.C and relative humidity of 100%. Modem must at least IP 55 protection or better for retrofits to be installed in industrial/commercial areas, also suitable for installation in hazardous area under classification ATEX Zone 1.
- When the device is turned ON, it should send uplink message containing OEM identifier, Model No., Firmware version, current configuration of the device.
- The modem should have an inbuilt logic to perform soft reset/auto reboot on its own in case of communication error.

SOFTWARE & SERVER SPECIFICATIONS

- The CGD plans to deploy a Meaningful, Customized, Human Centric Dashboard for Easy Data Monitoring, representation and reporting.
- Software shall display total volume as well as location, GA, State, and cluster wise volume of data
- The central server (hardware for the server i.e. PC, laptops, tough books etc.)/cloud server required for the proposed system will be in the scope of bidder. The required software etc. will be in the scope of Bidder.
- Software must be able to send data over OPC protocol
- Bidder shall provide the data accessibility for integration with other software like SAP, Billing Software, etc.
- The data transfer should be in such a format which is readily available for processing, access, read and uploaded in SAP or other systems. Data should be saved in compatible formats like csv/txt.
- AMR should have ability to send the data to server directly using Internet. If any application is required to be installed at server for accessing the data, it will be in the scope of bidder.

- Data should be provided in general data format for integration with General Service platform (GSP)/Business Analytics (BA), Dashboard as per Client requirement.
- Cloud server should comply with ISO 27001.
- Data security through password facility and hardware sealing.
- Parameters and programmed constants shall be stored in memory.
- Server should be capable to store Daily log and event logs for upto 5 years.
- System should be capable of integrating new customers in future.
- Integration of the AMR Server with other software for exchange various data base and generation of required reports.
- Any other IT related infrastructure change and modification required for successful deployment of the project.
- Firmware or software upgrade as and when required,
- Provide Alarms, Data Analytics, Exception Reports etc.,
- Provide a monthly report for all system performance parameters,
- Provide 99% average availability of Server. Bidder may be penalized for non-availability of server as per the penalty clause.
- Implementation of Configuration Change in the AMR, whenever Billing cycle frequency is modified/ amended.
- Minimum 98% readings with SLA based agreement shall be through automatic system
- Hourly, weekly, Monthly or customized reports as per Client requirement should be generated analysis purpose.
- Daily exception report should be submitted by the bidder.
- The software used should be capable of generating trends, alarms and graphics. Any updation /modification in reports/formats as per Client requirement should be done by the bidder.
- Integration of exhaustive analytics as desired by client – shall be configured by bidder. Bidder should provide the 4G network signal strength on portal (live screen)
- Network synchronization & diagnosis logs to be maintained in Dashboard for SLA
- The command buffering and execution response reports should appear on the dashboard during device wakeup time.
- The Remote EVC Configuration setup panel must be visible on the dashboard.
- To ensure cyber security, the web dashboard should be compliant with Vulnerability Assessment and Penetration Testing.
- Asset Management: AMR should be capable of supporting multi-layered collection network infrastructure consisting of device/meter, 4G network, Cable/Probe/EVC and metering related components.
- There should be facility to attach images / videos / PDFs consumer-wise for history track record of installation / maintenance proofs.
- The relationships between network topology structures and physical locations must be specified and displayed in the form of maps and topological graphs.
- AMR software shall have EVC communication driver inbuilt for data collection and same parameters of data display in prescribe format which define by CGDs.
- Grouping of meters/appliances on Building/Society/Street/Area wise basis for efficient customer management.
- Batch wise synchronizing of customer and meter/device change information and periodic logging works.

- Bidder will have to give technical/service operation.
- Information of device status, alarm information and service alerts should be synchronized.
- AMR self-diagnose of health of remote EVC based on collected parameters of data and generating alarms.
- Heat mapping of customers, devices / meters, customer types, price, etc. Service Data Analysis
- Volume-based heat mapping service data analysis of customers, appliances/meters, customer type, price, etc. and value-based flow analysis should be visible.
- The period-based requirement distribution analysis should appear.
- There should be essential supply forecasting analysis.
- Manual adjustment can be done to maintain the gas meter reading Manual adjustment is to be done through approval process certified by the designated authority in the web dashboard. Manual adjustment approval, log, approval status, timeline, requester and approver's IP address to be entered on the web dashboard.
- API call log, history and records are to be maintained in the web dashboard.
- Latest OAuth 2.0 API or better, integration protocols are to be used for 3rd Party Software / Billing Software / SAP integration. The SAP API has to have the facility to identify the type of record, i.e. manual or automated record.
- Information collection and services should be available to end users through the Internet.
- AMR Software shall have a comprehensive task/complain management facility for internal tracking with user assignment, dedicated task dashboard and analytics.
- Software shall have WhatsApp Integration for quick & on demand data analytics and for highly attentive data available hands-on for connectivity assurance, failure reports, etc.

Below key Modules / User Interface should be available in the offered Software

Sr. No.	Applicable Module	Contents
1	Dashboard	Google Map View: Devices are shown on Map with Active & Offline classification.
		Total Actual Consumption for Month (till date) in SCM
		Total Planned Consumption for Month
		Consumption Trend
		Actual vs Planned Consumption Trend
		No consumption detection details, Consumption Pattern report, Gas reconciliation through DRS.
2	Status Reporting	Battery Health in terms of Healthy, Low, Critical.
3	Report	Consumption Reports with selected date range in excel format - Consumer wise & Zone wise.

4	Device Management	Device Mapping to Consumer Property & History.
5	Consumer Management	Consumer Hierarchy & Zoning.
6	Bill Generation	Facility should be provided.
7	API Integration, SAP Integration Portal/App	Total Actual Consumption for Month (till date) in SCM as per client requirement.
8	Integration with other software systems	OPC protocol available
9	Alert Notification	SMS, WhatsApp & Email notification must be available
10	Network feasibility report	Network Analytics & Network Diagnostics

DATASHEET OF BALL VALVES (800#)		
Sr. No.	Subject	Description
1	Valve Manufacturer	Vendor to Specify
2	Valve Size (NB), mm (inch)	800 #
3	Design Standard	BS EN ISO 17292: 2004 / API 6D
4	Connecting Pipeline Design Pressure	19 Kg/cm2
5	Design Temperature, °C	0°C to +65°C
Valve Construction Design		
6	Configuration	Full Bore
7	End Connections	Socket Welding End
8	Ball Mounting	Floating Ball / Trunnion Mounted TMBV are applicable only if size of valve is 4"X300# and above
9	Valve Operator	Lever operated
10	Valve type / Design	Ball Valve, 1 Piece Construction / Bolted 2 Piece Construction
Valve Material Specification		
11	Body	ASTM A 105
12	Ball	ASTM A 182 Gr. F6 / F 304
13	Stem	ASTM A 182 Gr. F6 / F 304
14	Stem Seals	PTFE
15	Stud Bolts/ Nuts	ASTM A 193 Gr. B7/ A194 Gr. 2H
16	Fire Resistant Design Requirement	API 607: 2005
Others Requirements		
17	Ball Position Indicator	Open / Close Indicator, Required
18	Mechanical Stops	For Open / Close Limits, Required
19	Stem Design	Anti Blow Out Type
20	Anti Static Design	Yes

DATASHEET OF BALL VALVES		
Sr. No.	Subject	Description
1	Valve Manufacturer	Vendor to Specify
2	Valve Size (NB), mm (inch)	1" and above
3	Design Standard	BS EN ISO 17292: 2004 / API 6D

4	Connecting Pipeline Design Pressure	19 Kg/cm2
5	Design Temperature, °C	0°C to +65°C
Valve Construction Design		
6	Configuration	Full Bore
7	End Connections	Flanged End
8	Flanges (wherever applicable)	Raised Flange
9	Ball Mounting	Floating Ball / Trunnion Mounted TMBV are applicable only if size of valve is 4"X300# and above
10	Valve Operator	Lever Operated
11	Valve type / Design	Ball Valve, 1 Piece Construction / Bolted 2 Piece Construction
Valve Material Specification		
12	Body	A 216 Gr. WCB
13	Ball	ASTM A 182 Gr. F6 / F304
14	Stem	ASTM A 182 Gr. F6 / F304
15	Stem Seals	PTFE
16	Stud Bolts/ Nuts	ASTM A 193 Gr. B7/ A194 Gr. 2H
17	Fire Resistant Design Requirement	Type test as per API 607 for Floating Ball Valve Type test as per API 6FA : 2008 for Trunnion Mounted Ball Valve
Others Requirements		
18	Ball Position Indicator	Open / Close Indicator, Required
19	Mechanical Stops	For Open / Close Limits, Required
20	Stem Design	Anti Blow Out Type
21	Anti Static Design	Yes

DATASHEET OF PG		
Sr. No.	Subject	Description
1	Make	Vendor to Specify
2	Type/Model	Vendor to Specify
3	Standard	BS EN 837
4	Type	Direct
5	Mounting	Local
6	Dial Size	100 mm
7	Window material	Shatter proof glass
8	Pressure Element	Bourdon tube
9	Element material	SS316
10	Socket material	SS316
11	Accuracy	±1% OF FSD
12	Colour	White with black numerals.
11	Case Material	Die-cast Aluminum
12	Range	0 to 10 Bar (Inlet) and 0 to 4 Bar (Outlet) or other may be suitable

DATASHEET OF TG		
Sr. No.	Subject	Description
General		
1	Make	Vendor to Specify
2	Type	Filled System
3	Well	REQUIRED
4	Mounting	LOCAL
5	Flange Material	ASTM A 105
6	Flange (Rating / Face / Finish)	150# / RF / AARH
7	Dial Size	100 mm
8	Colour	WHITE (Non rusting plastic with black figs.)
9	Window material	Shatter Proof Glass
10	Conn. Location	Bottom
11	Accuracy	±1% FSD
12	Enclosure	Whether Proof to to IS2147
13	Enclosure class	IP 67 / NEMA 4
14	Zero adj. Screw	Micrometer Pointer (Internal)
15	Case Material	DIE CAST ALUMINIUM (EPOXY PAINTED)
Filled System		
16	SAMA Class	V B
17	Compensation	Case
18	Bulb type	Adjustable Union
19	Bulb material	316SS
20	Bulb union threaded to	½” NPT(M)
21	Extension type	RIGID
22	Bulb dia	8 mm (Min)
23	Over range protection	130% of Range
Thermowell		
24	Material	SS 316
25	Construction	Drilled Bar Stock

26	Process connection	1 ½" FLANGED
27	Gauge connection	½" NPT (F)
28	Options	1. Liquid Filled
DATASHEET OF FILTER		
Sr. No.	Subject	Description
1	Make	Vendor to Specify
2	Type/Model	Vendor to Specify
3	Filter	Cartridge
4	Type	Horizontal / Vertical
5	Design Temperature, °C	0°C to +65°C
6	Particle / Mesh Size	5 Micron
7	Maximum Working Pressure	6 Bar
8	Design Pressure	19 Bar
9	Efficiency	99%
10	Design Code:	ASME SEC-VIII DIV-1 (LATEST EDITION)

Pipe Works and Fittings		
1	Pipe work	API 5L OR ASTM A 106 Gr. B
2	Fittings	ASTM A 234 GR WPB, ASTM A105
Painting		
1	Specifications	BS 4800 CANARY YELLOW FINISH
Noise Level		
1	Specifications	<= 85 dBA @1 Metre length

DATA SHEET – CRV		
1	Tag No	CRV
2	Type Of CRV	Direct Acting Spring Diaphragm type
3	Process Con. / Rating	150#
4	Service	OVER PRESSURE RELIEF- Natural Gas Service
5	Standard	As per PNGRB T4S
6	Model No.	*
7	Fluid / State	Natural Gas (G)
8	Inlet Pr. (Min/Opr/Max)	**
9	Outlet Pr. (Min/Opr/Max)	**
10	Temp. (Min/Opr/Max)	**
11	DP Sizing	*
12	Set Pressure	*
13	Set Pressure Range	*
14	Design Factor	*
15	Max. Capacity	Designed for 1% of skid flow
16	Predicted Noise dBA at 1 M	85
17	Impulse Connection	*
18	Impulse Size	*
19	Leakage Class	ANSI CLASS VI
20	IBR Certification	NO
21	Body	A 479/A217 -
22	Plug	*
23	Diaphragm	Nitrile/ Synthetic rubber Any compatible to service
24	Actuator / Spring Casing	SS304 / SS316
25	Spring	SS304 / SS316
26	Set Screw	SS304 / SS316
Note:		
1.'**' As Per P & Id, '*' Vendor Shall Furnish a Schematic Indicating all the Impulse Line Connections, Locations, Min. Distant and Sizes to the CRV.		
2. Vendor Shall Furnish the Sizing Calculations along with offer		

DATA SHEET - SLAM SHUT DOWN VALVE (VALVES INTEGRAL WITH PRESSURE CONTROL)		
UNITS: Flow > Liquid - m*3/hr, Gas-SCMH, Steam - kg/hr. Pressure -> kg/cm 2(g), Temperature- °C, Level/ Length-> mm		
1	Line Size/Schedule	*/*
2	Service	Natural Gas
3	Type of Valve-Actuator	Pilot
4	Standard	EN 14382 (SSV) and EN334 for PCV
5	Failure Position	Fail to Close Type
6	Design Class	150#
7	End Conn: Flgd. Size & Rating	FLANGED ENDS ANSI 150 #, (rating same as upstream pipe), RF 125 AARH
8	Body & Cover Material	ASTM A 216 Gr. WCB
9	Seat /Disc Material	SS 316 or any compatible to service and withstanding the pressure requirement
10	Impulse Connection	Vendor to Specify
11	Accuracy	As per EN 14382
12	Other Wetted Parts	SS 316 or any compatible to service and withstanding the pressure requirement
13	ANSI Leakage Class	ANSI -CLASS VI / EN14382
14	Failure Position for Regulator	Fail to Open
15	Manual Reset	Required
16	Position Indicator	Required
17	Closing Time	Less than 2 Sec / As per BS EN 14382 Or better
18	Provision for Limit Switch	Required (One each for Open/Close Position)
19	Fluid / State	Natural Gas / Vapour
20	Flow Liquid_Min	**
21	Flow Vapour_Min	**
22	Inlet Pr._Min	**
23	Outlet Pr._Min	**
24	Delta Pr. Shut Off	*
25	Temp. ° C Oper.	**

26	Maximum Flow Capacity	**
27	PCV Set Point	*
28	Predicted Sound Level DBA	As per PNGRB guideline
29	Inlet Velocity M/S	As per PNGRB guideline
Note:		
1.**' As Per P& Id and * - To Be Furnished by the Vendor		
2. Spring Shall Be Suitable to Adjust Outlet Pressure Range of Skid Indicated in the P&ID. And Overpressure Spring Range to Be Decided During Detail Engg.		
3. Vendor Shall Furnish a Schematic.		
4. Vendor Shall Furnish the Sizing Calculations along with offer		
5. Vendor Shall Furnish Spring Ranges		
6. The Selected Size & Model Shall Be Such That the Valve Must Operate and Control Pressure at Both Min. And max. Flow Rate as Indicated with the Given Pressure Conditions.		

DATA SHEET – PRESSURE REGULATOR (MONITER / ACTIVE)		
UNITS: Flow > Liquid - m*3/hr, Gas-SCMH, Steam - kg/hr. Pressure -> kg/cm 2(g), Temperature-°C, Level/ Length-> mm		
1	Line Size/Schedule	*/*
2	Service	Natural Gas / Vapour
3	End connection	FLANGED ENDS ANSI 150 #, (rating same as upstream pipe), RF 125 AARH
4	Body & Cover Material	ASTM A 216 Gr. WCB
5	Internals	SS 316/ SS410/ Or suitable any other material for withstanding the pressure requirement and Compatible to Natural gas service
6	Material of Diaphragm	Nitrile or Synthetic Rubber or Any compatible to service and withstanding the pressure requirement
7	Regulator	EN 334: 2005
8	REGULATION ACCURACY	+/- 1% OF SET OUTLET PRESSURE (G) OR BETTER
9	COMPONENTS FOR GAS SUPPLY	SS 316/DIN 30690 PART-1 / DIN 30690 PART-2 (LATEST) OR EQUIVALENT
10	Impulse Connection and Size	External and *
11	Spring Range	*
12	LEAKAGE CLASS	AS PER EN 334
13	Provision-Limit Switches	YES REQUIRE, ONE EACH FOR OPEN / CLOSE POSITION
14	Provision for Limit Switch	Required (ONE EACH FOR OPEN / CLOSE POSITION)
15	Manual Reset	Yes, Required
16	Failure Position	Fail to Open
17	Position Indicator	YES, REQUIRED
18	Closing Time	LESS THAN 2 SEC
19	Fluid & State	DRY NATURAL GAS
20	Temperature o C -Working/Design	** / **
21	Inlet Pressure: MIN / NORMAL / MAX	** / **
22	FLOW: MIN / NORMAL / MAXIMUM	** / **
23	Design Pressure	150 Class
24	Predicted Sound Level DBA	As per PNGRB guideline
25	Inlet Velocity M/S	As per PNGRB guideline
Note:		
1.**' As Per P&ID and * - To Be Furnished by the Vendor Shall Furnish A Schematic Indicating All the Impulse Line Connections, Locations, Min. Distant and Sizes to The Main Valve and To the Slam Shut Valves		
2. Vendor Shall Furnish the Sizing Calculations along with offer		
3. PCV Shall Be as Per EN 334		
4. Spring Shall Be Suitable to Adjust Outlet Pressure Range of Skid Indicated in the P&ID. Set Point - By Vendor.		

VENDOR LIST

PRESSURE REGULATOR AND SLAM SHUT VALVE

7. M/s Emerson Process Management (Fisher / Tartarini)
8. M/s RMG-Regel Messtechnik / Bryan Donkin (Germany)
9. M/s Nirmal Industrial Controls (India)
10. M/s Gorter Controls (Netherlands)
11. M/s Dresser
12. M/s Gastech Natural Gas Equipment

RPD METER

2. M/s Itron (Formerly, Actaris / Schlumberger).
3. M/s Elster-Instromet.
4. M/s Smithmeter.
5. M/s Dresser
6. M/s Romet, Canada
7. M/s MetreG

VOLUME CORRECTOR

8. M/s RMG Messtechnik Gmbh, Germany
9. M/s Elster (Honeywell)
10. M/s Daniel Flow Products inc.,USA
11. M/s Dresser, (Rockwin Flow Meter,India)
12. M/s Itron (Formerly, Actaris / Schlumberger).
13. M/s Barton Instruments, UK
14. M/s Romet,Canada.

PRESSURE GAUGES, D. P. GAUGES & TEMPERATURES GAUGES

8. M/s AN Instruments Pvt. Ltd.
9. M/s General Instruments Ltd.
10. M/s WIKA
11. M/s Forbes Marshall
12. M/s Hirelkar
13. M/s Baumer
14. M/s Mass

JUNCTION BOXES AND CABLES GLANDS

5. M/s Ex-Protecta
6. M/s Flameproof Control Gears
7. M/s Baliga
8. M/s Flexpro Electrical

SS VALVES, SS TUBE & SS TUBE FITTINGS

5. M/s Parker (USA)/ M/s Swagelok (USA)/ M/s Hoke/ M/s SSP –SS fittings
6. M/s Sandvik, Sweden, M/s Tubacex –SS tubes
7. M/s Parker, M/s Swagelok –SS valves
8. M/s Arya – SS Fittings

BALL VALVE

15. M/s Hopkinsons Limited (UK)
16. M/s O.M.S. Saleri (Italy)
17. M/s Pibi Viesse SPA (Italy)
18. M/s Nuovo Pignone (Italy)
19. M/s Perar SPA (Italy)
20. M/s Larsen & Toubro Ltd. (Audco India Limited, Chennai)
21. M/s Microfinish Valves Ltd. (Hubli)
22. M/s Raimondi Valve S.P.A. (Italy)
23. M/s Virgo Engineers (Pune)
24. M/s Petro valves
25. M/s Tormene Gas Technology S.P.A. Valvetalia Group, Italy
26. M/s Hawa
27. M/s S.S.Engineering Works
28. M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)

GLOBE VALVE

11. M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)
12. M/s Datre Corporation (Kolkota)
13. M/s L & T, New Delhi
14. M/s Neco Schubert & Salzer Ltd. (New Delhi)
15. M/s Niton valve (Mumbai)
16. M/s Ornate valves (Mumbai)
17. M/s Panchvati valves (Mumbai)
18. M/s Hawa
19. M/s Petro valves
20. M/s S.S.Engineering Works

CHECK VALVES

19. M/s Malbranque (France)
20. M/s Mannesmann Demag (Germany)
21. M/s Petrol Valve (Italy)
22. M/s True Flow Rona (Belgium)
23. M/s. Expert
24. M/s BDK Engineering India Ltd. Hubli, Karnataka / M/s Weir BDK Valves (A unit of Weir India Pvt. Ltd.)
25. M/s Neco Schubert & Salzer Ltd. New Delhi
26. M/s BHEL, OFE & OE Group New Delhi
27. M/s Precision Engg. Co., Mumbai
28. M/s Leader Valves Ltd., Jalandhar
29. M/s Niton Valves Industries (P) Ltd., Mumbai
30. M/s Larsen & Toubro Ltd. (Audco India Limited, Chennai)
31. M/s Aksons & Mechanical Enterprises, Mumbai
32. M/s Petro Valves
33. M/s Datre Corporation Ltd., Calcutta
34. M/s Advance Valves Pvt. Ltd., Noida
35. M/s S.S.Engineering Works
36. M/s AV Valves Ltd., Agra

2) M/s Hawa

Notes:

3) For items listed above, the successful bidders shall supply from the approved makes only.
4) For any other item(s) for which the vendor list is not provided, bidders can supply those item(s) from reputed vendors/ suppliers who have earlier supplied same item(s) for the intended services in earlier projects in GASONET and the item(s) offered is in their regular manufacturing/ supply range is acceptable.

GROUP-D

TECHNICAL SPECIFICATION FOR COMMERCIAL REGULATORS

SCOPE OF WORK/ SUPPLY

Supplier's scope of work shall include Design, detail engineering, manufacturing, assembly, factory testing, inspection (as applicable as per bid document), marking & packaging, supply of Regulators, handling, transportation, loading/ unloading at sites/ designated store, documentation etc. & commissioning spares.

REFERENCE STANDARDS

Unless otherwise specified, the latest edition soft the standards mentioned herein this specification, including all addenda and revisions, shall apply. All pressures mentioned in this specification are gauge pressures. 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 EN 88/ EN 334 standard. Compliance with EN88 standards shall be confirmed by all commercial gas regulators. Leak test for all regulators shall be performed complying to EN 13611.

PERFORMANCE REQUIREMENT AND STANDARD FEATURES

- Satisfactory operation of regulator for the inlet & outlet pressure as specified in the data sheet.
- Inlet/ Outlet connection (to be specified by the vendor) has to be approved by GASONET/its PMC and should be of screwed type as per ISO 7 Part 1: 1994 or any other type of connection (only with prior approval of GASONET/ its PMC).
- Suitable for use with natural gas at nominal specific gravity of 0.65 & operating in ambient temperature of up to 45degC.
- Over Pressure Shut off (OPSO) device to protect against downstream over pressure and creep relief valve to protect against downstream over pressure at low flows or in the event of valve seat malfunction, as indicated in the data sheets.
- Under Pressure Shut off (UPSO) device to protect against downstream under pressure with a pressure setting indicated in the data sheet.
- The regulator shall be also capable of operating either in the vertical or horizontal plane & shall be constructed to be fully resistant to corrosion when installed in outdoor locations in the environment of Rajasthan / Himachal Pradesh / Uttarakhand
- Variant design (if any) offered by the party has to be duly approved by Gasonet/its PMC. For specific requirements, refer to data sheets. GASONET/its PMC shall approve the regulator type & model to be supplied & full technical details shall be supplied along with the technical bid.

MARKING & PACKAGING

The regulator body shall be indelibly and clearly marked with the following details:

- Capacity of the regulator
- Inlet pressure range
- Outlet pressure range
- Regulation accuracy
- Direction of flow

- Name of the manufacturer and the name of the model
- Serial number of the regulator
- Month and year of manufacturing

Each regulator shall be sealed properly before dispatch, such that the factory setting cannot be changed on site. Each regulator (along with the instruction manual) is to be individually packed in a transparent plastic cover (of adequate thickness) to protect the regulator from an increase of dirt and water, and the same shall be packed in an individual box. The description of the contents of each of these boxes shall be clearly mentioned on each of the individual boxes. 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 regulators 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.

QUALITY ASSURANCE

The Supplier will provide details of their quality assurance procedures during the assembly of the units and for final inspection following testing. Gasonet/ its PMC reserves the right to visit the Supplier's facilities without prior notice and inspect test records and witness assembly and testing in progress.

TECHNICAL EVALUATION REQUIREMENTS

- The Supplier is required to submit to Gasonet/ its PMC the details of the regulator to be supplied, including the manufacturing standards, compliance to EN 334/ EN 88 standard (type test certificate), model number, performance curve i.e., outlet pressure v/s flow at different inlet pressures, accuracy specifications, capacity at maximum and minimum inlet pressures, technical catalogues 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.
- Any deviations from the specification should be highlighted and the vendor may also quote advanced/ latest models to reduce overall cost asana ternate.
- The data sheet should be filled up completely and should be enclosed with the Technical Bid.
- Compliance with Technical Specifications will be taken for granted if deviations are not specifically mentioned.
- Quality assurance Plan (QAP) format of the items quoted shall be submitted by the bidder along with technical bids.

INSPECTION PLAN

- Testing & Inspection shall be carried out as per the Technical Specifications of GASONET / its PMC, EN 88/ EN 334 (Commercial regulator) at the works of the manufacturer as per approved QAP.
- Inspection as per approved QAP shall be carried out on each lot by a reputed third-party inspection agency like Lloyds, ABS, SGS, TUV, DNV, BV, EIL, or any other Third-Party Inspection agency with prior approval of GASONET/ its PMC.
- GASONET/ its PMC representative or Third-party inspection agency appointed by GASONET/ its PMC, if any may again carry out inspection during manufacturing/ final inspection at the works of the manufacturer.

- Third Party Inspection shall be included in the quoted prices of all the bidders irrespective of Indian or Indian with foreign manufacturing facility or foreign bidders. Arranging Third Party Internationally Recognized Inspection agencies like Lloyds, ABS, SGS, TUV, DNV, BV, Engineers India Limited, or any other Third-Party Inspection agency with prior approval of GASONET/its PMC, for witnessing inspection and testing at the works of the manufacturer is in the scope of the bidder.
- The vendor shall furnish all the material test certificates, internal test / inspection reports as per the Approved QAP at the time of inspection of each supply lot of material.
- 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 are calibrated.
- All regulators should be wired up and sealed properly by the manufacturer after a final clear inspection and before dispatch. Regulators found in unsealed condition will not be accepted at GASONET stores
- Even after third party inspection, GASONET/its PMC reserves the rights to select a sample of regulators randomly from each manufacturing batch & have these independently tested for compliance with GASONET/its PMC Technical Specifications like dimensional tolerances, leakage testing, performance, accuracy, etc. Should the results of these tests fall outside the limits specified in GASONET/ its PMC technical specification, then GASONET/ its PMC reserves the rights to reject all production supplied from the batch.
- If the performance of any of the sample regulators is not in compliance with the acceptance norms of the respective standards, then that lot of regulators will be rejected.

DATASHEET

Parameter	Requirement
Design	Direct-acting, spring-controlled pressure regulator with an in-built two-stage pressure reducing valve (balance regulating unit). Must include excess pressure slam-shut, insufficient downstream pressure slam-shut, and a creep relief valve.
Installation	Suitable for outdoor installation. Must be tamper-proof and corrosion-resistant for a minimum life of 20 years.
Orientation	Inline Inlet and Outlet
Installation Position	Horizontal / Vertical
Capacity	6 / 10 / 25 / 40 SCMH (Actual)
Inlet Pressure	1 to 6 bar(g)
Outlet Pressure	300 mbar(g) and 500 mbar(g) (Factory Set)
Over Pressure Cut-off	For O/L 300 mbar: 400 mbar(g) and for O/L 500 mbar: 650 mbar(g)
Under Pressure Cut-off	For O/L 300 mbar: 100 mbar(g) and for O/L 500 mbar: 125 mbar(g)
Creep Relief Valve	For O/L 300 mbar: 360 mbar(g) and for O/L 500 mbar: 600 mbar(g) (Vent position not vertically upwards)
Operating Temperature	0°C to 45°C (Design: 60°C)
Body & Casing	Die-cast aluminium / Ductile Iron / Steel (ASTM A216 WCB). Must be weatherproof to IP65 standard.

End Connections	Inlet: 1” NPT (Female loose nut), Outlet: 1.5" NPT (Female loose nut). All fittings, including loose nuts, must be Brass. (Provide suitable brass adaptors if connection sizes differ).
Internals	Stainless steel, Brass, with Nitrile rubber seals.
Filter	Inbuilt filter is essential. If not inbuilt, please quote for a suitable separate filter.
Accuracy Class	AC 5 / RG 5 (as per EN 334 or equivalent)
Closing (Lockup) Pressure	SG 10 (as per EN 334 or equivalent)
Failure Position	Closed
Reset Type	Please confirm if Manual or Auto

Parameter	Requirement
110 Mbar Regulator	
Design	Direct-acting, spring-controlled pressure regulator with an in-built two-stage pressure reducing valve (balance regulating unit). Must include excess pressure slam-shut, insufficient downstream pressure slam-shut, and a creep relief valve.
Installation	Suitable for outdoor installation. Must be tamper-proof and corrosion-resistant for a minimum life of 20 years.
Orientation	Inline Inlet and Outlet
Installation Position	Horizontal / Vertical
Capacity	6 / 10 / 25 / 40 SCMH (Actual)
Inlet Pressure	1 to 6 bars(g)
Outlet Pressure	110 mbar(g) (Factory Set)
Over Pressure Cut-off	(+) 30 % of set Point
Under Pressure Cut-off	(-) 30 % of set Point
Creep Relief Valve	+ 20% of set point
Operating Temperature	0°C to 45°C (Design: 60°C)
Body & Casing	Die-cast aluminium / Ductile Iron / Steel (ASTM A216 WCB). Must be weatherproof to IP65 standard.
End Connections	Inlet: 1” NPT (Female loose nut), Outlet: 1.5" NPT (Female loose nut). All fittings, including loose nuts, must be Brass. (Provide suitable brass adaptors if connection sizes differ).
Internals	Stainless steel, Brass, with Nitrile rubber seals.
Filter	Inbuilt filter is essential. If not inbuilt, please quote for a suitable separate filter.
Accuracy Class	AC 5 / RG 5 (as per EN 334 or equivalent)
Closing (Lockup) Pressure	SG 10 (as per EN 334 or equivalent)
Failure Position	Closed
Reset Type	Please confirm if Manual or Auto

Note:

- The regulator body shall be indelibly and clearly marked with Max. Flow, Inlet & Outlet Pressure Range, Accuracy, Flow Direction, Manufacturer Name & Model, Serial No., Manufacturing Month & Year, etc.
- Successful Vendor shall submit following documents during detail engineering/ supply of material a) Regulator data sheet with make & model number and technical literatures b) GA dimensional drawing with mounting details, model number, part list. c) Performance curve d) Testing and Inspection procedure e) Test, calibration and certificate from statutory bodies. f) Installation, Operation and Maintenance Instruction Manual.
- SS tubing of appropriate size for impulse connection of regulator and slams hut valve to be supplied with suitable connectors wherever applicable.
- End Connections shall be provided by Plastic Caps
- Flow capacity in SCMH shall be calculated considering Maximum Outlet Pressure & Operating Temperature

COMPLIANCE WITH SPECIFICATION

The vendor shall be completely responsible for the design, materials, fabrication, testing, inspection, preparation for shipment and transport of the above equipment strictly in accordance with the Material Requisition and all attachments thereto.

VENDOR'S SCOPE

Vendor scope includes the equipment with all internals and accessories shown on the data sheets, specifications and all unmentioned parts necessary for satisfactory operation and testing except those which are indicated to be out of the Vendor's supply.

INSPECTION Vendor should appoint anyone of the following TPIA for inspection purpose after approval by purchaser:

- Lloyd Register of Industrial Services
- Technische Ulierwachungs Verein (TUV) SUD South Asia
- International Certification Service Pvt. Ltd
- TQ Services
- Moody International (India) Pvt. Ltd
- Bureau Veritas (India) Pvt. Ltd
- SGS
- Quality Services and Solutions Pvt. Ltd.
- Velosi Certification Services
- Certification Engineers International Ltd

Apart from inspection by TPIA, inspection shall also be performed by GASONET delegate, as set out and specified in the codes and particular documents forming this Material Requisition.

APPLICABLE DOCUMENTS General prescriptions, requirements and information are listed in Annexure of this Material Requisition.

VENDOR'S DOCUMENTS: Vendor shall supply the documentation as listed under Documents & Data Requirements of Material Requisition. All documents shall be supplied in English language.
GUARANTEE : Manufacturer shall guarantee that the design, materials, manufacturing and testing of fittings comply with the requirement of this specification and applicable codes and standards. Manufacturers shall replace all fittings which should result defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, substandard material and workmanship. The manufacturer shall guarantee against any defect, failure or malfunctioning occurring during 12 months from the date of commissioning or 24 months from the date of supply whichever is earlier.

WARRANTY : Manufacturer & its authorized distributors should offer a comprehensive Warranty covering the performance of the product against any defects in material or workmanship for the life time of the product. A certificate to this effect must be issued on their respective Company letter head.

SPECIAL CONDITIONS OF CONTRACTS

1.0 GENERAL

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of the Contract. The corresponding clause number of the GCC is indicated in parentheses.

2.0 PRICE BASIS

Price is based on unit rates, which shall remain firm till the execution of the complete order and shall not be subjected to any increase or escalation whatsoever unless otherwise stated specifically in the tender.

Unit Rate is based FOT site basis, including GST and Freight Charges, Packing & Forwarding Charges and Loading and Unloading Charges, Transit Insurance and TPIA Charges.

3.0 TERMS OF PAYMENT

For Supply of MRS and DRS

95 % of supply value as applicable will be paid by the Owner within 30 days against receipt and acceptance of material at site & submission of the following documents: -

- Invoice in triplicate (As per GST Act/ Rules)
- Inspection Certificate cum Release note issued by inspection agency
- GR/ LR
- Packing List
- Insurance cover notes covering transit insurance
- A certificate from manufacturer that all items/ equipment under supply including its component or raw material used with manufacturing are new and conform to the tender requirement. In case manufacturer is not the contractor this certificate will duly be endorsed by the contractor owning overall responsibility.
- Copy of Performance Bank Guarantee(s) of appropriate value (as per order) as already submitted by supplier.
- In case of delay in receipting material at site the invoice value shall be reduced to take care of stipulation of PRS clause of the contract

5% payment within 30 days after completion of successful installation & Commissioning of DRS / MRS.

For Supply of Smart Meters

100 % payment within 30 Days of raising the invoice for the supplied material along with all taxes & charges will be paid on submission of the following documents:

- Covetable Invoice in triplicate.
- Inspection Release note by Owner or his appointed or approved agency / Manufacturer's test certificate.
- GR / LR.
- Packing List.
- Insurance cover notes covering transit insurance.

- A certificate from manufacturer that all items/ equipment under supply including its component or raw material used with manufacturing are new and conform to the tender requirement. In case the manufacturer is not the contractor, the contractor owning overall responsibility will duly endorse this certificate.
- Performance Bank Guarantee(s) of 3% and 5%. If already submitted, a copy of the same.
- Document related to CENVAT credit to be claimed by the Owner, if applicable.
- Letter of undertaking for providing data hosting for a period of 5 years on non-judicial Stamp Paper

For Supply of Commercial Regulators

100 % (Hundred percent) payment of the supplied portion along with freight including taxes & duties will be paid on receipt & acceptance of goods at FOT site after adjustment of PRS, if any along with submission of following documents: -

- Original Invoice in triplicate in compliance with GST law in force
- Inspection Release note by Owner or his appointed or approved agency.
- Original GR / LR
- Packing List
- Insurance cover notes covering transit insurance
- Performance Bank Guarantee(s) of 3% of Contract Value. If already submitted, a copy of the same.
- Document related to Input Tax Credit (ITC) to be claimed by owner, if applicable.

4.0 CONTRACT & DELIVERY PERIOD

Item Description	Completion period
DRS (2500 SCMH, 5000 SCMH)	The contract validity period shall be 12 months from the date of fax of acceptance. As this being a Unit Rate Contract, procurement shall be done on as & when required basis by raising separate Delivery Order (DO) each time. The delivery period for supply of each lot shall be 10 weeks from the date of each Delivery Order (DO).
MRS (G16 TO G250)	The contract validity period shall be 12 months from the date of fax of acceptance. As this being a Unit Rate Contract, procurement shall be done on as & when required basis by raising separate Delivery Order (DO) each time. The delivery period for supply of each lot shall be 08 weeks from the date of each Delivery Order (DO).
SMART METER	The contract validity period shall be 12 months from the date of fax of acceptance. As this being a Unit Rate Contract, procurement shall be done on as & when required basis by raising separate Delivery Order (DO) each time. The delivery period for supply of each lot shall be 14 weeks from the date of each Delivery Order (DO).

Commercial Regulators	The contract validity period shall be 12 months from the date of fax of acceptance. As this being a Unit Rate Contract, procurement shall be done on as & when required basis by raising separate Delivery Order (DO) each time. The delivery period for supply of each lot shall be 08 weeks from the date of each Delivery Order (DO).

5.0 DELIVERY TERMS

Material to be delivered anywhere in
Rajasthan: Bikaner and Churu
Uttarakhand: Pauri Garhwal, Uttarkashi, Rudraprayag, Tehri Garhwal, Pithoragarh, Champawat, Almora, Chamoli and Bageshwar districts
Himachal Pradesh: Mandi, Kullu, Kinnaur and Lahaul & Spiti districts

6.0 CONTRACT CUM PERFORMANCE BANK GUARANTEE

For MRS, DRS and Commercial Regulators

After finalization of the Contract, whenever work order is issued by the Owner, CONTRACTOR shall furnish to the Owner within 30 (Thirty) days from the date of issue of work order, an unconditional Contract Performance Bank Guarantee from a nationalized/ scheduled bank of India or any international bank of repute having a branch in India for due Performance of the Contract for a sum equivalent to 03 % of the Annualized Order Value. This Contract-cum-Performance Bank Guarantee shall be drawn in favor of the Owner and shall be initially valid for a period adequate to cover up to 90 days after end of defect liability period.

In the event, completion of work is delayed/ extended beyond the scheduled completion date for any reason, whatsoever, the CONTRACTOR shall have the validity of the guarantee suitably extended to cover the period mentioned above.

The Owner shall have an unqualified option under this guarantee to invoke the Banker's Guarantee and claim the amount there under in the event of the CONTRACTOR failing to honor any of the commitments entered under this Contract and or in respect of any amount due from the CONTRACTOR to the Owner. In case CONTRACTOR fails to furnish the requisite Bank Guarantee as stipulated above, then the Owner shall have the option to terminate the Notification of Award of Work and forfeit the Bid Security amount and no compensation for the works performed shall be payable upon such termination. Upon completion of the works as per completion schedule stipulated in the Contract, the above said guarantee shall be considered to constitute the Contractor's warranty/ guarantee for the work done by him or for the works supplied and their Performance as per the specifications and any other conditions against this Contract. The warranty/guarantee shall be in force from the date of the issuance of certificate of Completion and Acceptance against this Contract as per GCC.

The CONTRACTOR shall also arrange for the Contact Performance Bank Guarantee to remain valid until the expiration of the guarantee period for the entire work order period.

In the event of the Completion of project being delayed beyond the Scheduled Completion Date, for any reason whatsoever, the Owner may without prejudice to any other right or remedy available to the Owner, operate the Bank Guarantee to recover the Compensation for delay leviable as per

relevant clause of GCC. The Bank Guarantee amount shall thereupon be increased to the original amount, or the CONTRACTOR may alternatively submit a fresh Bank Guarantee for the equivalent amount of compensation for delay recovered.

For Commercial Smart Meters

The bidder shall submit 2 Bank Guarantees (one against supply, installation, and commissioning of meters and one against comprehensive maintenance for 5 years) in our prescribed format, for a value of 3% of the annual contract value for supply, installation, and commissioning of meters, and 5% of the annual contract value against comprehensive maintenance for 5 years in favor of Gasonet, valid for a period of 12 months beyond the contract completion period as security deposit, from a Nationalized/Scheduled bank (excluding Co-operative banks) within 30 days from the date of issue of this work order. The SD will not bear any interest. Any amount due to Gasonet, as per contractual terms and conditions, shall be deducted from the SD. If the SD is not sufficient to recover the outstanding amount, then Gasonet reserves the right to recover the same through any other means available to Gasonet.

7.0 GUARANTEE / WARRANTY

12 months from the date of commissioning or 24 months from the date of dispatch whichever is earlier. Any defects noticed during the guarantee period should be rectified and replaced free of cost. Where the replacement is involved, to and fro fright charges etc. will be your account. The replaced item should have a guarantee of six months from the date of replacement or the remaining period of the main guarantee, whichever it is later. This should be specifically dealt with in your offer.

8.0 PRICE REDUCTION SCHEDULE

In a supply contract, the portion of supply completed in all respects which can be used for commercial operation shall not be considered for applying PRS, if delivered within contractual delivery period. The remaining supplies which are completed beyond contractual delivery shall attract price reduction schedule 1/2 % of the delayed delivery value maximum up-to 5% of the total order value. Price reduction schedule to be applicable against individual release order with specific delivery period and not on the total ARC value.

The value considered for PRS as per the above clause shall be excluding taxes and duties.

9.0 INSURANCE

The responsibility to always maintain adequate insurance coverage during the period of contract till completion of installation, testing and commission including PG Tests shall be that of Supplier in line with the tender documents.
The Transit Insurance shall be arranged by the supplier failing to which the supplier shall be fully responsible for transit damage, if any.

10.0 LIMITATION OF LIABILITY

Notwithstanding anything contrary contained herein, the aggregate total liability of Supplier under the Contract or otherwise shall be limited to 100% of contract value. However, neither party shall be liable to the other party for any indirect and consequential damage, loss of profits or loss of production.

11.0 GOVERNING LAW

Laws of India will govern the Agreement and Mumbai courts will have exclusive jurisdiction on all matters related to Agreement.

12.0 OWNER'S RIGHTS AND REMEDIES

Without prejudice to Owner's right and remedies under Agreement, if SUPPLIER fails to commence delivery as per agreed schedule and/or in reasonable opinion of the OWNER, CONTRACTOR is not in a position to make up the delay to meet the intended purpose, the OWNER may terminate the AGREEMENT in full or part at SUPPLIER's default and may get supplies from other sources at SUPPLIER's risk and cost.

13.0 DELIVERY AND DOCUMENTS

Bidder to note that delivery shall be done at Bikaner, Rajasthan
Upon delivery of the Goods to the transporters/ carriers, the Supplier shall notify the Purchaser/ Consultant and fax/ mail the following documents to the Purchaser/ Consultant:

- LR or GR
- Packing List showing weight and dimension of each package
- Manufacturer's factory inspection complying the technical specification as per tender
- Inspection release note issued by Purchaser/ Consultant/ TPIA
- Cargo Insurance
- Dispatch clearance issued by Purchaser/ Consultant
- Likely date of arrival.
- Invoice

The above documents shall be received by the Purchaser before arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses.

Final original documents for release of payment shall be submitted at GASONET Corporate office and transport copy shall be submitted at the time of delivery at GASONET designated store

14.0 LIABILITY OF TAXES, DUTIES & STATUTORY LEVIES ETC:

The Contractor shall be exclusively liable to pay all taxes, duties, Octroi, royalties, fees, etc, including but not limited to Income Tax, Personal Tax, etc. that may be levied or leviable from time to time on Contractor, its Sub-Contractor and their personnel in respect of the work, services and materials and all contributions, and taxes for unemployment, compensation, insurance and old age pensions or annuities now or hereinafter imposed by any Central or State Government authorities GASONET shall deduct at source any other taxes, levies or duties imposed by Central Govt./ State Govt./ Statutory Authority at the applicable rates - present or future from the sums payable to the Contractor. The rates quoted by the Contractor shall be deemed to be inclusive of all such taxes.

15.0 GOODS & SERVICE TAX:

Goods & Service Tax as applicable, the current rate of Service Tax is 18%. This rate may vary as per Government of India Guidelines published from time-to-time duration the tenure of contract.

Inspection Plan for Smart Meters

Gasonet's Quality Assurance Plan (QAP) for gas meters. In brief, this QAP details the procedures and standards for ensuring the quality of gas meters at different stages, involving both the vendor and a Third-Party Inspection Agency (TPIA).

The plan covers various characteristics of the gas meters, including:

- External leak tightness: Subjected to 100% testing at 1.5 times the maximum pressure.
- Error of indication: Checked at different flow rates (Qmin, Qmax, 0.1Qmax).
- Pressure absorption: Evaluated at the maximum flow rate.
- Dimensional inspection: Verifying critical dimensions like end connection sizes and threading.
- Visual inspection: Checking aspects like the pressure measuring point, meter index reading, powder coating thickness, arrow marking, safety sticker, color, appearance, marking, and packing.
- Fire resistance: Ensuring compliance through review of test certificates.
- Calibration of instruments: Requiring calibration reports for all measuring instruments.
- AMR Compatibility: Testing for compatibility with Automatic Meter Reading systems.
- Optical port: Reviewing test certificates for each lot.

The QAP specifies the quantum of checks, reference documents (primarily EN standards and Gasonet's technical specifications), acceptance norms, format of records, and the scope and remarks for each characteristic. Notably, certain inspections are performed by the vendor and witnessed by the TPIA (5% sample), while others involve only performance and review of documentation. The TPIA also applies its mark on inspected meters and their packaging after verifying the information against Gasonet's technical specifications. Calibration certificates of measuring instruments used are also required to be traceable to national/international standards.

Quality Assurance Plans (QAPs) for Metering Regulating Skids and District Regulating Skids are attached separately.

SECTION – II

BIDDER'S ELIGIBILITY CRITERIA [BEC], METHODOLOGY FOR EVALUATION AND COMPARISON OF BIDS

BIDDER'S ELIGIBILITY CRITERIA [BEC]

Group-A Metering Regulating Skid (MRS)

TECHNICAL BEC

The bidder must have designed, fabricated, integrated, tested, and supplied packaged Meter Regulating Stations (MRS)/ District Regulating Stations (DRS)/ Pressure Regulating Stations (PRS) for Natural Gas services. These supplied stations must be equal to or exceed the specified flow rate, pressure rating, and quantity requirements as detailed in the table below. This experience must have been gained through single or multiple purchase orders within the last five (05) years, counting from the bid due date.

Sr. No.	MRS Description	BEC Qty
1	G16 MRS 150#	3
2	G25 MRS 150#	5
3	G40 MRS 150#	3
4	G65 MRS 150#	7
5	G100 MRS 150#	2
6	G160 MRS 150#	2
7	G250 MRS 150#	1

If a bidder bids for more than one item/Meter Regulating Station (MRS), the bidder shall meet the qualification criteria on a cumulative basis. That is, the total requirement shall be determined by adding the requirements of all respective items.

In support of this, Bidder has to submit a copy of single or multiple Work Order / Purchase Order/ Letter of Award / Letter of Acceptance defining the complete scope of work in accordance with below table (having order date within last 5 years reckoned from the bid due date) along with its proof of execution i.e. Inspection Release Note (IRN) / Dispatch clearance note (DCN) issued by the Consultant/Third party inspection agency (TPIA) or payment advice/certificate along with invoice or Completion certificate / Satisfactory Performance Certificate issued by the Client. The IRN /DCN/ payment advice/certificate along with invoice/ Completion certificate / Letter of Satisfactory performance should have cross reference to the Work Order / Purchase Order/ Letter of Award / Letter of Acceptance. In absence of requisite documents, Gasonet reserves the right to reject the bid without making any reference, whatsoever, to the Bidder.

Note:

1. A Job executed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of the tender. However, jobs executed for Subsidiary/Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice (s) duly certified by Statutory Auditor of the Bidder towards payments of statutory tax in support of the job executed for Subsidiary/Fellow subsidiary/ Holding company. Such Bidders to submit these documents in addition to the documents specified to meet BEC.

FINANCIAL BEC

The minimum annual turnover achieved by the bidder as per their audited financial results during any one of the last three financial years is tabulated as follows.

Sr. No.	MRS Description	Annual turnover	Working Capital	Net Worth
1	G16 MRS 150#	**Rs. 77.88 Lakhs**	**8.00 lakhs**	**Positive**
2	G25 MRS 150#			
3	G40 MRS 150#			
4	G65 MRS 150#			
5	G100 MRS 150#			
6	G160 MRS 150#			
7	G250 MRS 150#			

Note:

In case the tenders having the bid closing date up to 30th September of the relevant financial year and audited financial results of the immediately preceding financial year is not available, in such case the audited financial results of the year immediately prior to that year will be considered as last financial year for Net worth/ Working Capital calculation. Wherever the closing date of the bid is after 30th Sept. of the relevant financial year, Bidder must compulsorily submit the financial results audited for the immediately preceding financial year.

Group-B: Commercial Smart Meters

The Bidder should have directly supplied minimum of below mentioned quantity (as per table) of Commercial Diaphragm gas meter with integrated AMR or Smart Commercial Gas Meter to any City Gas Distribution Entity in India or Europe during last 05 years from the bid due date.

Sr. No.	MRS Description	BEC Qty
1	G4 Diaphragm Meter with AMR or Smart Meter	15
2	G6 Diaphragm Meter with AMR or Smart Meter	20
3	G10 Diaphragm Meter with AMR or Smart Meter	12
4	G16 Diaphragm Meter with AMR or Smart Meter	18
5	G25 Diaphragm Meter with AMR or Smart Meter	30

In case the bidder is a Gas Meter Manufacturer and does not directly qualify for the required criteria, the bidder shall also tie up with an AMR module manufacturer. This AMR module manufacturer must have directly or indirectly supplied AMR modules to an established company in the field of Gas distribution in India or Europe within the last 5 years from the bid due date to fulfill the BEC criteria.

If the bidder is an AMR Manufacturer, they shall also tie up with a Gas Meter manufacturer. This Gas Meter manufacturer must have directly or indirectly supplied commercial Diaphragm Gas meters to an established City Gas Distribution Entity in India within the last 05 years from the bid due date to fulfil the BEC criteria.

If the bidder is a service provider, they must tie up with a Gas Meter manufacturer and an AMR module manufacturer (for utility meters, specifically Gas). The Gas Meter manufacturer must have directly or indirectly supplied commercial Diaphragm Gas meters to an established City Gas Distribution Entity, and the AMR module manufacturer must have directly or indirectly supplied AMR to an established company in the field of water, electricity, or gas distribution in India within the last 05 years from the bid due date to fulfil the BEC criteria.

Note:

A Job executed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of the tender. However, jobs executed for Subsidiary/Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice (s) duly certified by Statutory Auditor of the Bidder towards payments of statutory tax in support of the job executed for Subsidiary/Fellow subsidiary/ Holding company. Such Bidders to submit these documents in addition to the documents specified to meet BEC.

FINANCIAL BEC: NOT APPLICABLE

Group-C District Regulating Skid (DRS)

The bidder must have designed, fabricated, integrated, tested, and supplied packaged District Regulating Stations (DRS)/ Meter Regulating Stations (MRS)/ Pressure Regulating Stations (PRS) for Natural Gas services and specification of the supplied as follows

Sr. No.	DRS Description	BEC Qty	Meter Size Minimum Requirement
1	Metering skids to qualify against clauses shall comprise of Pressure Reduction and Flow Meter. The flow meters shall be as follows. Ultrasonic / Turbine / RPD Metering Skid	01	G400 and above

The Bidder's proposed facility/ workshop for fabrication, assembly and testing of the skids shall be certified by a reputed Inspection agency such as CEIL/ Lloyds/ BV/ DNV/ TUV/ ABS/ Moody/ SGS/ GLI/ Velosi and bidder shall Furnish a certificate from the said agency that the proposed workshop has the Capability for fabrication/ assembly /testing of skids complying the Specifications of the quoted skid / skids.

Note:

A Job executed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of the tender. However, jobs executed for Subsidiary/Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice (s) duly certified by Statutory Auditor of the Bidder towards payments of statutory tax in support of the job executed for Subsidiary/Fellow subsidiary/ Holding company. Such Bidders to submit these documents in addition to the documents specified to meet BEC.

FINANCIAL BEC: NOT APPICABLE

Group-D Commercial Regulator

1. The Bidder must be either a manufacturer of Natural Gas Regulators or an Indian subsidiary/authorized supplier of a foreign manufacturer. If the Bidder is a manufacturer, their proposed manufacturing facility/workshop must be certified by a recognized inspection/testing agency (such as CEIL, Lloyds, BV, DNV, TUV, ABS, Moody, SGS, GLI, Velosi, FCRI, or DVGW, or an equivalent body) for the fabrication, assembly, and testing of the quoted Natural Gas Regulators. If the Bidder is an Indian subsidiary, the manufacturing facility of their foreign manufacturer, from which the Natural Gas Regulator(s) will be supplied, must hold the same certification from one of the reputed inspection/testing agencies for fabrication, assembly, and testing.

2. When a bidder is an authorized supplier of a foreign manufacturer, their offer for Natural Gas Regulators will be considered only if the **manufacturer meets the criteria outlined in Clause 1.0.** The **manufacturer must also take sole responsibility for providing an unconditional guarantee/warranty and after-sales support**, with confirmation of this submitted alongside the bid. Furthermore, the bidder needs to provide an **authority certificate from the manufacturer** validating their status as an authorized supplier, which must remain valid throughout the order's tenure. It's crucial that **each manufacturer quotes through only one supplier, and each supplier offers products from only one manufacturer**. Any change in the proposed manufacturer after the offer's submission will lead to the **rejection of the bid**.

3. The Bidder must have supplied the quantity as indicated below for the type of Natural Gas Regulators under a single order in the last seven years reckoned from the due date of bid opening.

Sr. No.	Description	BEC Qty
1	Natural Gas Regulators of flow capacity 6 SCMH & above, with outlet pressure of 300 mbar to 500 mbar (g), inlet pressure upto 6 bar.	10
2	Natural Gas Regulators of flow capacity 6 SCMH & above, with outlet pressure of 110 mbar (g), inlet pressure upto 6 bar.	05
3	Natural Gas Regulators of flow capacity 10 SCMH & above, with outlet pressure of 300 mbar to 500 mbar (g), inlet pressure upto 6 bar.	10
4	Natural Gas Regulators of flow capacity 10 SCMH & above, with outlet pressure of 100 mbar (g), inlet pressure upto 6 bar.	10
5	Natural Gas Regulators of flow capacity 25 SCMH & above, with outlet pressure of 300 mbar to 500 mbar (g), inlet pressure upto 6 bar.	10
6	Natural Gas Regulators of flow capacity 25 SCMH & above, with outlet pressure of 110 mbar (g), inlet pressure upto 6 bar.	20
7	Natural Gas Regulators of flow capacity 40 SCMH & above, with outlet pressure of 300 mbar to 500 mbar (g), inlet pressure upto 6 bar.	10
8	Natural Gas Regulators of flow capacity 40 SCMH & above, with outlet pressure of 110 mbar (g), inlet pressure upto 6 bar.	20

Furthermore, if a bidder holds a running rate contract and has fulfilled a quantity equal to or exceeding the minimum prescribed in the Bid Evaluation Criteria (BEC) by the day before

submission, this experience will be considered, provided a satisfactory supply execution certificate from the end-user/owner is submitted.

Note:

A Job executed by a Bidder for its own plant/ project cannot be considered as experience for the purpose of meeting BEC of the tender. However, jobs executed for Subsidiary/Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice (s) duly certified by Statutory Auditor of the Bidder towards payments of statutory tax in support of the job executed for Subsidiary/Fellow subsidiary/ Holding company. Such Bidders to submit these documents in addition to the documents specified to meet BEC.

FINANCIAL BEC: NOT APPICABLE

METHODOLOGY FOR EVALUATION OF PRICE BIDS FOR METERING REGULATING SKID (MRS) AND DISTRICT REGULATING SKID (DRS)

Prices will be opened only for the techno-commercially acceptable bidders whose bids have been found to be substantially responsive. The evaluated price of bidders shall include the following:

i) Ex-works price quoted by the bidder (including packing and forwarding but excluding Inland Transportation to the Delivery Location).
ii) (+) GST (CGST & SGST/UTGST or IGST) on the finished goods, including inland transportation (i.e., on points i and ii above).
iii) Other loading charges, if any, as specified in the Tender Document.

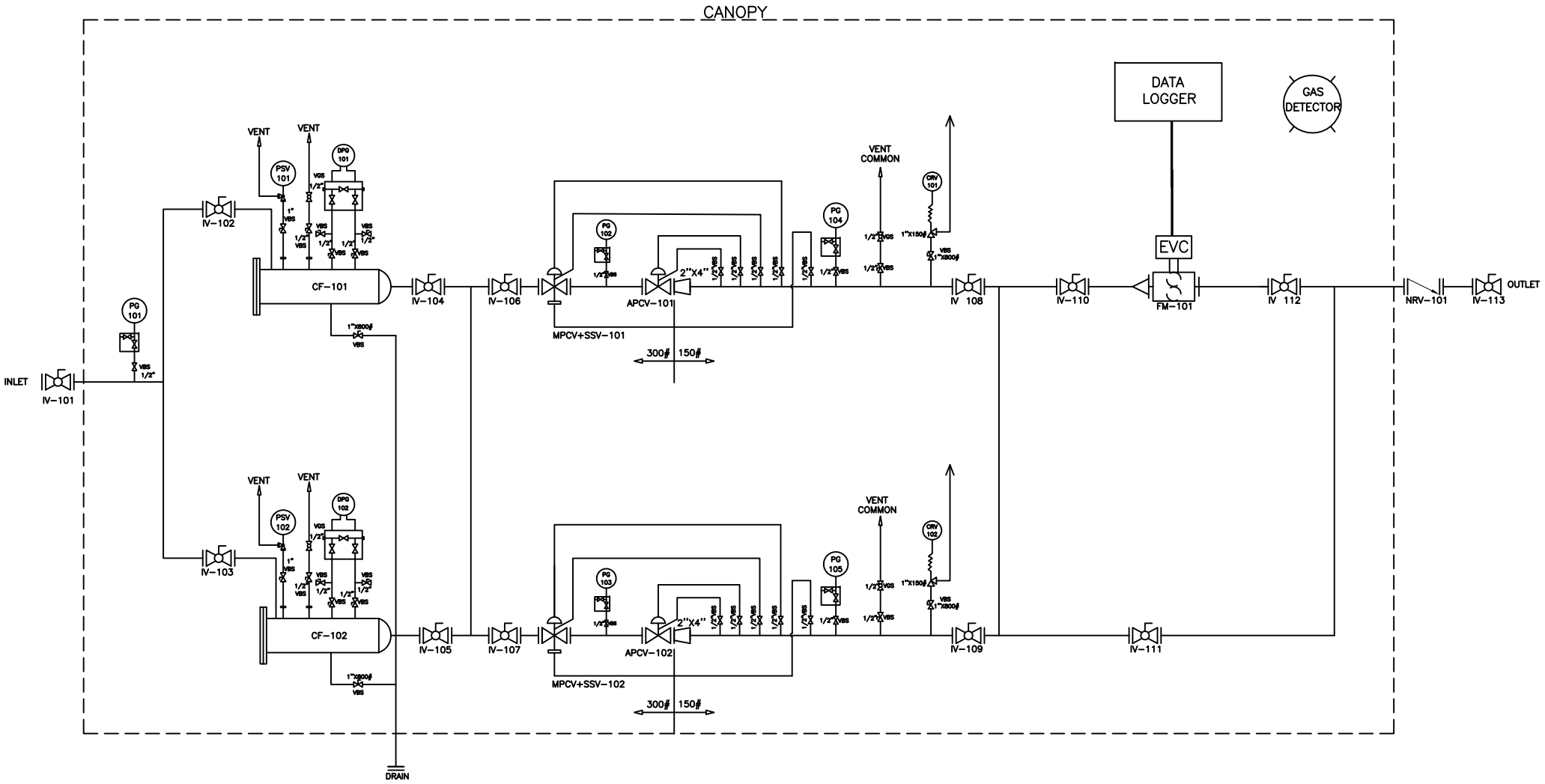
- Evaluation will be done item-wise on an L-1 basis, meaning it will be based on the prices quoted against each item separately as per the Schedules of Rates (SOR).
- A bidder may quote for all or any item(s) of the Price Schedule (SoR). Evaluation and ordering shall be done on a "least cost basis to Gasonet" for each item on an L1 basis.
- Bidders quoting for any item must quote for the entire quantity of that item; otherwise, their bid will be considered incomplete and will not be evaluated.
- In case of a tie between bidders, the Purchase Order (PO) shall be awarded to the bidder having the higher turnover in the financial year 2023-24.

METHODOLOGY FOR EVALUATION OF COMMERCIAL SMART METER AND COMMERCIAL REGULATORS

The Contract shall be awarded to the overall L1 bidder. However, depending upon the performance, execution capability, and financial strength of the eligible bidder, Gasonet reserves the right to award the order to more than one bidder at its sole discretion to ensure smooth operation. The bidder is required to quote for all the SORs. In case of a tie between bidders, the Purchase Order (PO) shall be awarded to the bidder having the higher turnover in the financial year 2023-24.

Bidder shall submit the audited Balance Sheet for the Financial Year 2023-24.

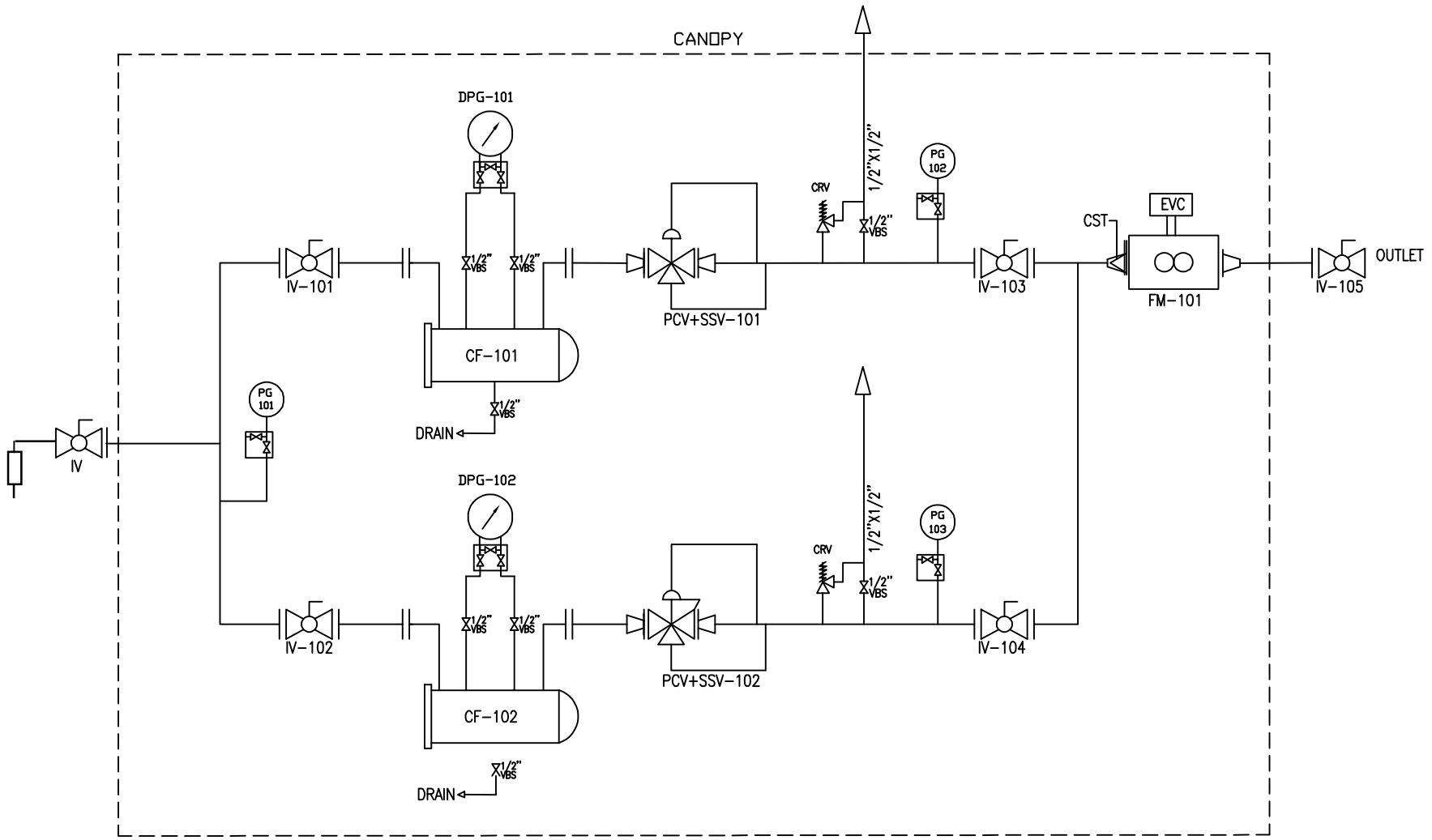
DATASHEETS,
PIPING AND INSTRUMENTATION DIAGRAM
&
QUALITY ASSURANCE PLAN



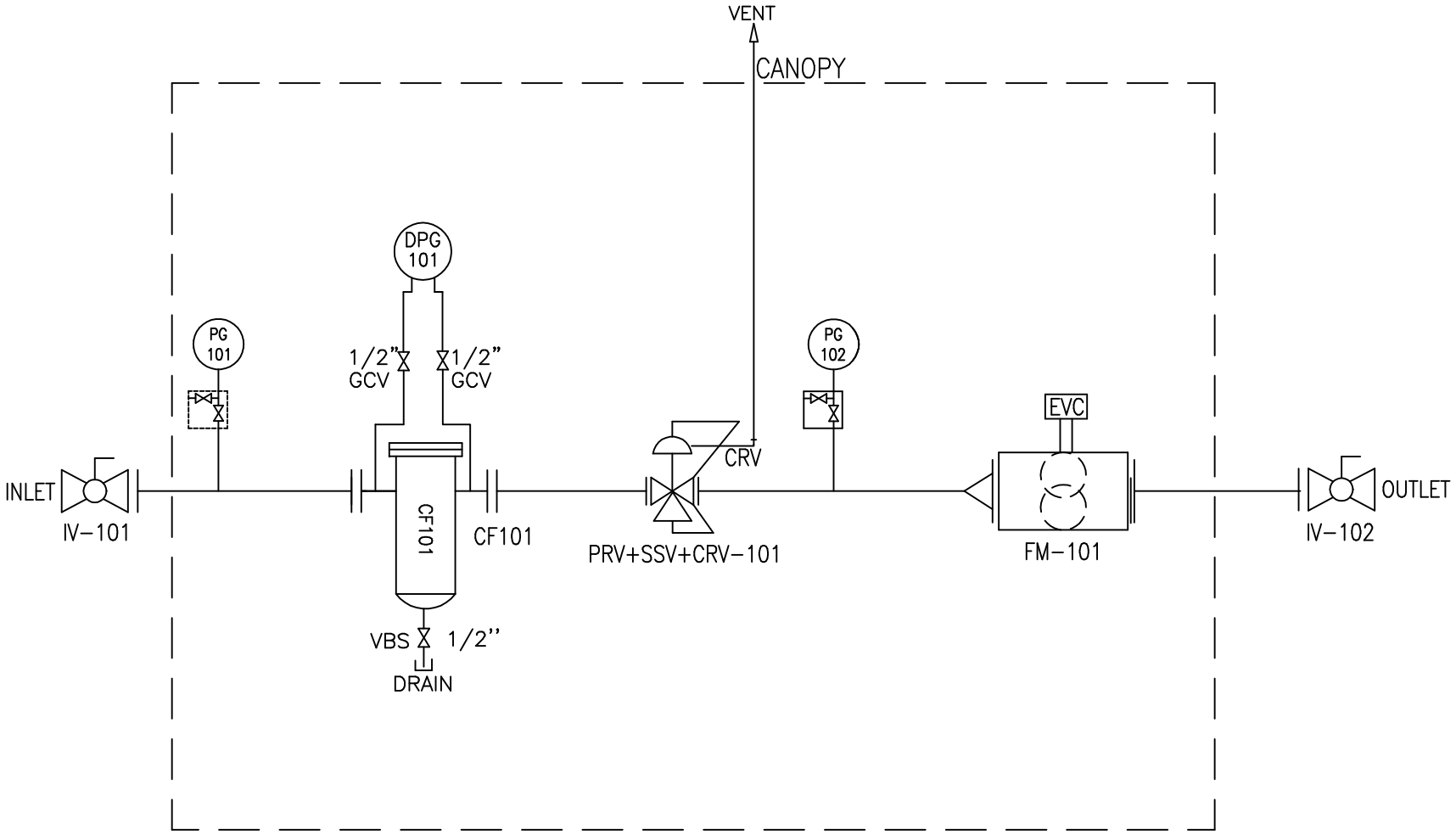
PROCESS DATA

SERVICE	: NATURAL GAS
INLET PRESSURE OF SKID	:
OUTLET PRESSURE OF SKID	:
FLOW RATE	: 2000 SCMH 5000 SCMH
INLET TEMPERATURE	: 15 ℃ TO 40 ℃

NOTE:- P&ID SHOWN IS TENTATIVE.HOWEVER, BIDDER HAS TO DO THE SIZING & ENSURE ENGINEERING AS PER PNGRB T4S GUIDELINES.


CANOPY
DPG-101
DPG-102
PG 101
PG 102
PG 103
CRV
1/2"X1/2"
1/2" VBS
IV
IV-101
IV-102
IV-103
IV-104
IV-105
CF-101
CF-102
PCV+SSV-101
PCV+SSV-102
CST
EVC
FM-101
OUTLET
DRAIN

Gasonet


VENT
CANOPY
DPG
101
PG
101
1/2"
GCV
1/2"
GCV
PG
102
EVC
CRV
INLET
IV-101
CF101
CF101
PRV+SSV+CRV-101
FM-101
OUTLET
IV-102
VBS
1/2"
DRAIN

QUALITY ASSURANCE PLAN

Sr No.	Description	Type of Examination	Extent of check	Acceptance Norm	Types of Record.	Inspection by QC Dept.			Remark.
						M	C	CI/TPI	
A	**IN WARD MATERIAL IDENTIFICATION.**								
1	Pipe,Fitting,Flanges,Fasteners & Gasket	Material composition &Mechanical properties.	100%	As Techanical spec./ASME SEC-II PART-A	Manufacture test Certificate/Lab Report	P	R	R	
	Valve & instruments.								
2	Isolation Valves,	Chemical Analysis Physical Analysis Body Hydro Test Seat Hydro Test Seat Air Test	100%	Approved Data sheet. If required. As per Std.	Manufacture test Certificate /Lab Report.	P	R	R	
3	PCV+SSV & CRV	Hydro Test & Pneumatic Leak Test	100%	Approved Data sheet. If required.	Manufacture compliance Certificate	P	R	R	
4	Pr. Gauges,Diff Pr. Gauges.	Calibration Range,	100%	Approved Data sheet. If required.	Manufacture test Certificate/Lab Report	P	P	R	
B	**IN PROCESS INSPECTION.**								
	Welding ,NDT.Pressure Test,cleaning & Painting.								
1	Welder Qualification.	WPS,PQR	100%	As perASME SEC-IX	Test procedure record.	-	P	R	
2	Radiographic Test.	RT Test of Butt weld joint (Excluding vent & drain)	10%	As perASME SEC-V	Test Report /Review Of Report	-	P	R	
3	Hydro Test Pressure	Visual	100%	For 150# Test Pr.28.5 kg/cm2 & 73.5 kg/cm2 for 300# . Duration is 60 min.	Internal inspection Report.	-	P	R	
C	**FINAL INSP. OF SKID ASSEMBLY.**								
1	Final Inspection& Visual Inspection of skid	Visual workmanship & completeness of assembly	External Parts only	As per G.A Drawing & P & ID & FAT	Internal inspection Report.	-	P/W	R	
2	Dimension	Complete skid.(LXBXH OF FRAME)	100%	As per Drawing.Open tolerance +/- 10 mm	Internal inspection Report.	-	P	R	
3	Pneumatic Leak Test	Pressure 7 kg/cm2 for 30 min	100%	As per G.A Drawing & P & ID & FAT	Internal inspection Report.	-	P/W	W/R	
4	Performance Test	Set point Test	100%	As per G.A Drawing &P & ID & FAT	Internal inspection Report.	-	P/W	W/R	

Legends:-
M-Manufactuar,**C -** Contractor
CI/TPI-Client / Third Party Inspection Agency.
P-Performer.**V**-Verification.
R-Review Of Document.**W**-Witness

REVIEWED & APPROVED BY

Gasnet