GUJARAT GAS

TECHNICAL SCOPE FOR FABRICATION AND SUPPLY OF INDUSTRIAL METERING SKID

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1. OVERVIEW

Gujarat Gas Limited, hereinafter referred to as GGL, is a Group Company of Gujarat State Petroleum Corporation Ltd., (Government of Gujarat undertaking) supplies natural gas to automobile, industrial, commercial and domestic consumers including CNG stations in various Geographical Areas as per authorisation from Petroleum and Natural Gas Regulatory Board (PNGRB). GGL procures Industrial Metering Skid (IMS) and installs it for supplying natural gas to Industrial customers.

This specification is intended to establish the minimum technical requirements to fabricate and supply Industrial Metering Skid (IMS) for the pressure class ANSI 150 and ANSI 300.

The scope of document includes design, material selection, manufacture, supply, inspection, testing, marking, packaging, handling, despatch of IMS.

2. DEFINITIONS

In the Bid / Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires.

a. The **"GGL"** or **"Company"** or **"Owner"** shall mean GUJARAT GAS LIMITED (GGL), incorporated under company's Act 1956 having its registered office at Gujarat Gas CNG Station, Sector 5/C, ,Gandhinagar – 382006,Gujarat, hereinafter mentioned as "OWNER" which expression shall, unless repugnant to the context or meaning or meaning thereof, include all its successors, administrators, executors and assigns.

b. The **"Bid"** shall mean the Bid submitted by the CONTRACTOR for acceptance by the GGL. The **"Contract"** shall mean the agreement and all other documents between the company and the contractor for providing the services mentioned herein.

c. The **"Vendor"** shall mean the person or persons, firm or Company whose Bid has been accepted by GGL

d. The **"Supervisor" OR " work in charge"** shall mean the person deployed by the contractor for control & supervision of the work of his work force, as per the Scope of work mentioned and to receive instructions from OWNER's Engineer-In-Charge or his representative.

e. The **"GGL Engineer-In-Charge"** or" **GGL's representative"** shall mean the person designated as such by the Gujarat Gas Limited and shall include his authorized nominee or agent, provided however that the GGL's Representative to be so designated by GGL may be one person for certain aspects of this agreement and another person for other aspects of work covered by this Bid / Contract.

f. **"Stores"** shall mean the Companies Stores located at various location of Gujarat.

g. The **"Specification"** shall mean all directions, the various technical specifications, provisions attached and referred to in the Bid documents which pertain to the method and manner of performing the work or works to the quantities and qualities of the work or works and the materials to be furnished under the contract or works or works as may be amplified or modified by the COMPANY during the performance of Contract in order to provide the unforeseen conditions or in the best interests of the work or works. It shall also include the latest edition of relevant standard specifications including all addenda / corrigenda published before entering into the contract.

h. **"Guarantee"** shall mean the period and other conditions governing the warranty / guarantee in respect of the work as detailed in section hereunder.

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i. **"HSE"** shall mean Health, Safety & Environment.

j. **"GGL's Premises"** or **"Owner's Premises"** shall mean company's premise or its customer's premises where work is to be executed.

k. **"OEM"** shall mean Original Equipment Manufacturer

l. **"EIC"** shall mean Engineer In –Charge

3. REFERENCE CODES AND STANDARDS

Unless otherwise specified in this document or elsewhere in tender, the vendor shall take reference of latest version of following codes and standards.

PNGRB CGD Standard	:	GSR 612(E) Technical standard and specifications including safety standards for CGD networks (T4S-CGD)
PNGRB Pipeline Standard	:	Technical standard and specifications for Natural Gas Pipelines (T4S-Pipeline)
ASME B 31.8	:	Gas Transmission & Distribution piping systems
IGE/TD/13	:	Pressure regulating installations for Natural Gas, Liquefied Petroleum Gas and Liquefied Petroleum Gas/Air
EN 14382	:	Safety devices for gas pressure regulating stations and installations – Gas safety shut-off devices for inlet pressures up to 100 bar
EN 334	:	Gas pressure regulators for inlet pressures up to 100 bar
API 526	:	Flanged Steel Pressure Relief Valves
API 527	:	Seat Tightness of Pressure Relief Valves
API 520	:	Sizing, Selection, and Installation of Pressure-relieving Devices
ASME Sec VIII Division I	:	Boiler and Pressure Vessel Code: Rules for Construction of Power Boilers
ASME Sec IX	:	Boiler and Pressure Vessel Code: Qualification Standard for Welding, Brazing and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators
ASME Sec V	:	Boiler and Pressure Vessel Code: Non-destructive Examination

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4. DESIGN PROCESS PARAMETERS FOR IMS

Design and process parameters shall be considered as per the enclosed Annexure-27

5. PROCESS ENGINEERING FOR IMS

The Industrial metering skid (IMS) consists of following and as per the enclosed P& IDs.

5.1 VENDOR SCOPE OF SUPPLY

Below materials are in vendor scope and same shall be supplied as per GGL approved datasheet, GGL Piping material specification and from GGL approved vendor-

- Ball Valves
- Cartridge filters with differential pressure gauges along with all necessary mountings & Accessories incl. vent & drain pipe with root valves.
- Pressure Gauge.
- Swing or Wafer Type Check Valve
- Base frame with FRP canopy as per purchase order.
- PE to Steel Transition Fitting
- Y-type strainer
- Fasteners and Gaskets for Meter
- Foundation Bolt
- Spectacle blind
- Conical SS Strainer

5.2 GGL SCOPE OF SUPPLY

- RPD Meter / Turbine Meter with junction box mounting pole

Note:-

- Inlet and outlet line sizes of IMS are sized considering Design Velocity mentioned in Annexure-27

SKID PROCESS:

- The skid can be basically considered to be in 2 sections:
  1. **Gas Filtration**: The system is having cartridge filter arrangement for single-stage filtration. The cartridge filter is designed/ provided with polyethylene/polypropylene/synthetic fibre elements for fine filtration up to 5µ with 99% efficiency

  2. **Metering:** Gas flow measurement equipment is not part of this specification.

     Flow Computation is carried out using RPD or turbine meter as per GGL requirement. Supply of meter is under scope of Gujarat Gas. Installation of meter is under scope of VENDOR.

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6. VENDORS SCOPE OF WORK:

- The VENDOR shall be responsible for material selection, design, engineering, fabrication, FAT (Factory Acceptance Test), supply including loading and unloading at site, arrangement of N2 cylinder at site for SAT (Site Acceptance Test), commissioning, supply of documentation of Skids comprising of complete assembly, NDT report, excluding supply of RPD Meter with accessories shall be free issue material by GGL for natural gas supply to industrial consumers.
- VENDOR at no additional cost to GGL shall arrange the class room as well as field training for GGL O&M personnel.
- Vendor shall supply Industrial metering skid along with Meter.
- VENDOR shall be responsible for installation of meter at no additional cost.

- GGL will free issue meter for Industrial Metering skid from GGL store. VENDOR shall be responsible for collecting the meter from GGL store. Transportation of meter from GGL store to VENDOR workshop is under the scope of VENDOR. No additional charges will be paid by GGL for transportation of meter and installation of meter.
- VENDOR shall be sole responsible for the material selection, design, engineering, and supply to the designated delivery point and performance testing of IMS as per the data sheet and specification furnished and taking into consideration successful operation, safety as per the established international standards.
- VENDOR shall perform all the tests as per the GGL approved QAP.
- VENDOR shall perform Non-destructive tests as per ASME section V, ASME B 31.3 & GGL approved QAP.
- VENDOR shall submit specifications for general items like U clamp sleeve(PVC coated), tag plate (aluminum material), insulation padding (HDPE sheet), canopy window glass(toughened glass with protection as per IP 50), sealant jelly , clamp diameter, separate earthing clits for both instrument and skid piping, etc. for GGL approval at the time of bidding.
- VENDOR shall be responsible for replacement/repairing of skids if any part of skid are found damaged during unloading at site or store with no cost to GGL.
- VENDOR shall provide all 'test certificate and inspection reports of supplied materials.
- VENDOR shall design a skid in such a way that all equipment's & valves of the assembly shall be easily accessible for O&M.
- Functional testing of the skid shall be carried out as per the GGL approved functional testing procedure.
- VENDOR shall arrange the N2 gas cylinder for SAT and commissioning of Pressure Regulating Skid at site in line with Gujarat Gas Limited approved Procedure.
- Site acceptance test (SAT) shall be carried out by the Vendor post completion of the fabrication work at site by GGL pipeline laying contractor.
- VENDOR shall supply the necessary repair kit and consumables required as part of commissioning process with no cost to GGL.
- Any soft material used shall be able to retain its functional properties for minimum period of 18 months from the date of dispatch.
- VENDOR shall adopt standard operating procedures for fabrication of skids.
- VENDOR shall provide proper packaging of all equipment, piping, appurtenances and styrene packing to safeguard all components of the skid during transportation.
- VENDOR shall furnish the details of foundation and Grouting pockets requirement. Supply of foundation bolts of adequate strength is in the scope of the VENDOR.
- VENDOR shall quote rates for supply of skids in line with given SOR.

7. SPECIAL NOTES

- Isolation valves for PG shall be ½" Ball Valve (NPT).

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- Isolation valve (as root valve) is required for DPG.
- Insulating Pad to be provided between Filter leg/skirt and base frame.
- Supply of foundation bolts is under Bidder's Scope. Supplier to provide Foundation Bolt Hole size and location details.
- A laminated copy of approved P&ID shall be displayed on the inside of the shelter.
- Lifting lugs shall be provided properly as per Centre of gravity of the skid. Lifting Procedure to be recommended by the Vendor and approved by GGL prior to dispatch.
- All impulse tubing shall be of Material SS 316.
- For equipment not manufactured by the Bidder, OEM accredited Certification is required for consent on service, supports, spare & maintenance.
- Filter nozzle below 2" for DP Gauge shall be SW. Threaded nozzle shall not be provided.
- Pressure gauge shall be provided without manifold.
- Sound pressure levels shall be limited to the values prescribed by Environmental Authorities but in no case it shall exceed 110 dbA as per PNGRB T4S standard for CGD. VENDER shall provide noise suppression treatment to limit the noise level.
- Vendor shall provide 02 No's earthing provision diagonally opposite (Earthing boss of material SS304) at Base frame of the skid.
- Platform along with handrails shall be provided with skid in case of vertical filters and any other equipment's having height more than 2 mtrs.
- 1" Drain assembly for filters to be supplied in all sizes of IMS. Drain pipe shall extended till the inner wall of the canopy. One additional spool comprising of two flanges in loose shall be provided along with the skid to extend the drain outside the canopy.
- Factory Acceptance Test (FAT) for the Skid shall be witnessed by TPIA.
- Supply of Bolt for meters is in Vendor scope
- Vertically orientation of filters is preferred. VENDOR shall provide companion flanges with skid at outlet side and TF at inlet side. Spectacle blind to be provided in the downstream of the inlet valve.
- The general arrangement of the skid shall be of compact design.
- The canopy shall be designed in such a way that it shall accommodate the metering block and shall have ease for O&M activities.
- All piping, pipe fittings & fasteners to be used are hot dip galvanized.
- Foundation drawing shall be submitted with following details-
  a) Boughtout item Weight
  b) Base frame weight
  c) Equipment, Pipe & Fitting weight
  d) Canopy weight
  e) Empty weight
  f) Hydrotest weight
  g) Total weight of skid without canopy

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- Size of the base-frame and Canopy shall be as per the enclosed Annexure. Base frame and Support shall be provided as per the enclosed Annexure. However, vendor shall carry out stress analysis before submitting the drawing to GGL for approval.

  Base frame drawing shall be submitted with minimum following details-

  a) Base frame plan with location of Support, Earthing Bose, Lifting Lug plate, Support base plate, foundation base plate etc.
  b) Support drawing for each type of support
  c) Lifting lug drawing
  d) Earthing Bose
  e) Foundation base plate
  f) Support base plate

- Vender shall provide Copper jumper plate at all flange joints of the skid as per the dimensions given below-

Nominal Pipe Size (mm/Inch)	150 Class Flange			300 Class Flange		
	Copper plate length (mm)	Copper Strip Width (mm)	Copper Strip Thickness (mm)	Copper Strip length (mm)	Copper Strip Width (mm)	Copper Strip Thickness (mm)
15 (1/2")	115	25	3	125	25	3
20 (3/4")	120	25	3	145	25	3
25 (1")	120	25	3	145	25	3
40 (1 ½")	125	25	3	165	25	3
50 (2")	135	40	3	170	40	3
80 (3")	155	40	3	180	40	3
100 (4")	155	40	3	195	40	3
150 (6")	160	40	3	215	40	3
200 (8")	175	40	3	235	40	3
250 (10")	180	40	3	250	40	3
300 (12")	185	40	3	270	40	3

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8. QUALITY ASSURANCE

The Vendor shall submit below tabulated documents after getting firm order from Owner for review and approval as per the requirement mentioned in the table. VENDOR shall be responsible for the submitting all drawing and technical documents including QAP to Gujarat Gas Limited for approval **within 15 days after placement of order**.

S. No.	Document	Requirement
Engineering		
1	P& I Diagram	GGL Approval
2	GA Drawing	GGL Approval
3	Isometric drawing	GGL Approval
4	Skid Sizing Calculation Sheet for Inlet, Intermediate & Outlet, DP across the skid as well as major centre	GGL Approval
5	Bill of Material	GGL Approval
6	Specifications for general items like U clamp sleeve, tagging, insulation padding, canopy window glass, sealant jelly, clamp diameter, separate earthing clits for both instrument and skid piping, etc.	GGL Approval
7	WPS/PQR	TPI Approval
8	Operation Philosophy	Information
9	Operation, Installation & Maintenance Manual	Information
Quality		
1	Quality Assurance Plan	GGL Approval
2	Factory Acceptance Test Procedure	GGL Approval
3	Functional Test Procedure	GGL Approval
4	Site Acceptance Test Procedure	GGL Approval
5	Hydrostatic test Procedure	GGL Approval
6	Hydrostatic test report	TPI approval
7	Non Destructive examination	TPI Approval
Valves & Equipment's		
1	Filter datasheet	GGL Approval
2	Filter drawing	TPI Approval
3	Design of filter vessels consisting sizing calculation, weld schedule, GAD, support details, QAP, Selection of cartridge etc.	TPI Approval
4	Detailed Cross Section Drawing for equipment's like valves, regulators, slam shut, relief valve, check valve etc.	GGL Approval
5	Filter cartridge selection	GGL Approval
Civil & Structural		
1	Detail of Base Frame with supports including size	GGL Approval
2	Civil Foundation drawing	GGL Approval
3	Tubing support drawing	Information
4	Name Plate	GGL Approval
5	Canopy Drawing & Specification	GGL Approval

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- Prior to dispatching of materials, Vendor shall offer material to GGL/GGL representative for final acceptance test as per GGL approved QAP at their premise following for review of GGL/GGL representative at the time of final inspection at Vendor premise prior to dispatch of materials.
- The vendor is entirely responsible for the quality of the skid manufactured by them.
- VENDOR shall provide all testing report as mentioned in Quality Assurance Plan (QAP) for review during FAT. Also all tests to be certified out during FAT shall be witnessed by GGL/GGL representative.
- VENDOR shall provide WPS & PQR before commencement of fabrication job for approval.
- VENDOR shall procure bought out items from approved Vendors with Gujarat Gas Limited.
- **Third Party Inspection (TPA)** for Filter document approval is in vendor scope.
- **Third Party Inspection (TPA)** for in-process and final Inspection upto dispatch clearance of DRS/CPRS as per GGL approved QAP and Technical Specification is in GGL scope. For any control test or examination required under the supervision of GGL/GGL representative, Vendor shall inform in writing 10 GGL working days in advance about inspection date & place along with production schedule.

9. DOCUMENT HAND OVER

MANUFACTURER shall also submit the *1 sets hard copies and one (1) digital copy on Compact Disc* of following documents along with shipment of skid and *one (1) digital copy to GGL head office along with Summary Report and IRN hard copy*

- Approved Bill Of Material;
- Approved P&I Diagram;
- Approved Plan & Isometric Drawing;
- Approved Cross Section Drawing;
- Approved Quality Assurance Plan;
- Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items in nicely bound volumes.
- Traceability Records (including welding rods);
- Statutory test certificates, as applicable.
- WPS, PQT & WQT records wetted by TPIA;
- Dimensional Check Report;
- Non Destructive Test Report: RT, UT & MPT
- Pressure Testing Certificate: Hydrostatic & Pneumatic Test;
- Performance / Functional test Certificate;
- Painting Specification and Report;
- Inspection & test reports for all mandatory tests duly certified by Gujarat Gas Limited authorized TPI/representative after review/witness as per the applicable code as well as test reports for any supplementary tests, in nicely bound volumes.

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- VENDOR shall provide Purchase orders of bought out items along with all TCs.
- Mechanical Gauge / Instrument Calibration Certificates;
- Warranty Certificate;
- FAT Report;
- TPI approved Inspection release Note;
- Equipment Design, sizing & Calculation Documents;
- System Pressure Drop;
- Valve Documentation;
- Filter Cartridge Details & specification;
- Equipment & Instrument Data Sheets;
- Hook up Details;
- Operation and maintenance instruction manual & requirements;
- Typical Noise Assessment & Control Report;
- Typical Hazardous Area Classification;
- Original Equipment / instrument catalogs;
- Un-priced Purchase order of all the bought out items;
- Compliance certificate in line with GGL Bid;
- Other information which MANUFACTURER seems necessary.
- Consolidate Exception / Deviation Report;
- FAT Procedure;
- Start-up and Commissioning Procedure;
- Summary report which includes all the test as per QAP, TC/Report number, Observed values of tests

10. WARRANTY PERIOD

- WARRANTY periods are defined as 12 Months from the date of commissioning of IMS (or) 18 months from the date of delivery of IMS.

Note:

- No additional charge will be paid during warranty period for supply and replacement of any item in the skid.

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11. ANNEXURES

ANNEXURE-01 TYPICAL PIPING & INSTRUMENTATION DIAGRAM (P&ID)
ANNEXURE-02 TYPICAL GENERAL ARRANGEMENT DRAWING (GAD)
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