# BHAGYANAGAR GAS LIMITED

(A JOINT VENTURE OF HPCL & GAIL)

## BID DOCUMENT FOR

**Procurement of 400 SCMH CNG Booster Compressor packages- 06 no's for City Gas Distribution project at Hyderabad, Vijayawada and Kakinada GA's**

## UNDER OPEN DOMESTIC COMPETITIVE BIDDING

## Bid Document No.: BGL/628/2024-25

## VOLUME-II of II

**DEFINITION**

Where used in this document, the following terms shall have the meanings indicated below, unless clearlyindicated by the context to this order.

**PROJECT:** City Gas Distribution Project of HYDERABAD, VIJAYAWADA and Kakinada GA

**OWNER/COMPANY/PURCHASER/CLIENT:** BHAGYANAGAR GAS LIMITED (BGL)

**VENDOR/BIDDER/SUPPLIER/CONTRACTOR:** The party, who manufactures and supplies equipment andProvide services to the OWNER or to CONTRACTOR

**MR:** Material Requisition.

## Section I: MATERIAL REQUISITION

### 1.0. SCOPE OF SUPPLY & SERVICES

Design, Engineering, Manufacturing, Testing, Inspection, Supply, Transportation, Transit Insurance, Loading & Unloading at HYDERABAD AND VIJAYAWADA GA (BGL) site/store, Documentation including Erection, Installation, Commissioning with commissioning spares & Field Performance Test at BGL site of 400 SCMH Electric Motor Driven Hydraulic Variable Suction CNG Booster Compressor with air compressorof capacity approx. 1.5KW discharge pressure approx. 10Kg/Cm2g, 100 water liter capacity air receiver and air dryer along with all accessories and auxiliaries as per technical volume of tender document complete in all respects including special tools & tackles with the list & Comprehensive maintenance services for 05 (five) years including warrantee period as per details furnished in this Bid documents.

| SOR Item No. | Description of item | Unit | Quantity |
|---|---|---|---|
| **Part A: Hyderabad & Vijayawada GA** | | | |
| A1 | Design, Engineering, Manufacturing, Testing, Inspection, Supply, Transportation, Transit Insurance, Loading & Unloading , at BGL Authoroized site/store, Documentation including Erection, Installation, Commissioning with commissioning spares & Field Performance Test at BGL site of 400SCMH Electric Motor Driven Hydraulic Variable Suction CNG Booster Compressor ( PLC based), IOT compatible) with air compressor of capacity approx. 1.5KW discharge pressure approx. 10Kg/Cm2g, 100 water liter capacity air receiver and air dryer along with all accessories and auxiliaries as per technical volume of tender document complete in all respects including special tools & tackles with the list . | Nos | 05 |
| A2 | Lump sum Repair & Comprehensive Maintenance charges (excluding the scope covers under warrantee) per Compressor Package including air compressor for 1st year during warrantee period in all Geographical Areas of BGL inclusive of all manpower, spare parts, lubricants and consumables, etc. including the Preventive Maintenance at regular interval by as per recommendation of OEM, | Machine Months | 60 |

| | | | |
|---|---|---|---|
| | Breakdown Maintenance as and when required for (5 packages X 12 Months) The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.40% (maximum 1.5%) of unit price (sl.no 1) quoted by the bidder. | | |
| A3 | a. For 2nd Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.50% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder . | Machine Months | 60 |
| A4 | a. For 3rd year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.55% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 |
| A5 | a. For 4th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.61% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 |
| A6 | a. For 5th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.67% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 |
| **Part B: Vijayawada / Kakinada GA** | | | |
| B1 | Design, Engineering, Manufacturing, Testing, Inspection, Supply, Transportation, Transit Insurance, Loading & Unloading at BGL Authoroized site/store, Documentation including Erection, Installation, Commissioning with commissioning spares & Field Performance Test at BGL site of 400SCMH Electric Motor Driven Hydraulic Variable Suction CNG Booster Compressor ( PLC based, IOT compatible) with air compressor of capacity approx. 1.5KW discharge pressure approx. 10Kg/Cm2g, 100 water liter capacity air receiver and air dryer along with all accessories and auxiliaries as per technical volume of tender document complete in all respects including special tools & tackles with the list . | Nos | 01 |
| B2 | a) Lump sum Repair & Comprehensive Maintenance charges (excluding the scope covers under warrantee) per Compressor Package including air compressor for 1st year during warrantee period in all Geographical Areas of BGL inclusive of all manpower, spare parts, lubricants and consumables, etc. including the Preventive Maintenance at regular interval by as per recommendation of OEM, Breakdown Maintenance as and when required for (1 package X 12 Months) The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.40% (maximum 1.5%) of | Machine Months | 12 |

| | | | |
|---|---|---|---|
| | unit price (sl.no 1) quoted by the bidder. | | |
| B3 | For 2nd Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.50% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder . | Machine Months | 12 |
| B4 | a. For 3rd year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.55% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder. | Machine Months | 12 |
| B5 | a. For 4th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.61% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder. | Machine Months | 12 |
| B6 | For 5th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.67% (maximum 1.5%) of unit price (sl.no B 1) quoted by the bidder. | Machine Months | 12 |

## 2.0. INFORMATION/ DOCUMENTS/ DRAWINGS TO BE SUBMITTED BY SUCCESSFUL BIDDER

Successful Bidder shall submit four copies of listed below, each of the following:

Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests, in nicely bound volumes.(Inspection site should be PESO approved and Lab should be NABL Approved)

Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items in nicely bound volumes.

Statutory test certificates, as applicable.

Filled in Quality Assurance Plan (QAP) for Purchaser's/ Consultant's approval. These QAPs shall be submitted in four copies within 10 days from LOI/PO.

WPS & PQR as required.

Other Drawing & document as specified in vendor data & drawing requirements as with Tender.

Detailed completion schedule activity wise (Bar Chart), within one week of placement of order.

Weekly & fortnightly progress reports for all activities including procurement.

Purchase orders of bought out items soon after placement of order.

Manufacturer's drawings/documents for bought out items, in 4 copies, for Purchaser's / Consultant's approval within 4 weeks.

Manufacturer related information for design of civil foundation & other matching items within 6 weeks of LOI/PO.

All approved drawings / design calculation / maintenance & operating manual documents as well as inspection and test reports for Owner's / Consultants reference / record in nicely category-wise bound volumes (in Hard Copy) and in Soft Copy separately.

Filled in data sheet for each instrument tag after sizing, range selection, proper selection of materials etc. shall be bidder's responsibility. Any necessary change required later for meeting the

Specification shall be done by the vendor without any price or delivery implications.

A list of documents to be furnished along with supply.

Bidder to furnish filled up documents / formats as per Commercial Volume of this tender.

# Section II: SCOPE OF WORK

### 1.0. SCOPE OF SUPPLY

The scope of work/services to be provided by the bidder shall be inclusive of but not limited to:

Design, Engineering, Manufacture, assembly, testing at manufacturer's works, field trial runs, and Equipment performance test along with associated electrical, instrumentation etc. as per bid document. Bidder shall consider average flow 400 SCMH.

Instrumentation and control system as specified on data sheets, P&ID including Local panel, Console/Local gauge boards, PLC, IOT based integration.

PLC based control panel HMI with IoT compatible.

Common structural steel skid for the compressor- Motor combination and for all auxiliary systems.

Air-cooled heat exchanger for inter stage and discharge gas.

All compressors have the necessary inbuilt infrastructure for installing a CNG cascade above them. Priority Panel at Package Discharge as per priority fill system.

All interconnecting oil, gas, water, air piping, cables within the compressor package.

All cable glands within the package and for incoming main power cable shall be supplied by vendor. Cable glands shall be of flame proof type.

Impulse and pneumatic piping/Tubing for all valves, fittings as specified & required for mounting the instruments. Block and bleed valves to be provided for Pressure gauges and pressure Transmitters.

NRV at final discharge.

CNG compressors shall have the inbuilt gas and fire detectors inside the enclosure. Location for Gas detectors is above the internal tubing or stage tubing and for fire detectors is above the motor and PLC panel.

Structural supports within the compressor package for all piping, instruments etc.

One no. relief valve at each stage discharge, first (1st) stage suction and Blow Down Vessel.

Y- type strainers, valves, sight flow indicators, check valves, auto & manual drain traps etc. as required for various auxiliary systems i.e. frame lube oil, cylinder lubrication system, cooling water systems etc.

Coupling/V-belts/pulleys.

Acoustic enclosure for Compressor package, with one number L.E.L detectors and one UV detectors in the enclosure.

- Common CO2 extinguishing system consisting of two cylinders, piping, valves and control systems, Also one CO2 cylinder will be extinguish at the time successful commissioning of compressor and that will be refilling by bidder.

- Inlet and outlet manual and automatic isolating valves for maintenance & emergency. Field Performance test at site.

- Supply of all erection & commissioning spares.

- One set of spare parts catalogue along with the priced bid, as built drawings, and Operation & Maintenance catalogue with each compressor package.

- Arranging 02 days onsite training program for operators and Client engineers by bidder

- Training of six engineers in three batches at Packager's works. The travelling, boarding, and lodging of Purchaser's engineers shall be borne by Purchaser. Each training module shall span for one week and shall cover the equipment constructional features, operational and maintenance procedures, practical hands on experience on assembling, dismantling etc.

- The compressor package control system shall be designed for unattended safe operation in automatic mode and shall unload, start, load, stop safely. The compressor shall start in auto in case high bank pressure in dispenser fall below 210 kg/cm2g and stop once the pressure in all three banks reaches 255 kg/cm2g.

- Compressor shall be suitable for continuously variable suction pressure from 210kg/cm2g to 30 kg/cm2g, supplied through LCV mounted CNG storage cascade. Irrespective of suction pressure booster compressor should deliver desired output pressure i.e. 255 kg/cm2g .

- The ingress of oil into CNG adversely affects vehicle emission and storage system. Hence in case of lubricated cylinders, vendor shall supply a proven, maintenance free oil removal system with automatic and manual drain after after-cooler to remove oil from removal system to restrict the oil less than 5 PPM in discharge compressed gas.

- Electric motor with hydraulic as Compressor Driver.

- For metering of natural gas, 1 No. Coriolis type Mass Flow meter shall be provided at the inlet/ outlet of Compressor Package as per the EIC instructions.

- Instrumentation and control system as specified in the tender document.

- One no. Instrument Air compressor/dryer package with air storage vessel of 1.5 KW motor rating as required for operation of complete compressor package along with dispensing unit. Also, bidder has to make necessary provision for ¼" OD with ball valve isolation to connect the dispenser Air requirement.

- Suitable Priority Fill System with compressor top-up facility inclusive of regulating valves, bypass valve & liquid filled pressure gauges as specified in technical specifications.

- Electrical equipment / Instruments being requested in the Compressor package.

- Separate junction boxes for different type of signals like analog, digital signals, alarm, shutdowns, and thermocouples, RTDs etc. for interfacing to local panel as per requirement.

- Main incoming cable from owners PDB to main control panel of the compressor is to be considered) through GI conduit/trenches, Cable from owner's electronic earth pit (EE) for electronic circuit in control panel, cable from owner's main earthing ring to control panel body earth and all inter connecting cables including complete erection accessories like double compression cable gland,

cable tags, lugs etc. as required. Bidder has to plan accordingly for supply, laying, termination, installation and commissioning of required cables to commission the compressor package.

- Fire and Gas detection system integrated with compressor instrument panel and should be installed in the package as fire detector above motor and panel and gas detector above the tubing and cylinder.

- Gas vent header

- Maintenance during the warranty period along with spares, consumables, lubricants, and manpower, etc., except electricity.

- Piping from air compressor and CO2 cylinders up to enclosures in the scope of bidder. One CO2 cylinder will be used at the time of Commissioning of compressor the refilling of extinguish cylinder in the scope of contractor.

- The provision for overhead compressor mounted mounting of min.3000 water liter cascade (with approximate weight of 7.5 tons) shall be envisaged & same shall be of enough strength having working space and ladder arrangement. Mounting of cascade on structure shall be in the scope of bidder. However, cascade shall be provided by purchaser. Structure Stability Certificate of the unit where cascade will be mounted to be during detailed engineering.

- Special tools and tackles along with Toolbox (List to be submitted with bid) Bidder may outsource auxiliaries' equipment from domestic market from reputed manufacturer approved by PURCHASER. However, the overall guarantee shall lie with the bidder.

**2.0. SCOPE OF WORK**

- Bidder's scope of work shall include but not limited to design, engineering, manufacturing, inspection, testing, supply including packaging, forwarding, insurance, custom clearance, handling and unloading as well as at PURCHASER stores, package performance test ( FAT) at Bidder 's shop and Site Acceptance Test (SAT) of " ELECTRIC MOTOR DRIVEN HYDRAULIC VARIABLE SUCTION CNG BOOSTER COMPRESSOR PACKAGES" as required for dispensing CNG to vehicles at various locations described in this tender. Electric type CNG Booster Compressor is designed to handle a flow rate of 400 SCMH from a variable suction pressure of 30 – 230 kg/cm2g to a discharge pressure of 255 kg/cm2g.).

- The variable suction Compressors have to be installed at the CNG outlets of Client's / Oil and Marketing Company (OMC) retail Outlets located in Hyderabad & Vijayawada GA for dispensing in vehicles. The suction of the compressor will be from Light Commercial Vehicle (LCV) mounted mobile cascades provided by Client and the compressed natural gas (CNG) will be dispensed in vehicles by the dispensers installed by Client.

- Bidder shall be responsible for supply, erection, commissioning, and field trial run. Noise level test and performance test of all packages at sites. The field trial run of the Variable Suction Compressor will be for continuous run of minimum of 04 hours in which satisfactory performance of the package together with all accessories auxiliaries and controls shall be established for satisfactory performance for specified operating conditions.

- The bidder has to maintain the compressors for all days in a year (including air compressor) during warranty & post warranty period under comprehensive maintenance period from the successful date of commissioning duly accepted by owner. The bidder has to keep the compressors operational round the clock by providing suitable technician cum operator and all the expenditures including manpower, spares and consumables, oil, lubricant etc. to make the compressors operational shall have to be borne by the bidder. The power required to run the compressors will be provided by Client. The contractor shall maintain the compressors in sound mechanical condition at all times. The contractor shall rectify the defects notified by Client immediately and should submit all the history log sheets and spares availability status along with the report in the format mutually agreed between Client and the bidder.

- Periodic inspections of Safety Valves. Transmitters. Pressure vessel gauge and any other equipment as per statutory norms of Telangana & Andhra Pradesh Factory Rules 1963. SMPV and Gas Cylinder Rules shall have to be carried out by the bidder at his own cost during the period of maintenance by the bidder. The inspections have to be carried out by competent persons as per advice of Engineer-in- Charge and certificates have to be submitted to Client.

- The contractor shall deploy adequate number of technicians / supervisors / Engineers / helpers as well as tools, spares, consumables and equipment for smooth and proper operation & maintenance of the Compressor supplied in terms of the contract. In case required to meet operational requirements, the contractor shall augment the same as per direction of Engineer–in-Charge. Contractor to submit a detailed organogram with key person details before starting maintenance of the compressor package. The maintenance staffs have to be available round the clock daily throughout the year.

- The contractor is required to carry out all services as mentioned in the Scope of Services and Schedule of Rates on all the 365 days including Sunday and all Holiday & around the clock.

- The contractor shall allow weekly rest and daily working hours to his workmen as per the relevant Act/Law and Rule made there under. However, no work shall be left incomplete/unattended on any holiday/weekly rest. Technician/operators provided shall have minimum qualification of ITI. Contract in person or his authorized representative shall provide the services on daily basis to interact with Engineer-in-charge and deployed workman.

- Bidder will make sitting arrangements to operators in process area to observe machine continuously, make a small shed for operators to seat.

- The work force deployed by the contractor for maintenance service of Compressors, shall be of sound relevant technical professional expertise which is otherwise also essential from the safety point of view of the personnel of the contractor as well as for the installation.

- Contractor has to ensure the safety of man and machine all the times. Damages of equipment due to negligence will be recovered as per the decision of Engineer-in-Charge, which will be final.

- Regarding work completion, the decision of the Engineer-in-Charge will be final and binding.

- The contractor shall make his own arrangements to provide all facilities like boarding and transport etc. to his workmen.

- All personnel of the contractor entering on work premises shall be properly and neatly dressed and shall wear uniform, badges while working on premises of the Owner including work sites.

- Contractor shall maintain proper record of his working employee's attendance and payment made to them.

- The contractor's representative/supervisor shall report daily to the Shift-in-Charge for day to day working.

- All the safety rules and regulations prevailing and applicable from time to time at the installations as directed by OWNER will be strictly adhered to by the contractor.

- It will be the responsibility of the contractor to pay as per the minimum wages of the appropriate government applicable under the Minimum Wage Act 1948.

- The services shall be provided on round the clock basis. The contractor is responsible to provide effective and efficient services in all shifts and assure that there is no disruption in the services for want of any resources.

- The contractor shall establish a central control room to operate 24 hours, seven days a week where complaint regarding non-performance of the Compressors in terms of the contract can be lodged. Further, the contractor shall deploy adequate number of operator/technicians/ supervisors / engineers at various site offices in consultation with Engineer-in-Charge to provide trouble free maintenance of the Compressors.

- All arrangements for communication from control room to the contract person working on job under the services shall be the responsibility of the contractor, viz. cell phone / walky-talky.

- The successful bidder shall indemnify the Owner from any claim of the contract labour.

- The successful bidder shall comply to all the rules regarding PF, ESI etc. as stated in the tender document.

- All the jobs mentioned under scope of services shall be carried out as per sound engineering practices, work procedure documentation, recommendation of the manufacturer and as per the guidelines/direction of engineer-in-charge of authorized representative.

- Summary of breakdown hour's station wise with analysis shall be submitted to CNG control room on a fortnightly basis both in hard and soft form as per OWNER format.

- The contractor has to submit the following documents on monthly basis along with the bill:

1. Preventative maintenance compliance report for that month along with the detailed service report.

2. Details of the compressor breakdown, summary of break down hours for that month and the cumulative break down hours along with breakdown response time.
3. Compressor parameter logbook for the month.
4. Certificate to be given by the bidder stating that they have complied with all the labour regulations and are following the minimum wages act.
5. All consumables, lubricating oil, coolant required for carrying out preventive / any type of maintenance shall be in the scope of supplier during the warranty period. The warranty spares shall be supplied by the vendor during the warranty period as per warranty clause.
6. All tools, tackles and fixtures required for carrying out the above maintenance of the compressor shall be in scope of the bidder. The scope will also include handling equipment's like crane, forklift, chain pulley block, etc required during the any maintenances activity.
7. Any correspondence required to be made with the principal company or OEM or various offices shall be made by the bidder or bidder's agent. All arrangements like phone, fax, computer, Internet etc. required for above correspondences shall be arranged by the bidder at his own cost.
8. The periodic maintenance required to be done as per OEM recommendation shall be taken up promptly. The bidder shall provide the detailed preventative maintenance schedule along with:

a) Estimated down time required for each type of maintenance schedule.

b) List of spares and their quantities required for each type of maintenance schedule per compressor.

c) Type and number of man days required for each type of maintenance schedule per compressor.

- Contractor team (Technician / Operator) – Roles and Responsibility:

The functions and responsibilities are listed below:

a) To function as an integral member of the BGL O&M coordination team.

b) Interface with Contractor / BGL on all equipment and system issues mobilize any Contractor / BGL resources required for scheduled or unscheduled maintenance.

c) Assist BGL personnel with development and implementation of sound operating and maintenance strategy and procedures, including corrective action guidance.

d) Assessments of consumables, operational and maintenance spares, OEM services etc. Maintain spares inventory well in stock to avoid any uninterrupted operations on round the clock basis.

e) Provide reports as per BGL O&M practices.

f) Conduct training programs for upgrading O&M resources, participate in all Contractor and safety trainings.

g) Collect and provide data as deemed necessary by BGL to analyse equipment performance.

h) Responsible for performing all routine, breakdown & scheduled maintenance activities during O&M.

i) Monitor the performance of equipment's.

j) Monitor all essential parameters of the running equipment and report any discrepancy in operational parameters.

k) Responsible for log-book data capturing, minor maintenance activities, safety of equipment's for safe operations.

l) The contractor shall submit a copy of the daily / weekly / fortnightly / monthly / bimonthly / quarterly and yearly performance report to the EIC in both soft and hard form. All stationery including the printed material such as compressor parameter log book, complaint log book, service report, break down summary report etc. shall be in scope of the Contractor.

Maintenance team shall be made available for work on 24 Hrs. basis

- The bidder shall plan such maintenances during non-peak hours and in consultancy with the Engineer in Charge (EIC) of OWNER. Any maintenance that needs to be taken up shall be well planned in advance with due approval of the EIC.

- The bidder shall use only OEM's certified spares during maintenances. All spares shall be kept in sealed OEM stamped packages. The packages shall be opened in front of OWNER representative during maintenance. In case, the schedule maintenance of the OEM manual recommends to check and replace parts like valve spring, valve plates, piston rings etc. after certain time interval, same shall replace or used further only on approval from the OWNER's representative. However, any untoward consequences for non-replacement of such parts shall be the responsibility of the bidder and spares, repair required to put back the unit into operation will be to bidders account.

- All routine and periodic checks / inspections required to be done as per OEM recommendation shall be done by the bidder. Instruments required for above inspection like Vernier calliper, micrometre screw gauge, fill gauges, bore gauge etc shall be in scope of the bidder and these instruments shall be calibrated every year.

- All parts replaced by the bidder during the above contract period shall be properly packed and handed over to OWNER, on replacement.

- The contractor shall submit a copy of the daily / weekly / fortnightly / monthly / bimonthly / quarterly and yearly performance report to the EIC in both soft and hard form. All stationery including the printed material such as compressor parameter logbook, complaint logbook, service report, break down summary report etc. shall be in scope of the bidder.

- Contractor has to ensure the safety of man and machine all the times. Damages of equipment due to negligence will recover as per the decision of Engineer-in-Charge, which will be final.

- All the maintenance / inspection job carried out by the bidder shall be recorded in a service report and the report of the same shall be jointly signed by OWNER representative and submitted immediately after carrying out the maintenance. Service report format shall be approved by OWNER.

- The EIC will be final authority to take decision with regards to maintenance or replacement of parts or any disagreement between the bidder and OWNER, during the execution of the contract.

- The bidder shall carryout calibration of gas detectors and flame detectors every six months or earlier as per requirement or instruction of EIC of OWNER. Also, yearly calibration of all instruments such as pressure gauges, transmitters, switches, mass flow meters etc shall be in the scope of the bidder. In addition to the above all safety relief valves shall also be tested and calibrated every year.

- Calibration of all the instruments and safety valves shall be done from government-approved laboratories and shall be carried out at least 15 days prior to the calibration due date.

- The bidder shall keep 1 set of safety relief valves in spare for the purpose of calibration.

- The bidder shall carry out retesting of pressure vessels periodically i.e. every year or earlier as per Gas Cylinder rules 2016 / Static & Mobile Pressure Vessels Rules.

- During the warranty period of one year and four years after warranty period the bidder shall maintain the compressor with spares and consumables at his own cost. (BGL reserve the right to commission the compressor with 15-days advance notice to bidder).

- The contractor shall make his own arrangement for the accommodation of his personnel at respective locations and subsequent transportation arrangement for them from their place of residence to work place or any other place as required and company shall have no obligation in this respect. The company shall not be responsible for providing any medical assistance to the contractor personnel.

- The contractor shall be responsible for the discipline and good behavior of all his personnel deployed in the services contracted out and in case any complaint is received against any of his employee, he

shall arrange to replace such persons within 24 hours of notice issued by the Engineer-in-Charge. The decision of the Engineer-in –Charge in this matter shall be final and binding on the contractor.

- The contract shall arrange to supply/renew identity card to his workforce at his own cost, if so required by BGL for security or for any other reasons. Those contractor's personnel shall be required to carry their respective identity cards while on duty and produce on demand.

- Nothing contained herein shall restrict BGL from accepting similar service from other agencies at its discretion and at the risk and cost of the contractor, if the contractor fails to provide the said services any time.

- C02 system shall be tested by the supplier every year by creating fire signal and actual discharge of Co2 gas from the cylinders. The cylinders have to be refilled by the vendor at no extra cost to purchaser / BGL after testing. If the system fails during testing, subsequent testing and refilling would be at vendor's cost. Weight and pressure of Co2 shall be monitored through PLC. Hydrotesting of Co2 cylinders to be carried out by bidder as per statutory requirements under factory act & Gas cylinders rules. Weighing type CO2 flooding system with auto operation shall be provided by the bidder.

- Bidder shall ensure the chemical cleaning of the packages is carried out once in year prior to the summer season.

- **SUB-LETTING OF CONTRACT**- No part of the CONTRACT nor any share or interest therein shall in any manner or degree be transferred, assigned or sublet by the BIDDER directly or indirectly to any person, firm or corporation whatsoever without the consent in writing, of the ENGINEER/EMPLOYER except as provided for in the succeeding sub-clause.

- **SUB-CONTRACTS FOR TEMPORARY WORKS ETC**.: The EMPLOYER may give written consent to Sub-contract for the execution of any part of the WORK at the site, being entered in to by BIDDER provided each individual Sub- contract is submitted to the ENGINEER-IN-CHARGE before being entered into and is approved by him.

- **iii) CONTRCATOR'S LIABILITY NOT LIMITED BY SUB-CONTRCATORS**: Not withstanding any sub- letting with such approval as aforesaid and not withstanding that the ENGINEER-IN-CHARGE shall have received copies of any Subcontracts, the BIDDER shall be and shall remain solely responsible for the quality, proper and expeditious execution of the Contract in all respects as if such sub-letting or Subcontracting had not taken place, and as if such work had been done directly by the BIDDER

- The BIDDER shall bear all responsibility for any act or omission on the part of sub- BIDDERs in regard to work to be performed under the CONTRACT.

- **iv) EMPLOYER MAY TERMINATE SUB-CONTRACTS**: If any SUB-CONTRCATOR engaged upon the works at the site executes any works which in the opinion of the ENGINEER-IN-CHARGE is not in accordance with the CONTRACT documents, the EMPLOYER may by written notice to the BIDDER request him to terminate such subcontract and the BIDDER upon the receipt of such notice shall terminate such Subcontract and dismiss the SUB-BIDDER(S) and the later shall forthwith leave the works, failing which the EMPLOYER shall have the right to remove such SUB- CONTRCATOR(S) from the site.

- **v) NO REMEDY FOR ACTION TAKEN UNDER THIS CLAUSE**: No action taken by the EMPLOYER under the clause shall relieve the BIDDER of any of his liabilities under the CONTRACT or give rise to any right or compensation, extension of time or otherwise failing which the EMPLOYER shall have the right to remove such SUB-CONTRCATOR(S) from the site. except for the authorized agent. Bidder shall mention the details of authorized agent in their bid.
- **vi) BIDDER has responsibility as a Principal employer to check all the statutory compliances of the deployed staff at BGL site by Sub-Letting contractors. BIDDER has to check all the documents and verify it. BGL is not responsible for any dispute regarding statutory compliances.**

**3.0. EXCLUSIONS**

The following are excluded from the scope of the bidder:

- All civil works and foundation design, however the bidder shall furnish all the relevant data for design of any pedestal if required.

**The design, construction, manufacture, supply, testing and other general requirements of the compressor package equipment shall be strictly in accordance with the data sheets, applicable API codes, Technical specification, approved drg /document and shall comply fully with relevant National/ International standards, Indian Electricity Act, Indian Electricity Rules, regulations of Insurance Association of India and Factories Act while carrying out work as per this specification. Any modification suggested by the statutory bodies either during drawing approval or during inspection, if any, shall be carried out by the Bidder without any additional cost and delivery implications.**

## 4.0. CODES & STANDARDS

**Following codes, standards, and regulations to be considered:**

- **API-11P, Second edition, API 618**
- **NFPA-37, OISD 179, NFPA-52: 2006,NFPA -496, NFPA -68, NFPA70**
- **ANSI, ASTM, NEC, NEMA**
- **Indian Electricity Rules, Indian Explosives Act.**
- **EUROPEAN NORM P.E.D. , Italian NORM D.P.R. 547/55**
- **EUROPEAN NORM P.E.D , D.M. 24.5.02 - D.M. 28.6.02**
- **D.M 24.11.84 parte prima - sez. II° , D.M. 24.5.02 - D.M. 28.6.02, DIN 2413, SAE J 514**
- **EUROPEAN NORMS, CEI EN 60079-10/CEI EN 60079-14/CEI, EN 60204-1/ CEI EN 60439-1, ATEX STANDARD**
- **OISD 142**
- **IS 5572**
- **OISD 179, NFPA-52: 2006, NFP-496, NFPA-68, NFPA-70 or equivalent**
- **NFPA – 37**
- **NFPA – 12- CO2 Flooding system**
- **IS: 325/ IEC or International standards. – Standards for electric Motor**
- **IS: 6382**
- **Applicable ANSI, ASTM, NEC, NEMA code**
- **API – 618/API 11 P**
- **EURO EAN NORM P.E.D., Italian NOR M D.P.R. 47/55**
- **EURO EAN NORM P.E.D, D.M. 24.5.02 - D.M. 2 8 .6.02**
- **API – 661: Specifications for Air cooled exchangers**
- **ASME Section – VIII Div. – 1/2 Design codes for pressure vessels.**
- **Gas Cylinder Rules 2016.**
- **Standard Specifications of Bureau of Indian Standards (BIS).**
- **Specifications/Recommendations of IEC.**

- **Indian Electricity Rules.**
- **Indian Explosives Act.**
- **Delhi Factory Rules, 1950**
- **TEMA – C - Water cooled heat exchangers**
- **ASME / ANSI – B-31.3 Code for Process Piping**
- **DIN 2413-This standard covers the design of steel bends and bent pipes of circular cross section used in pressure pipelines.**
- **SAE J 514-Standard for CNG hydraulic tube fittings and O-ring**
- **CEI EN 60079-10-Classification of area for explosive gas atmosphere**
- **CEI EN 60079-14-Design, selection and installation of electrical systems for areas with potentially explosive atmosphere.**
- **CEI, EN 60204-1-Standard for safety of machinery — Electrical equipment of machine**
- **CEI EN 60439-1-Standard for safety of electrical equipment**
- **ATEX-Standard for describing electrical equipment and workspace is allowed in an explosive atmosphere.**

## 5.0. OTHER CONDITIONS OF WORK

### 5.1 UTILITIES & BATTERY LIMITS

#### 5.1.1 UTILITIES.

Air compressor along with 1.5 KW electric motor having discharge pressure of 10 kg/cm2g with dryer shall be supplied by the bidder. Air receiver of 100 water liter capacities shall be provided. Air dryer suitable for automatic operation shall also be supplied along with all accessories. Air compressor, drier and air receiver for instrument air, shall be kept off the package in safe area or client's building. Piping, electrical & instrumentation cabling shall be in bidder's scope. Necessary FR unit shall be provided as per requirement. Manual drains and automatic moisture traps shall be provided in the system. Air receiver shall be provided with SRV, pressure switch, pressure gauge and drains. Pressure switch and pressure gauge shall have DBB isolation valve. Air dryer shall be with bypass arrangement.

Two Number Tapping from air receiver and dryer shall be provided as follows:

a) For dispenser: One tapping with isolation valve from air receiver.

b) For booster compressor: One tapping with isolation valve from air receivers.

Cooling water is not available as utility and the package shall be provided with self-sufficient cooling water system for Compressor, as required, with makeup tank. However cooling water for makeup tank is available. All the electrical equipment in this system shall be suitable for area classification of Hazardous area CLASS- 1, DIVISION-1, GROUP-D as per NEC.

All electrical and instrumentation terminals shall be as specified. Electric power shall be made available by Owner.

For running the compressor and illumination 415 Volt (±10 %) 3-phases 3 Wire, 50 Hz (±5%) shall be provided to starter panel to feed the compressor motor. Bidder shall indicate power/ Feeder (KW/Amp) requirement in the offer.

Purchaser shall provide UPS (240 ±1 % V, 50 ±1 % Hz) for LCP. Bidder shall indicate power/ feeder (KW/Amp) requirement in the offer. Bidder to make arrangement for conditioning of power supply beyond above limit.

5.1.2 BATTERY LIMITS

All customer interface connections, gas Inlet shall be brought out to the package edge and terminated with ¾ —OD SS-Tube.

As and where specified on the data sheets all vents (i.e. Relief valve, distance piece and packing) shall be Mani folded and terminated at skid edge outside the enclosure and vented to safe height of 2.5m at package roof with proper support.

All drains from different process equipment, distance piece and packing shall be Mani folded and terminated as single point for customer interface duly flanged with isolation valve.

UPS and Non-UPS power shall be made available from power distribution board (PDB) in the electrical room. Supply, Erection and termination of all cables and accessories from feeder in electrical room (70 mtrs distance to be considered) shall be in the bidder's scope. Supply of suitable UPS considering load of 02 CNG dispensers along with 01 hour back up is in the scope of the bidder.

Electrical earth pit shall be made available at a distance of about 5-10 mt. from compressor package. Electrical

Earthing Cable from this earth pit shall be in the bidder's scope shall be terminated to dedicated earth provided in the panel through proper size of glands. Owner's earthing main ring shall be made available at compressor foundation for equipment earthing. Electrical earthing for motor shall be done through Cable and the body earthing to be done through GI strip of 25 x 3 inside the compressor package shall be in the bidder's scope.

**6.0.AS-BUILT DOCUMENTS**

On successful completion of hydrostatic testing, the Bidder shall prepare As Built drawings & reports of entire Filter separator system as specified in scope of work.

All —As Built‖ drawings / reports shall be submitted as below.

Four sets of hard copies of following documents shall be submitted by Bidder:

(i) As-built drawing of Compressor package GAD / Fabrication Drawing / P&ID etc.

(ii) Test Reports/Results/Records

In addition, the above documents shall also be submitted in electronic media i.e. CD ROM diskettes. Software used for the presentation of these documents shall be as follows:

| **Type of document** | **Software** |
|---|---|
| a) Test Reports/Results/Records | MS Word/Excel (MS Office 2000) |
| b) Drawings | AutoCAD |

For the purpose of preparation of as-built drawings, Bidder shall update the "Issued for Construction" (IFC) drawings approved by the Company.

**7.0DOCUMENTS TO BE SUBMITTED AT THE TIME OF BIDDING**

Sizing calculation of Compressor package, data sheet, power requirement, Reference list of similar equipment supplied in past, Preliminary GAD of Compressor package with overall dimension and weight and BOQ. Bidder is advised to comply with all the requirements of bid document without any deviations. Company reserves the right to reject any bid with deviations without making any reference to bidder.

## 8.0. BIDDER'S RESPONSIBILITIES

Bidder's responsibilities, besides the scope of work for supply to be performed by him defined earlier, shall also include the following:

a. Interpretation and verification of data/information furnished by Company. Any additional information/data/surveys etc. required by Bidder for detailed engineering shall be obtained by him. Company may assist him in obtaining such information/ data by issuing recommendatory letters etc.

b. Entire engineering for procurement & fabrication, including drawings, QA/QC procedures, etc. performed by the Bidder for the Compressor package system shall be reviewed and approved by Company. All works shall be executed based on approved documents only.

c. Review and approval of Bidder's documents by Company shall in no way relieve the Bidder from his sole responsibility for safe and efficient design, engineering, supply and subsequent smooth operation of the system.

d. Bidder shall depute independent third-party inspector from List of Recommended TPIA for carrying out all necessary inspections and review of test results/reports etc at your own cost.

e. Pre-commissioning/ commissioning assistance of entire compressor package.

f. Bidder shall carry out all testing and inspection of materials, equipment etc. through independent testing institutions, laboratories, if so desired by Company.

g. Any other work not specifically listed above but is required for successful completion of entire system.

## 9.0. CHECKLIST: SCOPE OF SUPPLY

Bidder shall furnish all equipment, drivers, auxiliary systems, instruments, and controls and safety devices as per the enquiry document. Anything required over and above what is specified, for safe and satisfactory operations of the equipment package shall be included by the Bidder in his scope.

Bidder to write 'YES' or 'NO' against each item. Bidder is required to include complete scope, as such 'NO' is not warranted. However, in case for any of the items if Vendor's reply is 'NO', Vendor should give reason for the same

**Bidder's scope of supply shall include but not be limited to the following:**

| Sl. No. | Description | Specified by Purchaser (YES/ NO) | Included by Bidder (as annexure/ page) | Remarks |
|---|---|---|---|---|
| 1 | Each compressor package shall be completewith: | | | |
| 2 | Document required for equipment qualification criteria submitted along with User's certificate | Yes | | |
| 3 | Area Classification: All electrical and electronic components as specified shall be suitable for hazardous area CLASS-1 DIVISION-1 GROUP- D as per NFPA 70 Article 500 or ZONE-1, GROUP IIA/IIB as per EIC/IS | Yes | | |
| 4 | Two nos. Modular type DCP fire extinguisher capacity 10 Kg, shall be provided with each Compressor in the enclosure. | Yes | | |
| 5 | One LEL, one fire detector (UV) and one FLP Lamp shall be provided in the enclosure. | Yes | | |
| 6 | One air compressor with air storage Vessel and air drier for utility air required. Gas shall not be allowed to operate instrumentation. | Yes | | |
| 7 | Cooling System at site is not available: It is required to have closed circuit radiators for cooling compressor and auxiliaries if needed which shall be in the scopeof the Bidder. | Yes | | |
| 8 | Safety relief valves on each stage of the compressor | Yes | | |
| 9 | Minimum flow capacity corresponding at suction pressure of 30 Kg/cm2 and discharges at 230 Kg/cm2 | 150-400 SCMH | | |
| 10 | Explosion proof Electrical panel to be installedin the hazardous area. | Yes | | |
| 11 | Electrical equipment of cooling system tobe explosion proof. | Yes | | |

| | | | | |
|---|---|---|---|---|
| 12 | All valves, tubing's, fittings, as specified and required within the compressor package shall be SS- 316 | Yes | | |
| 13 | CO2 flooding system included as per specifications | Yes | | |
| 14 | Instrumentations and control included as per specifications, including 01 No mass flow meter. | Yes | | |
| 15 | Acoustic enclosures for Motor & compressor for noise attenuation up to 70DBA @ 1 meter distance. | Yes | | |
| 16 | Priority Panel as specified at packagedischarge. | Yes | | |
| 17 | Cabling with cable trays for all electrical & instrumentation cabling within the package | Yes | | |
| 18 | All couplings and Guards | Yes | | |
| 19 | Set of Special tools & tackles and Toolbox(along with list) | Yes | | |
| 20 | Inspection and testing as specified on the data sheet and TS. | Yes | | |
| 21 | Documents: All data and drawings as requiredas per TS | Yes | | |
| 22 | Erection, commissioning, and PG test at site ofthe complete package | Yes | | |
| 23 | Foundation and anchor bolts is in the scope ofthe Bidder | Yes | | |
| 24 | Maintenance Services is as perTS. | Yes | | |

**10.0. GUARANTEED PARAMETERS:**

| Sl No | Description | Bidder to indicate |
|---|---|---|
| 1 | Average flow capacity (over full range of suction pressure from 210 kg/cm2g to 30 kg/cm2 varying on continuous basis) required min 400 Sm3/hr | |

| | | |
|---|---|---|
| 2 | Minimum flow capacity corresponding to suction Pressure of 210kg/cm2g | |
| 3 | Minimum flow capacity corresponding to suction Pressure of 30 kg/cm2 | |
| 4 | Minimum flow capacity corresponding to suction Pressure of 50 kg/cm2 | |
| 5 | Sound level of enclosure(required Max 70DBA) | |
| 6 | Electric power consumption in KWH with no (+) tolerance with overall full range of suction pressure (from 200 kg/cm2 to 30 kg/cm2 varying on continuous basis) to compress 400 SCMH gas with no (-) tolerance without air compressor and exhaust fan for loading and penalty purpose * | |
| 7 | Specific power consumption of compressor package Kwh/Kg CNG (Penalty purpose) * | |

Power loading shall be done on the basis of lowest power consumption quoted. In case of difference betweenthe indicated power consumption in the bid and actual power consumption observed during performance guarantee test and, penalty shall be levied for the differential unit. The

above price loading and penalty* shall be calculated based on the

following:E (Rs.) = (Ed) x Re x 6570 x Df

E = Amount of penalty or price loading in INR
Ed = Difference of units with the Lowest (for Loading) with the indicated KW (for penalty)Re = Unit rate of electricity which is Rs. 10/- per unit
6570 = 18 hrs per day for 365 days
Df = 3.274 (Discounting factor based on 5 years of operation)

**11.0. Penalty for Non-Performance during Maintenance Period**

**(a) On normal day (i.e. the day other than the schedule maintenance day):**

(i) The party has to ensure that the equipment's are available for operation for minimum 22 hours per day.

(ii) The contractor has to ensure 97% availability of each package cumulative on monthly basis. The maximum allowable 3% downtime shall include cumulative downtime for preventive maintenance, predictive maintenance, breakdown maintenance and any other related activity excluding OEM recommended major and top overhauling maintenance of compressor package . Cumulative Non-availability of any machine over and above 3% will attract penalty as given below.

1) Break-down time-up to 8 hours in a month - No penalty
2) Break-down beyond 8 hours till 16 hours in a month - Rs 5,000/-
3) Break-down beyond 16 hrs till 24 hours in a month - Rs 10,000/-
4) Break-down beyond 24 hrs till 48 hours in a month - Rs 20,000/-
5) Break-down beyond 48 hrs till 72 hours in a month - Rs 30,000/-
6) Breakdown beyond 72 hrs in a month - Rs. 40,000/-
7) Continuous Break-down beyond 72 hours till 360 hrs in a month- 25% of Monthly Invoice value
8) Continuous Break-down beyond 360 hrs in a month - 50% of Monthly Invoice value

(For example in a month having 30 days (30x24= 720 hrs), Maximum allowable down time without penalty will be 3% of 720 hrs i.e. ~22 hrs.)

In case there is a continuous break down beyond 72 hrs & upto 15 days, 25 % of monthly invoice value of concerned package will be deducted from monthly invoice. In case breakdown is prolonged beyond 15 days, 50% of monthly invoice value of concerned package will be deducted.

In any case/ any situation, total penalty will be limited to 50% of monthly invoice valve of concerned package.

The calculations for levy of penalty as mentioned above shall be calculated on CNG Compressor wise basis for each month for each locations of Bhagyanagar Gas Ltd.

**(b) On schedule maintenance day:**

(i) The party would be required to carry out the recommended schedule/preventive maintenance of the equipment for which the party has to indicate the time required for each type of schedule maintenance.

(ii) If the equipment is down for more than 4 hours & upto 8 hours beyond the time indicated for the agreed schedule maintenance, the party would be penalized Rs. 20,000/- and for more than 16 hours Rs. 40,000/- per day.

In any case, the maximum penalty imposed in a month for non-performance of the equipment would be limited to 50% of the amount of O&M charges to be paid to the party per month per compressor

- Non-availability of manpower in any shift/any workplace will not be tolerable.
- The BIDDER will be penalized for each such act as follows.
- For non-availability of compressor operator, PPE, Uniform = 5% of Max. Invoice value of Single Pkg. / Incident & Max. amount will be penalized up to 10% of the Max. Invoice value of each package in a month.
- If the BIDDER fails to provide PPE and Uniform to his manpower after stipulated time, BGL will provide the PPE and Uniform at his risk and cost considering original invoice value plus 20% overhead charges which will be recovered from BIDDER.
- We at BGL will not tolerate any kind of Indiscipline act at the premises from the BIDDER employee's during the service time. If any such incident happens, the BIDDER will be penalized 5% of the Max. Inv. Value / Incident & Max. amount will be penalized up to 10% of single package invoice value
- In any Case/any situation, total cumulative penalty from all accounts (i.e. from gas loss, break down time, statutory requirements etc.) will be limited to 50% of monthly invoice value of concerned package for concerned month.
- No penalty will be carried over to next month.

- For any IR (Industrial Relation) issue (like strike by operators for wages,union issues etc.) CNG station operation stopped, BIDDER will be penalized Rs. 25,000/- Incident. Max. Capping is up to Rs.1,00,000/- Month

- Non-availability of compressor due to malfunctioning or non-availability of any of its auxiliaries / part shall be considered as the non-availability of the compressor package and shall be liable for above penalty.

- The penalty clause will be put into force, immediately after successful commissioning and subsequent performance test (which will be for a minimum period of 72 hours) of compressor packages.

- Any reason for non-availability of compressor package and in scope of the bidder shall be liable for the above penalty.

- In case of any complaint regarding non-fulfillment of any obligation under the contract, BGL reserves the right to withhold payment to the contractor, and out of such amount and including the security deposit hold, make such payment as it may consider necessary for smooth and unhindered working of the contract.

- Bidder has to submit the supply invoices timely for release of CAMC bills , any delay beyond 15 days will attract penalty of Rs.10,000.- per instance .

- Non-Submission of RA/ CAMC bill by 15th of subsequent month will attract a penalty of Rs.10,000/- per instance and Rs. 100/- per day beyond 15 days of stipulated time for the applicable date of bill submission Same will be deducted from the running bills.

- Failure to comply with HSE requirements shall attract penalty of Rs. 5000/- per each Non-compliance.

- The BIDDER shall depute his Supervisor for supervision of the services to receive instructions from Engineer-in-Charge or his representative.

- CONTRACTOR'S RESPONSIBILITY- The contractor shall depute his Supervisor for supervision of the services to receive instructions from Engineer-in-Charge or his representative

**11.1. Penalty Due to power consumption.**

- The volumetric efficiency and rated output of the compressor shall be consistently within the limit. Power consumption per Kg gas compressed should be within the benchmark set by BGL. A present benchmark for specific power consumption is 0.07 Kwh/kg (Between CNG supply suction pressure of approx. 230 Kg/cm2 and mobile cascade disconnection at 30 Kg/cm2).

Sp. Power in Kwh/kg = Total power units consumed by the compressor/ 3 months

Total gas sold in same period i.e. In 3 months

- The extra electricity bill amount due to inefficient operation/maintenance shall be recovered from the lessor at the tariff prevailing at the time of operation. The extra electricity due to higher specific power consumption will be calculated as follows.

- The extra expenses to be recovered from the lessor in Rs = (Specific power consumption over and above the benchmark) x (prevailing power tariff inclusive of taxes, duties & levies) x (Total sale of gas during the billing period.)

**11.1.1. Compressor Capacity**

• Bidder shall guarantee average capacity of 400 SCMH from suction pressure of 30 to 200 kg/cm2 and discharge pressure of 255 Kg/cm2 at discharge temperature of 52 degrees centigrade with no negative tolerance for errors in instruments and measurements.

• For calculation purpose 1kg of CNG =1.42 SCM

• If bidder quotes less than 20 KWH. No advantage will be given for quoting less than 20 KWH. The same shall be used to establish the capacity at site during package performance test.

**11.2.2. Penalty towards Package Efficiency Loss**

• This penalty shall be imposed on compressor blocks not capable of delivering rated capacity of 400 SCMH

Following calculations shall be used for penalty towards package efficiency loss:

F = 2 x {(400 x H x RD x AD) – M}

Where, F = Penalty Amount in Rupees

H = Hours clocked in a month

RD = Average RD for the month using GC Data AD = Air Density = 1.22541

M = Discharge mass flow during the month in Kgs

Note: Gauge Pressure at Station Inlet shall be used as benchmark for imposition of penalties and not suction pressure being displayed at the PLC

**12.0. MANDATORY SPARES PARTS FOR HYDRAULIC DRIVEN RECIPROCATING COMPRESSOR PACKAGE**

a) 1 Set means the quantity required for one compressor package. Bidder to provide itemized detailed list of mandatory spares with parts number having validity period of 03 (three) years, in case owner is interested to purchase the same. Details items in the set will be as per OEM _s spare parts & maintenance manual.

b) In technical bid, bidder to provide itemized detailed list of mandatory spares without price.

c) In Priced bid, bidder to provide itemized detailed list of mandatory spares with price the list of mandatory spares which will not be the part of evaluation

**Section III: DATA SHEET OF CNG BOOSTER COMPRESSOR (400 SCMH)**

| DATA SHEET – HYDRAULIC VARIABLE SUCTION CNG BOOSTER COMPRESSOR | | | |
|---|---|---|---|
| **GENERAL** | | | |
| | Feed gas process conditions are as follows, | | |
| | Suction Pressure | 30 - 210 | $Kg/cm^2g$ |
| | Temperature | 35 | °C |
| | Flowrate | 400 | SCMH |
| | Discharge Pressure | 255 | $Kg/cm^2g$ |
| | **STANDARDS CODE** | | |
| | 1. PNGRB standards | | |
| | 2. Published standards | | |
| | 3. Indian standards | | |
| | 4. Oil India Safety Directorate (OISD) | | |
| | 5. API-11P, Second edition, API 618 | | |

6. International standards: ANSI, ASME, ASTM, API, SA, NACE, ISO, DIN, EN, etc.

**Notes**

1. **SCOPE OF SUPPLY FOR EACH COMPRESSOR PACKAGE:**

For Scope of Supply refer doc. No. VCS-1007-CGD-MC-SW-002 Attached with Tender.

**2.** For technical requirement, Refer Technical specification doc. No.VCS-1007-CGD-MC-TS-002 is attached with Tender

**3.** 3.Bidder to furnish complete filled in data sheet in API 618 format.

4.The Variable Suction Compressor shall be suitable for continuous operation on variable suction pressure from 250 kg/cm2g to30 kg/cm2g, supplied through LCV mounted CNG storage cascade and discharge pressure of 255 kg/cm2g

6. The compressor shall be designed to work for full suction pressure range of 210 kg/cm2g to 30 kg/cm2g.

7. Compressor suction scrubbers shall be fitted with vane pack mist eliminator. Vane pack shall remove liquid droplets down to10 microns or below.

8. Design code for

**piping -ASME/ANSI B 31.3**

**Pressure Vessel - ASME SEC-VIII, DIV 1**

**Gas Cooler -Preferable API-661**

7.

| DATA SHEET – COMPRESSOR | | | | | |
|---|---|---|---|---|---|
| **GENERAL:** | | | | | |
| **Service** | : | Natural Gas | | **Equipment Tag No.** | TBD |
| **Configuration** | : | 2 x 100 % | | **Running** | |
| **Compressor Type** | : | Non- Lubricating type, Variable suction Pressure reciprocating | | **driver Type** | Electrical Motor Driven Hydraulic |
| **Design margin** | : | | | **Capacity Control** | Automatic (VTA) |
| **Process Data** | : | For one Compressor | | **No of stages** | VTA |
| **Design Cases** | : | | | **No of Required** | 2 |
| **Gas handled** | : | Compressed Natural Gas (CNG) | | **Design code** | API- 618 & API 11 P - 2nd Edition |
| **Hazardous Area** | : | Zone 1 IIA/IIB | | | |
| **CASE-1** | | | | | |
| **Parameters** | | **Units** | **Booster Compressor Package** | | |
| Volume Flow rate | | SCMH | 400 | | |
| Mass flow | | kg/hr | **VTC** | | |
| **Inlet conditions** | | | | | |
| suction pressure | | kg/cm2g | 210-30(Continuous Variable suction) | | Note-13 |

| | | | |
|---|---|---|---|
| suction Temperature | | 35 (40 Max.) | |
| Molecular weight | kg/kmol | Ref Gas composition (VTC) | |
| mass density | kg/m3 | Ref Gas composition (VTC) | |
| Specific heat ratio | | Ref Gas composition (VTC) | |
| Compressibility factor | | Ref Gas composition (VTC) | |
| **Final Discharge conditions** | | | |
| Discharge pressure | kg/cm2g | 255 | Note-4,5 |
| Discharge Temperature | | 52 | Note-1,6 |
| Mass weight | kg/m3 | Ref Gas composition (VTC) | |
| Compressibility factor | | Ref Gas composition (VTC) | |
| Polytropic Efficiency | % | Note-7 | |
| Duty | KW | VTC | Note-8 |
| Total Power | KW | VTC | |
| Compositions in Mole % | | | |

| **Components** | **Normal Gas Composition Range** | **Design Case** | |
|---|---|---|---|
| Methane | 82.0 - 99.0 | 92.5 | |
| Ethane | 7.5 - 0.9 | 2.22 | |
| Propane | 3.5 - 0.0 | 1.84 | |
| i- Butane | 0.75 - 0.0 | 0.49 | |
| n- Butane | 0.75 - 0.0 | 0.49 | |
| i- pentane | 0.33 - 0.0 | 0.31 | |
| Hexane | 0.25 - 0.0 | 0.18 | |
| Carbondioxide | 4.9 - 0.0 | 1.9 | |
| Nitrogen | **0.08 - 0.0** | **0.07** | |
| H2S | 10 ppm | 10 ppm | |
| | | | |

**NOTES:**

1. Given temperature is booster compressor package outlet temperature. However, compressor dischargetemperature will be provided by vendor at their compressor datasheet.
2. Compressor vendor to confirm the compressor ratio.
3. Compressor vendor shall ensure the suitability of the material of construction for the Booster compressor for 35 °Csuction Temperatures & corresponding discharge temperature) s).
4. The discharge pressure provided is the discharge pressure at the end of final stages of compression.
5. The discharge pressure at each stage has to be provided by vendor.
6. The discharge temperature at each stage has to be provided by vendor.

| |
|---|
| 7. Polytropic efficiency will be provided by compressor vendor. |
| 8. The given duty is the Absorbed power of the compressor. |
| 9. Vendor to consider 10% margin on the flowrate to design compressor. |
| 10. Design Life of the compressors shall be minimum 25years. |
| 11. Ambient Temperature: 2 °C MIN / 47 °C MAX. |
| 12. The given suction and discharge properties is based on Design Operating case. Also, vendor to designcompressor suitable for normal gas composition range as specified above. |
| 13. VTA - Vendor To Advise |
| 14. VTC - Vendor To Confirm |

## Section IV: DATA SHEET OF INTERCOOLER / AFTERCOOLER:

| | | | | |
|---|---|---|---|---|
| 1 | **GENERAL** | | | |
| 2 | PROJECT: **PROCUREMENT OF CNG BOOSTER COMPRESSORS** | | | |
| 3 | OWNER: **M/S BHAGYANAGAR GAS LIMITED** SITE: **HYDERABAD AND VIJAYAWADA** | | | |
| 4 | Item No.: Service: **Intercooler / After cooler for Compressor Package** | | | |
| 5 | NOTE: ■ SCOPE OPTION / INFORMATION SPECIFIED BY PURCHASER □ INFORMATION REQUIRED FROM VENDOR. | | | |
| 6 | □ Manufacturer: | Type: □ Forced Draft □Induced Draft | | |
| 7 | □Bundle Size: m x m x m | Bundles/Section | | Number of Units: |
| 8 | Bundles/Unit: | In Parallel / Series | | Section Size: |
| 9 | Surface/Bundle: m² | Bare Tube: m² | | Section/Unit: |
| 10 | Surface/Unit: m² | Bare Tube: m² | | Plot Area/Unit: |
| 11 | **PERFORMANCE (Of One Unit)** | | | |
| 12 | Heat Exchanged: kcal/hr | | | MTD (Corrected): $^{U}$C |
| 13 | Transfer Rate: kcal/hr m² $^{U}$C | (Finned Surface) | | (Bare Surface) |
| 14 | **TUBE SIDE** | | | |
| 15 | Fluid Circulated | **GAS** | | Gravity: Liquid API SG @ 15.4EC |
| 16 | Total Entering Gas kg/hr | | | Enthalpy / Latent Heat kcal/kg |
| 17 | Operating Temperature | In: | Out: | Fouling Resistance hr m² $^{U}$C/kcal |
| 18 | Operating Pressure Passes / Bundle kg/cm² | | | |
| 19 | AIR SIDE | | | |
| 20 | Temperature | In: **47** | Out: | Altitude m |
| 21 | Total Flow/Unit kg/hr | | | Static Pressure kg/cm² |
| 22 | Quantity/Fan kg/hr | | | Power/Fan kW |
| 23 | Face Velocity m/sec | | | Power/Unit kW |
| 24 | **CONSTRUCTION (Each Bundle)** | | | |
| 25 | Design Pressure: kg/cm²g | Test Pressure: kg/cm²g | | Design Temperature: $^{U}$C |
| 26 | Code Requirements: | | | |
| 27 | Type of Tubing: | Tube Material: | | Fin Material: **Al** |

| | | | | |
|---|---|---|---|---|
| 28 | **Tube** Bare Tubes (no's): | No. of rows: O.D. Length | | BWG/Thk |
| 29 | Fins: Spacing /inch. O.D. | Root Dia | | Thickness: |
| 30 | **Header** Type: Plug / Cover | No. of Splits: | | Material: |
| 31 | Plugs/Gaskets | Side Frame: C.S. Inside Zinc Protected | | |
| 32 | Nozzles | In: | | Out: |
| 33 | **Coupling** | **Vent** | **Drain** | |
| 34 | **Construction (Each Section)** | | | |
| 35 | **Structure** | **CS** | **Sec./Gr. NO** | **Design Wind Load: Kgf/m** |
| 36 | Plenum Chamber | **CS inside Zinc Protected** | | Type: |
| 37 | **Fans** | **No.** | **Dia.** | **RPM** | **Mfr.** |
| 38 | **Blades** | **Material:** **Pitch Angle (Design):** | | **No./Fan** |
| 39 | **Hubs** | **Material:** | **Pitch: Autovariable / Adjustable (No.)** | |
| 40 | **Louvers** | **Material:** | **Type: Mfr.** | |
| 41 | **Weights kg Each Section (Dry) :** | **Full of Water:** | | |
| 42 | **Each Bundle (Dry):** | **Full of Water:** | | |
| 43 | **APPLICABLE SPECIFICATIONS API Standard 661** | | | |
| 44 | REMARKS 1. Air coolers shall be designed for 20% excess capacity than required normally. | | | |
| 45 | Exchanger shall be designed with air side temperature of 47 0C. | | | |
| 46 | Separate data sheet shall be filled by the bidder for each service i.e. Inter cooler and After cooler | | | |

## Section V: DATA SHEET OF LV INDUCTION MOTOR

| GENERAL INFORMATION | | | |
|---|---|---|---|
| Applicable To: Proposal Purchase As Built | | | Vendor shall complete Data Sheet with information not otherwise provided by Client: Buyer. |
| Facility: BHAGYANAGAR GAS LIMITED | | | Tag Number: |
| Location: & HYDERABAD & VIJAYAWADAGA | | | Manufacturer/Model No.: |
| Service: | | | |

| [TECHNICAL DATA SHEET] | | | |
|---|---|---|---|
| **1.00** | **GENERAL** | | |
| 1.01 | Vendor | * / # # | |
| 1.02 | Manufacturer | * / # # | |
| 1.03 | Country of Origin | * / # # | |
| 1.04 | Mechanical data validity (IFI/IFP) | * / # # | |
| 1.05 | Maximum delivery date | * / # # | |
| 1.06 | Type | | |
| 1.07 | Standards, Codes | | |
| 1.08 | General specification | | |
| 1.09 | Tag No. | | |
| | | | |
| **2.00** | **ENVIRONMENTAL/CONDITION** | | |
| 2.01 | Place of installations | Indoor | Outdoor |
| 2.02 | Altitude if>1000m | | |
| 2.03 | Maximum ambient temperature | | |
| 2.04 | Design ambient temperature | | |
| 2.05 | Relative Humidity | | |

| | | |
|---|---|---|
| 2.06 | Special conditions (Tropicalisation, etc..) | |
| 2.07 | Hazardous area (zone) | |
| 2.08 | Gas group | |
| 2.09 | Auto ignition temperature | |
| | | |

| | | | |
|---|---|---|---|
| **3.00** | **DRIVEN EQUIPMENT CHARACTERISTICS** | | |
| 3.01 | Driven Machine | * compressor Fan Pump | |
| 3.02 | Service conditions | S1 | S2 |
| 3.03 | Maxi shaft power | * | |
| 3.04 | Shaft power at operating point | * | |
| 3.05 | Brake torque curve (kn2...) | * | |
| 3.06 | Required starting brake torque ( Nm) | * | |
| 3.07 | Moment of Inertia MR2 (kgm2 ) | * | |
| 3.08 | Driver Machine Speed RPM | * | |
| 3.09 | Drive (Direct / Belt) | * | |
| 3.10 | Coupling | * | |
| 3.11 | Toward Motor Thrust | * Transient | Continuous |
| 3.12 | Toward Coupling Thrust | * Transient | Continuous |
| 3.13 | Radial Thrust | * Transient | Continuous |
| 3.14 | Number of Belts | * | |
| | | | |
| **4.00** | **FOR AIR COOLERS EXCHANGER ONLY** | | |
| 4.01 | Motor in/outside air flow | * | |
| 4.02 | Motor Ventilation Against Air Flow | * Yes | o |
| 4.03 | Max. Temp. of air (°C) | * | Air Speed: * m/s |
| 4.04 | Weight Supported by the Shaft End kg | * | |
| | | | |
| **5.00** | **MOTOR GENERAL CHARACTERISTICS** | | |
| 5.01 | Rated power kW | # # | |
| 5.02 | Synchronous Speed RPM | # # | |
| 5.03 | voltage ( +/- 10%) | | |
| 5.04 | Phase | | |
| 5.05 | Frequency (+/- 5%) | | |
| 5.06 | Mounting Symbol | * / # # | |
| 5.07 | Height of Shaft | * / # # | |
| 5.04 | Degree of Protection (IP) | | |
| 5.05 | Number of Consecutive Start ups Cold | | |
| 5.06 | Number of Consecutive Start ups Warm | | |
| 5.07 | Insulation Class | | |
| 5.08 | Temperature Rise at (55°C) | | |
| 5.09 | Type of Starting | | |
| 5.10 | Cooling Type | | |

| | | |
|---|---|---|
| 5.11 | Impregnation | # # |
| 5.12 | Direction of Rotation Facing Motor Shaft | * CW CCW/2 |
| 5.13 | Protection for Hazardous Area (Ex' d'...) | |
| 5.14 | Gas Group (IIB...) | |
| 5.15 | Temperature Class / Maxi. Surface Temperature | |
| | | |
| **6.00** | **MOTOR ELECTRICAL CHARACTERISTICS** | |
| 6.01 | Rated Current (or Full Load Current) | # # |
| 6.02 | No Load Current | # # |
| 6.03 | No Load Power | # # |
| 6.04 | Locked Rotor Current (LRC) (%) | |
| 6.05 | Efficiency at | # # |
| 6.06 | Power Factor at | # # |
| 6.07 | Locked Rotor Power Factor Cos 0 | # # |
| 6.09 | Thermal Time Constant | # # |
| 6.10 | Permissible Locked Rotor Time (Cold, Warm) | # # |
| 6.11 | Running Up Time Under Full Voltage | # # |
| 6.12 | Running Up Time Under 80% Voltage | # # |
| 6.13 | Permissible Voltage Drop at Starting (%Un) | |
| 6.14 | Full Load Speed (at 4/4 Load) | # # |
| 6.15 | Locked rotor torque at Un/0.8 Un (% FLT) | # # |
| 6.16 | Pull up torque at Un/0.8 Un ( % FLT) | # # |
| 6.17 | Breakdown torque at (% FLT) Un/0.8Un | # # |
| 6.18 | Vibration at no load ( % mm/s RMS) | # # |
| 6.19 | Critical Speed ( % r/min) | # # |
| 6.20 | Maximum transient air gap torque when<br>- 2 phase circuit at motor terminal Nm<br>- 3 phase circuit at motor terminal Nm | # # |
| | | # # |
| | | |
| **7.00** | **MOTOR MECHANICAL CHARACTERISTICS** | |
| 7.01 | Frame material | # # |
| 7.02 | Moment of inertia MR2 kgm2 | # # |
| 7.03 | Total weight kg | # # |
| 7.04 | Bearing | # # Antifriction sleeve |
| 7.05 | Bearing at coupling side/Opposite to coupling side | # # |
| 7.06 | Axial Thrust bearing | # # C.A Without C. |

| | | |
|---|---|---|
| | | O.A |
| 7.07 | Lubrication (Grease/oil) | Grease Oil |
| 7.08 | Painting | # # |
| 7.09 | Noise Level (Lp.Lw) dBA | |
| 7.10 | Service Factor | |
| | | |
| **8.00** | **MOTOR CERTIFICATIONS** | |
| 8.01 | Nr. Of certification ( for motors located in Hazardous area) | |
| 8.02 | Certifying Authority | |
| | | |
| **9.00** | **MOTOR AUXILIARY EQUIPMENTS** | |
| 9.01 | Anti-condensation Heater Protection for Hazardous Area | |
| 9.02 | Anti-condensation Heaters (power, Voltage) | |
| 9.03 | Thermistor protection for motors | |
| | | |
| **10.00** | **MOTOR CONNECTIONS** | |
| 10.01 | NR. Of terminals Brought out | |
| 10.02 | Earthing Terminal (In / Outdoor, Section) | |
| 10.03 | Start or winding connection symbol (star/delta) | |
| | | |
| **11.00** | **MAIN TERMINAL BOX** | |
| 11.01 | Short Circuit rating kA | |
| 11.02 | Protection (Gas Group, Temp. Class) | |
| 11.03 | Orientation | # |
| 11.04 | Cable Gland Opening Type | |
| 11.05 | Cable Size mm2 | # |
| 11.06 | Overall Diameter mm | # |
| 11.07 | Diameter Over Armour mm | # |
| 11.08 | Diameter Under Armour mm | # |
| | | |
| **12.00** | **AUXILIARY TERMINAL BOXES** | |
| 12.01 | Heater Terminal Box KA | |
| 12.02 | Protection (Gas Group, Temp. Class ) | |
| 12.03 | Orientation | # |
| 12.04 | Cable Gland Opening Type | |
| 12.05 | Cable Size mm2 | # |
| 12.06 | Overall Diameter mm | # |
| 12.07 | Diameter Over Armour (mm) | # |
| 12.08 | Diameter Under Armour (mm) | # |
| | | |

| 13.00 | INSPECTION & TESTS | |
|---|---|---|
| 13.01 | Inspection and Tests | |
| | | |
| **NOTES:** | | |
| | * Data to be filled by supplier with its bid in the supplier data column, those data shall be in accordance with standard specification. | |

| | |
|---|---|
| | Date to be defined during engineering |
| | Data by motor manufacturer |

**Section VI: TECHNICAL SPECIFICATION**

## 1.0 SCOPE

This specification provides vendor the technical and operating conditions for the CNG hydraulic compressor must fulfill. Additional features other than those indicated herein which call for a better design, increase in efficiency, enhance reliability, optimization may be accepted subjected to Client's approval. The Compressor package shall be shipped in completely assembled condition. Gas supply line and delivery connection shall be made at site.

The vendor shall bid their main offer, items according to the technical specifications mentioned below.

## 1.1 HYDRAULIC DRIVEN RECIPROCATING COMPRESSOR

To increase the dispensing speed & reduce waiting time for filling at daughter booster station and better utilization of cascade capacity, hydraulic type motor driven reciprocating CNG variable suction booster compressor of capacity 400 SCMH at 210 to 30 kg /cm2 suction pressure has been envisaged at daughter booster station.

Hydraulic driven reciprocating compressor with electric motor, hydraulic pump and piping, cooling system, suction and discharge filters, control panel safety and control devices,

tubing, valves, instrument and other accessories required for automatic and safe operation of the system.

The pistons / cylinders are actuated by hydraulic fluid instead of connecting rod. The hydraulic driven compressors are suitable for high suction pressure and for relatively low volume filling. The CNG gas shall be totally oil free, hence the membranes are inserted for positive separation.

The Bidder shall meet all applicable statutory codes, National law and Local regulation for safety and environment protection.

Bidder shall include all interconnecting piping tubing/cables.

The compressor package control system shall be designed for unattended safe operation in automatic mode and shall unload, start, load, stop safely. The compressor shall start in auto in case high bank pressure in dispenser fall below 210 kg/cm2g and stop once the pressure in all three banks reaches 255 kg/cm2g.

The priority fill system will ensure maximum flow rate by filling of vehicle and storage cascade.

Compressor shall be designed to ensure flow capacity and operating suction and discharge pressure as indicated in data sheet attached with tender.

## 1.2 COOLING SYSTEM

Each compressor package shall be complete with its own cooling system. The cooler shall be air cooled heat exchanger. The gas temperature aftercooler shall not exceed 52 deg C. For calculating the surface area of the cooler, the ambient air temperature of 47 Degree C and 80% RH shall be considered. Cooler design shall be based on 20% extra load corresponding to max severe operating conditions based on the thermal duty. Cooling system to be preferably installed on same skid along with compressor due to space constraint. Therefore,

all electrical and instrumentation equipment installed shall be as CLASS-1, DIVISION 1, GROUP D of NEC or ZONE-1, GROUP IIA/IIB, IS/IEC.

**ELECTRICALS**

**a) Prime mover (Electric Motor)**

The motor shall be flame proof/ explosion proof and confirm to IS: 2148 suitable for zone 1 group IIA and T3 area as per IS/IEC The Motor shall be of standard frame size as per IS/IEC and rated for continuous duty with high efficiency and shall be designed for star-delta starting. The Motor shall be provided with class 'F' insulation. However, temperature rise shall be limited to the temperature specified for class 'B' insulation as per IS and sha be suitable for voltage variation of 415V±10%. The bidder shall indicate the guaranteed total power requirement in KW. The motor rating shall be 110% of the greatest BKW required by the compressor. Bidder to furnish fille in data sheet of electric motor attached with tender.

| | | |
|---|---|---|
| a) | Type of drive | Totally enclosed fan cooled (TEFC) high efficiency s per IEEMA standard19-2000 |
| b) | Protection Explosion proof | IP.55 |
| c) | Insulation | Class -F‖ with Class -B‖ temperature rise |
| d) | Mounting | As per system requirements |
| e) | Specification standard | IS-325 |
| f) | Supply voltage (assumed) | 415 ± 10%-volt, 3 phase, 50 ± 5%Hz |
| g) | Nos. of hot starts of motors | 4 per hours |

**b) Motor accessories as required**

Bidder to include as per package requirement.

**c) Electrical supply parameters:**

All electrical shall be suitable for the following supply conditions.

Electrical operating voltage : AC, 3 phase, 415 V,50 Hz

Electrical control voltage : 240 VAC, 50 Hz (under supplier 's scope)

Tolerance of voltage : ± 10%

Tolerance of frequency : ± 5%

### d) Electric Specification

All electrical equipment of compressor package shall be installed in accordance with Zone 1, Gas group IIA, T3, IS 5571 and shall have approval of a recognized certifying authority.

Purchaser/Client shall provide 415 ± 10% volts, 3 phase and 50 ± 3% Hz electrical connection at CNG station electrical panel only.

Vendor shall supply the starter cum local control panel and the same shall be flame proof construction with IP 54Certificate from recognized agency to the effect that equipment supplied and or installed conform to above area classification. All devices shall meet the requirement for the specified area classification in which they are installed, including instrumentation leads.

Vendor shall supply all the cable within the package. The power & control cables rated low voltage shall bedesigned for a system voltage of up to and including 1100V. The conductor shall be either annealed copper aluminum for power cables and annealed copper for control cables. Conductors 6mm2 and larger shall bestranded. Conductors below 6mm2 may be stranded or solid as per IS 8130. The cables shall be suitable for us where combination of ambient temperature and temperature rise due to load and short circuit condition results conductor temperature not exceeding the following.

| Type of Insulation |
|---|
| General purpose PVC |
| XLPE |

The insulation shall be of cross-linked polyethylene conforming to the requirements given in Table-1 of IS: 7098 Part-1. The average thickness of insulation shall be not less than nominal value specified in Table-3 of IS: 7098 Part-1. The Filler and Inner sheath shall be of extruded PVC conforming to the requirements of Type-ST2 of IS 5831 for XLPE cable. The thickness of inner

sheath shall be as given in Table-5 of IS: 7098 Part1.

Armour shall be Galvanized steel round wires/strip for multi-core cables and Aluminum for single core as per IS 3975.

Outer sheath shall be Extruded FRLS (flame Retardant, Low smoke), Type ST2 PVC of IS 5831 for XLPEcables, colored BLACK.

All the above cables are intended to be used in hazardous gas areas. The cable shall accordingly be identified on outer sheath as per IS. The resistance of the armour shall not exceed that of the conductor as specified in IS 8130 by more than 33%.

### e) Cable entry

Control panels: Bottom

### f) Cable Glands and Cable sealing

Cable gland shall be ex`d` type with suitable size double compression type Nickel Plated brass glands are to be supplied for all cables. For entries into Ex'd' enclosures, barrier type (or compound filled) glands are provided. Al cable glands and adaptors are to be type tested and certified by appropriate authorities for use in specified hazardous area.

### g) Earthing System

The design & installation of earthing system shall be as per IS 3043 or equivalent international specification. Thedesign and installation of earthing within the package shall be vendor scope. Vendor to provide provision for skidearthing. One or more no of earth plates with provision of inter connection to main earth grid shall be provided.

Phase sequence preventer (Current based) shall be provided.

### h) Vibration

Compressor maximum vibration of cylinders shall not exceed 10 mm/sec unfiltered peak velocity. Maximum vibration level of installed compressor frame shall not exceed an unfiltered peak velocity of 5mm/sec or 200 micron unfiltered peak-to-peak vibration whichever is less. The bidder shall provide for all structural suppor within the package so that these levels can be achieved.

## 1.4 INSTRUMENTATION & CONTROLS

All the instruments and control shall be suitable for area Class I, Group D, Division I.

All package mounted transmitters & temperature elements, solenoid valves, switches and related junction boxes shall be flame proof 'd' as per IEC 79-1. Other special equipment / instrument, shall be flame proof/explosion proof as per IEC 79-1.

The compressor package instrumentation & control is to be configured for manual as well fully automatic control system including starting, shutdown as applicable for unattended operation.

Suitable barriers may be used for safety.

All the instrumentation shall be capable or operating for full range of operation.

Separate junction boxes shall be provided for each type of signal/control/power cables. All Signal, control and RTD cables shall be of 250V grade made of copper conductor of min 1.5 mm2, PVC insulated, PVC Shredded and armoured.

Suitable bypass for interlocks shall be provided for startup

**Emergency shutdown (ESD) System** is also in scope of vendor. This shall be in accordance with NZS-5425. A fail-safe system shall be designed and incorporated to isolate cascades storage from dispensers, stop compressor, isolate the compressor suction and cut off power supply on activation of ESD switch. Bidder has to provide the 04 nos. of ESD's along with required length of cables ( 01 compressor body, 01-electrical panel, 01- fencing and 01-sales/ control room building).This ESD switch shall have to be manually reset to restart the compressor package again.
Compressor package shall be provided with following instruments:

1.All tripping shall be with lamp indication and annunciation.

2.Temperature indication: each stage discharge and after- after cooler

3.Pressure indication: each stage discharge, high & med bank; Pressure switch final stage discharge,

high & med bank

4.Hydraulic oil tank: Level switch, temp indication & switch; Pump Pressure indication.

5.Coolant: Temp & pressure indication & switch and temp indication after cooler.

6.Hour meter.

7.One no. Pressure Switch/Transmitter shall be installed in the inlet line to compressor.

8. 01 no. Coriolis mass flow meter with integral local display with transmitter shall be installed for metering of gas.

### 1.5 PRIORITY FILL SYSTEM

Vendor shall supply a suitable priority fill system with compressor top-up facility inclusive of regulating valves, bypass valve & liquid filled pressure gauges all mounted in a stainless steel structural. The Priority fill system shall ensure that vehicle filling takes precedence over cascade filling.

Tubing and valves from LCV cascade and stationary cascade to compressor shall be ¾"SS 316 OD and other tubing and valves shall be minimum 1/2" size. End connections shall be 3/4" size pipe OD. Suitable priority along with valves (for example 3-way Valve) shall be provided so that compressor can take suction either from LCV cascade or from stationary cascade as described following:

**Case -I: Suction from LCV Cascade**

(a) If the LCV Cascade pressure is more than 210 kg/cm2g, the gas dispensing should take place directly from LCV to dispenser bypassing booster compressor.
(b) Compressor shall start on automatically start when the LCV cascade pressure falls below 210 kg/cm2g.The priority of filling shall be as follows:

- First priority: Priority panel shall first fill the vehicle through dispenser.
- Second priority: If no vehicle is to be fuelled, priority panel shall fill the stationary cascade. The compressor shall shutdown automatically when either all stages of stationery cascade are filled to a pressure of 255 kg/cm2g or pressure in mobile cascade is less than 16 kg/cm2g.

**Case -II: Suction from stationary cascade**

a) Dispensing shall be done through stationary cascade without compressor running if stationary cascade pressure is more than 210 kg/cm2g.

b) Compressor shall start on pressing of manual start push button if stationary cascade pressure is less than 210 kg/cm2g. Dispensing into the vehicle should take place as usual. Compressor shall trip if either there is no vehicle or cascade pressure 255 Kg/cm2.

### 1.6 ENCLOSURE OF HYDRAULIC DRIVEN CNG COMPRESSOR PACKAGE

The maximum ambient temperature within the enclosure shall be limited to 52 Degree C based on the ambient temperature of 47 Degree C. Adequate ventilation fans shall be provided to meet the above and also to account for heat dissipation of the coolers.

The compressor package shall consist of single enclosure for Compressor and Electric Motor. The equipment shall be mounted on one common skid. The Enclosure to restrict maximum noise level to 70 DB(A) at 1 meter from the enclosure.

Enclosures shall be provide with a degree of protection equivalent to IP 55 as defined in AS 1939,

shall be flame proof.

All the pressure, temperature, gas flow meter, oil level, lube oil pressure, coolant temperature, coolant level indicators shall be preferably visible from outside of enclosures.

Enclosures shall have internal flame proof lighting arrangement. For handling of all heavy parts for maintenance purpose lifting arrangement i.e. beam fitted with chain hoist shall be provide inside enclosure.

The Compressor shall be located inside an acoustic enclosure at Grade Level. All accessory and auxiliary system along with interconnecting piping shall be inside an enclosure, enough headroom shall be made available for easy access and maintenance of all equipment.

Components such as pressure gauges, temperature and pressure switches etc., which require in-situ adjustment and reading, shall be easily accessible.

Conduits and tubing shall be arranged in orderly and systematic manner and shall be routed neatly to enter the back of display or monitoring panels.

Routine service item such as, but not limited to, oil filters, gas filters and drive belt shall be located to facilitate easy one-man servicing.

Items which must be operated & monitored during operation shall be readily accessible without opening the enclosure door. For which, if required, separate partition with door must be provided.

Suitable gradients shall be provided on the enclosure roof for rain drainage and to avoid water pockets.

## 1.7 PIPING AND TUBING

All rigid piping, tubing & other components of compressor package shall be designed for full range of pressure & temperature and loading to which they may be subjected with a factor of safety of at least 4 based on minimum specified tensile strength at specified ambient temperature. Compressed air header and water piping shall be GI or seamless steel. The instrument air tubing material shall be SS-316/SS304. All lube oil piping down stream of filter shall be series 300 Stainless Steel. Mercapton/THT dosing is envisaged hence all materials coming in contact with gas shall be compatible to such gas with Mercapton dosing and be of compressor manufacturer's standard. The use of SA 515 material is prohibited.

All gas piping/ tubing, valves, fittings etc. from Suction of the 1st stage (right from interface) through final discharge from the compressor (up to interface) shall be SS-316 material with double compression ferrule fittings

## 1.8 PRESSURE VESSELS:

All pressure vessels shall be designed as per ASME VIII Div 1 or equivalent with 3 mm corrosion allowance and shall be fully (100%) radio-graphed as per ASME VIII-UW (a) or equivalent.

## 1.9 INSPECTION AND TESTING

### 1.9.1 General

- Inspection and Test Requirements shall be as per approved QAP.
- Bidder shall confirm compliance to all inspection and testing requirements stipulated therein and included the inspection charges in the lump sum cost.

- All Inspection and testing shall be witnessed by Third Party Inspection Agency at the bidder's cost. Approved Third Party Inspection Agencies are Bureau Veritas Industrial Services (BVIS), Lloyds Register of Shipping (LRIS), SGS or DNV.

- Client/PMC may witness tests as per data sheet and this specification. The bidder shall notify the timing of such inspection and testing at least 15 days in advance to Client/PMC. Client may depute their representative for witnessing the tests.

- Bidder shall submit detailed Test Procedure for Approval of the Purchaser/PMC one months in advance of the actual date of conducting each test.

**1.9.2 Mechanical running test (MRT)**

The MRT for each compressor shall be carried out in presence of Purchaser or their representatives along with third party as arranged by Vendor with job or shop driver including complete job driving system for 4 hours continuously at shop of compressor manufacturer. The compressor need not be pressure loaded for MRT test. During this test following shall be recorded at agreed intervals.

Vibration levels measured on cylinders and frame
- Oil cooler inlet and outlet temp

- Electric Current of each drive

Bidder shall submit test procedure for approval. Dispatch clearance shall be given after reviewing all test certificates/documents and completeness of the equipment.

**1.9.3 PACKAGE PERFORMANCE TEST**

Bidder shall assemble the complete package including auxiliary systems, instrumentation, safety devices within the enclosure at his shop/site and dispatch. The machine shall be accepted after the performance test at site. The performance test will be conducted by bidder within three (03) months of successful commissioning of compressor. Complete package shall be performance tested as a module along with electric motor & compressor performance Bidder shall demonstrate all controls, shutdown, trips / alarms etc.

The test shall be the basis of acceptance / rejection of the package thereon. Bidder shall submit the detail test procedure for the same, which shall be approved by PURCHASER. The test for the package shall be witnessed by PURCHASER or their representatives. All guaranteed and other critical parameters shall be demonstrated by the Bidder. In PG test minimum following shall be recorded.
- Compressor capacity average
- Sound level
- Vibration levels measured on cylinders and frame
- Bearing Temp
- Oil cooler inlet and outlet temp
- Electric current of each drive.
- Power consumption
- Gas suction and discharge pressure, temperatures.
- PLC functional test (Ensure all physical connections to sensors, actuators, and other devices are properly made &

Software Setup: Verify that the PLC programming software is installed and functioning correctly)

Bidder shall arrange a Mass flow meter at Discharge of Compressor package to measure the flow for

Performance Guarantee test. Duration of test shall be approximately 4 hours which may be in steps in consultation with purchaser.

Formal Test procedure shall be submitted for approval of the purchaser before conducting the test.

### 1.9.4. WARRANTY

1Bidder shall warrant all material and equipment free from defects in design, material and workmanship.
2.Bidder shall warrant all compressor packages will satisfy the requirements of the intended use and appropriate for application.
3.Repair / replace any equipment / item which prove to be defective, free of cost.
4.Assume responsibility for obtaining manufacturer's warranty of all bought out items.
5.Free of cost replacement of any part found not performing to the specified requirements for at least 18 months from date of delivery or 12 months from the date of successful commissioning. The parts replaced during the warranty period shall have to perform, to the specified requirements for 12 months from the date of replacement or else shall be replaced free of cost. In case of any failure of major components (insurance components), then the complete compressor package shall have the warranty period of 12 months from the date of replacement.
6.Supplier shall guarantee that oil carryover in the CNG from lubricated compressor discharge is less than 5 ppm (at gas temperature less than 50ºC) before flowing into cascades/dispensers.

### 1.9.5. SPARES

1.Bidder shall provide necessary spares and consumables required for startup and commissioning, free of cost to BGL and shall furnish the list of such spares per compressor package in the technical bid.
2.Bidders shall provide list of all spares with their part number of compressor package offered.

### 1.9.6 SPARE PARTS, SPECIAL TOOLS AND TACKLES

All spare parts, special tools & tackles for erection and commissioning shall be supplied and shall form his scope of supply.

A brand-new Separate set of special tools and tackles along with Tool Box as required for Normal operation and maintenance shall be supplied by the bidder without any additional expenses to Purchaser, which shall form the property of Purchaser. Bidder shall submit a list of all such tools and tackles with the unpriced bid.

## 1.10 DOCUMENTS/DATA REQUIRED ALONG WITH BID

Bidder shall necessarily furnish the following along with the bid without which the offer shall be considered incomplete:

1.Completely filled in Data Sheets of Compressor, Electric motors
2.Process and instrument diagram along with Bill of Material. The Bill of Material shall indicate all items, quantity of all items installed per compressor package, their part nos. and make.
3.General arrangement drawing of the compressor package and control panel giving overall dimensions and erection / shipping weight.
4.Technical data sheet of booster compressor and electric motor (both main & fan motor).
5Flow v/s suction pressure and power v/s suction pressure graph or full range suction pressure I.e. 30 to 200 kg/cm2
6.Gas, water, lube oil, piping and instrument diagram.
7.Torque speed characteristic of motors.
8List of commissioning spares per compressor package.
9.List of special tools & Tackles for installation & maintenance per compressor package.
10.List of major bought out items (shall include name of sub vendor, make, model nos. of items) as per table VIII

11.Leaflets, catalogues for all major items.
12Performance curves as per clause 2.6 (c)
13.Maintenance schedule of the compressor package along with list of Spares for Maintenance
14.Electrical single line diagram.
15.P&ID of priority panel.
16.Start up and shut down write up along with operation philosophy.
17.Start up and shut down interlock diagram.
18.Duly filled compressor data sheet, as per table IV.
19.Reference list of similar / identical compressor package supplied in last 7 years of CNG application.
20.Deviation sheet as per Table XI
21.Training schedule with contents.
22.Tentative Layout/ key plan/ General Arrangement indicating size of the skids, Centre distance between skid & space required along with maintenance requirements.
23.Checklist duly filled in with regards to scope of supply
24.Proven track record format duly filled in
25.Utilities requirements
26.Electrical Load summary
27.Catalogues of compressor, electric motor, instrumentation items, etc.

**1.10.1 Within 2 weeks from date LOI / P.O.**

1.Detailed project schedule preferably in MS project giving all activities such as Design and review, Major bought out items (such as Motors, Control panels, Intercoolers, Compressor block castings, frame etc.), Machining of components / castings, Sub-assemblies, Stage inspection, Acoustic enclosure assembly, Final Assembly, Final shop testing of machines, Final inspection, dispatch etc.
2.General arrangement drawing of the compressor package, giving overall dimension and erection / shipping weight.
3.P & ID for gas, oil, water and other circuits.
4.GA drawing, foundation details of the filter assembly including anchoring/grouting, load details, with exploded view drawings shall be provided.
5.Electrical Single Line Diagram along with control philosophy
6.Detailed foundation plan drawing of the compressor package, for casting foundation giving load pattern etc.
7.Detailed Civil foundation drawing with grouting/anchoring required if any for proper installation of CO2 cylinders shall be given for casting foundation along with load details.
8.Details of inlet gas termination including X, Y, Z co-ordinates with respect to center of compressor skid or any reference.
9.Detailed specification of lubricating oil such as kinematic viscosity, flash point, viscosity index etc and quantity of lube oil required for commissioning of each compressor package.
10.Typical cross-sectional drawing and literature to fully describe the details of all major components such as Compressor, Motor, Suction valve, Discharge valve, Piston rod gland packing, Piston rings, Coupling, Lube oil pump, intercoolers etc.
11.Shop test procedure.

**10.1.2 Along with supply.**

1.Operation and maintenance manuals – 3 sets all in original for each compressor package (both in hard and soft form). The instruction manual shall describe in detail the construction and recommended procedure for installation, maintaining, operating and troubleshooting of the compressor shall also include cross-sectional drawings, exploded views of all spare parts, brought out items, instrumentation along with part nos., quantity installed per machine. The manual shall provide detailed catalogs of all bought out items.
2.Mechanical & electrical installation drawing including interconnection and wiring diagram. Type test certificates for cables. Tube light, junction Box and other electrical equipment's hazardous area classification certificates.
Main motor & cooling fan Motor hazardous area classification, routine test
and IP certificate. Compressor panel hazardous area classification, routine test, IP certificate and CCoE Approval.
3.Material, Fabrication, Final Inspection Test certificates, of all major components like compressor

frame, mass flow meter, inter stage tubing / piping, intercoolers, motors, oil pump, water pump, control panel, suction/discharge valves, PLC, gas detectors, flame detector, fittings, pressure vessels like blow down vessel, Inter stage condenser bottles, suction filters etc. Casting material & hydro test certificates of all the casted materials and pressure vessels.
4.Calibration certificates for all measuring and protection devices. Test records of mechanical running, performance test and noise level test.
5.Certificates from statutory authorities confirming suitability of design / construction of all electrical and electronic items for use in hazardous area classification. In case of foreign supply, the bidder shall get all certificates endorsed by office of Chief Controller of Explosives (CCOE), Govt of India within one month of delivery of compressors at site.
6.Complete bill of material of component along with assembly/ dis-assembly drawings.
7.Wear and clearance charts with limits, vibration limits, torque value of all components for assembly/ dis- assembly.
8.All the final drawings shall also be given in digitized form on CD ROM compatible to Auto Cad software.
9.Bidder has to provide the PESO certificate for the compressor package.

Any other document required over and above aforesaid documents during engineering stage after placement of order shall be supplied by bidder. Bidder shall also supply above data in editable soft copy.

## Section VII: QUALITY ASSURANCE PLAN

**QUALITY ASSURANCE PLAN – CNG BOOSTER COMPRESSOR**

| Sl .No | OPERARATION / PARAMETER | VENDOR | TPAI | CA | REMARKS |
|---|---|---|---|---|---|
| 1 | HYDROTEST OF – CYLINDER, PRESSURTE VESSELS, HEATEXCHANGER | P | W/R | R | |
| 2 | HYDROTEST OF - CYLINDER HEADS | P | W/R | R | |
| 3 | LEAK PROOF TEST OF CRANK CASE (4 Hours. with Kerosene) | | | | |
| 4 | ULTRASONIC TEST OF CRANK SHAFT, CONNECTING ROD,PISTON ROD | P | R | R | |
| 5 | MAGNETIC PARTICLE TEST OF - CRANK SHAFT,CONNECTING ROD, PISTON ROD | P | R | R | |
| 6 | RADIOGRAPHY AS APPLICABLE - PRESSURE VESSELS, HEAT EXCHANGER. GAS PIPING (only 10% joints to bewitnessed) | P | R | R | |
| 7 | BARRING OVER TO CHECK CYLINDER END CLEARANCEAND PISTON ROD RUNOUT | P | R | R | |
| 8 | NO LOAD MECHANICAL RUN TEST OF THE COMPR. WITH RATED (OR MORE) SPEED AND SHOP DRIVER. (4HRS. Min.) | P | W | R | |
| 9 | STRIP CHECK AND INTERNAL INSPECTION AFTER "NLMRT"OF ALL COMPRESSORS | P | W | R | |

| | | | | | |
|---|---|---|---|---|---|
| 10 | ELECTRIC MOTOR PERFORMANCE TEST- AT SUB-VENDOR'S WORKS PER ISO STD. | P | W/R | R | |
| 11 | MATERIAL TEST CERTIFICATES FOR: CRANK SHAFT, CONNECTING RODS, CYLINDER. LINER,PISTON (COMPLIANCE CERT.), PRESSURE | P | R | R | |
| 12 | CANOPY STRUCTURE PAINTING INSPECTION AT WORKS. SURFACE PREPARATION TO BE INSPECTEDAFTER CLEANING AND BEFORE APPLICATION OF FIRST COAT OF PRIMER. | P | W | R | |
| 13 | FUNCTIONAL / HV / CONTINUTY TEST FOR CONTROLPANEL ( AT SUB VENDOR'S WORKS) | P | W/R | R | |
| 14 | MECHANICAL STRING TEST FOR 4 HOURS FOR EACH CNGCOMPRESSOR PACKAGES | P | R | W/ R | |
| 15 | TEST CERTIFICATES FOR - SAFETY SWITCHES, SAFETYRELIEF VALVES, SOLENOID VALVES, GD & FD, CO2 cylinders, Motors. | R | R | R | |
| 16 | FINAL MOCK-UP ASSEMBLY OF THE PACKAGE - AS PERGAFD, P& I DRAWINGS. WIRING DIAGRAM | P | R | R | |
| 17 | PERFORMANCE TEST AT SITE AT GUARANTEED PARAMETERS. | P | W | W | |
| 18 | FIELD TRIAL RUN FOR 72 HRS. | P | W | W | |

LEGENDS: W= witness; H=Hold; M=Monitoring; P=Perform; R=Review of documents; R/M=Random Check; A=Approved; TPAI=Third Party Inspection Agency CA- client acceptance

## Section VIII: VENDOR DRAWING AND DATA REQUIREMENTS

| S. No. | DESCRIPTION | To be submitted with Bid | To be submitted for Approval | | To be submitted for Shipment | | Submit as certified Final / As Built | |
|---|---|---|---|---|---|---|---|---|
| | | | Required | Days after PO | Required | Days after PO | Required | Days after PO |
| A. | **GENERAL.** | | | | | | | |
| 1. | PROJECT SCHEDULE | ✓ | ✓ | | | | | |
| 2. | DULY FILLED-IN "CHECKLIST FORCOMPLETENESS OF BID" | ✓ | | | | | | |
| 3. | DULY FILLED-IN "CHECKLIST FORSCOPE OF SUPPLY" | ✓ | | | | | | |
| 4. | DEVIATION LIST (IF ANY) TO THE APPLICABLE SPEC., DATASHEETS | ✓ | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5. | UTILITIES REQUIREMENT SUMMARY | ✓ | ✓ | | | | ✓ | |
| 6. | FLANGE DETAILS OF PIPING CONNECTION WITH CONNECTION AT BATTERY LIMIT | ✓ | ✓ | | | | ✓ | |
| 7. | DULY FILLED IN EXPERIENCERECORD PROFORMA | ✓ | | | | | | |
| 8. | GUARANTEE PARAMETERS AS SPECIFIED | ✓ | ✓ | | | | ✓ | |
| 9. | TENTATIVE LOAD DATA FOR FOUNDATION DESIGN | ✓ | ✓ | | | | ✓ | |
| 10. | LIST OF SUB-VENDORS FOR ALL BOUGHT OUT ITEMS INCLUDING ELECTRICAL & INSTRUMENTATIONITEMS | | ✓ | | | | ✓ | |
| 11. | LEAFLET, CATALOGUES FOR ALLITEMS | ✓ | ✓ | | | | ✓ | |
| 12. | O & M MANUAL | ✓ | ✓ | | ✓ | | ✓ | |
| B. | **COMPRESSOR** | | | | | | | |
| 1 | DATASHEETS FOR THE FOLLOWING | | | | | | | |
| A | COMPRESSOR | ✓ | ✓ | | | | ✓ | |
| B | HEAT EXCHANGERS | | ✓ | | | | ✓ | |
| C | PRESSURE VESSELS | | ✓ | | ✓ | | ✓ | |
| D | ELECTRIC MOTOR | | ✓ | | | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | CATALOGUE FOR COMPRESSOR | ✓ | ✓ | | | | | |
| 3 | **TYPICAL CROSS-SECTIONAL DRAWING AND LITERATURE TO FULLY DESCRIBE THE DETAILS OF OFFERING** | | | | | | | |
| A | COMPRESSOR | ✓ | ✓ | | | | | |
| B | SUCTION VALVE | ✓ | ✓ | | | | | |
| C | DISCHARGE VALVE | ✓ | ✓ | | | | | |
| D | PISTON ROD GLAND PACKING &PISTON RINGS | ✓ | ✓ | | | | | |
| E | LUBE OIL PUMP | ✓ | ✓ | | | | | |
| 4 | V-BELT & PULLEY WITH SELECTIONCHART & CALCULATION | | ✓ | | ✓ | | ✓ | |
| 5 | COOLER DATA / DRG WITH THERMAL & MECH DESIGN CALCULATION | | ✓ | | ✓ | | ✓ | |
| 6 | DESIGN CALCULATION, GA DRGSFOR PULSATION DAMPNER | | ✓ | | ✓ | | ✓ | |
| 7 | **PIPING & INSTRUMENTATION DIAGRAMS FOR THE FOLLOWING** | | | | | | | |
| A | PROCESS GAS | | ✓ | | | | ✓ | |
| B | LUBE OIL | | ✓ | | | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| C | COOLING WATER | | ✓ | | | | ✓ | |
| 8 | TORQUE ANGLE DIAGRAM, PISTONROD LOAD VS CRANK ANGLE | | ✓ | | | | ✓ | |
| 9 | TORQUE SPEED CHARACTERISTICS | | ✓ | | | | ✓ | |
| 10 | ACOUSTIC / MECHANICAL EVALUATION REPORT | | ✓ | | | | ✓ | |
| 11 | ITEMISED PRICE LIST OF MANDATORY SPARES WITH THREEYEAR VALIDITY | ✓ | | | ✓ | | ✓ | |
| 12. | DRG. FOR TESTING ARRANGEMENT & TEST PROCEDURE TO BE ADOPTED | | | | | | ✓ | |
| 13. | **CERTIFICATE FOR FOLLOWING:** | | | | | | | |
| A | HYDRAULIC TESTING | | | | ✓ | | ✓ | |
| B | NON-DESTRUCTIVE TESTING | | | | ✓ | | ✓ | |
| C | MATERIAL COMPOSITION &PHYSICAL PROPERTIES | | | | ✓ | | ✓ | |
| D | LEAK PROOFNESS TEST OF FRAME | | | | ✓ | | ✓ | |
| E | LUBE PUMP, FRAME OIL PUMP, HYDOIL PUMP | | | | ✓ | | ✓ | |
| 14 | DESIGN / ACTUALASSEMBLY CLEARANCE CHART | | | | ✓ | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 15 | TEST RECORDS OF FOLLOWING | | | | ✓ | | ✓ | |
| A | MECHANICAL RUNNING | | | | ✓ | | ✓ | |
| B | PERFORMANCE TEST / PACKAGETEST | | | | ✓ | | ✓ | |
| C | NOISE LEVEL TEST | | | | ✓ | | ✓ | |
| 16 | LIST OF SPECIAL TOOLS & TACKLES FOR INSTALLATION & MAINTENANCE | | | | ✓ | | ✓ | |
| C | **ELECTRIC MOTOR** | | | | | | | |
| 1 | MOTOR DATA SHEET | | ✓ | | | | ✓ | |
| 2 | TECHNICAL LITERATURE / CATALOGUE, SELECTION CHARTS, NOMOGRAPHS ETC. | | ✓ | | | | ✓ | |
| 3 | GA DRAWING | | ✓ | | | | ✓ | |
| 4 | TERMINAL BOX ARRANGEMENTDRAWING | | ✓ | | | | ✓ | |
| 5 | MOTOR CHARACTERISTIC CURVES | | ✓ | | | | ✓ | |
| 6 | TORQUE SPEED CURVES | | ✓ | | | | ✓ | |
| 7 | CURRENT TIME CURVES | | ✓ | | | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | P.F AND EFFICIENCY | | ✓ | | | | ✓ | |
| 9 | TYPE TEST CERTIFICATES | | | | | | ✓ | |
| 10 | Certificate from the relevant statutory authority (based on the country of manufacture) for suitability of the offered motor for installation in the specifiedarea classification | | | | | | ✓ | |
| 11 | Pre-commissioning and Commissioning procedure | | ✓ | | | | ✓ | |
| D | **INSTRUMENTATION** | | | | | | | |
| 1 | G.A. OF INSTRUMENT PANEL WITH BILL OF MATERIAL & WIRING DIG. FOR LCP | | ✓ | | | | ✓ | |
| 2 | INSTRUMENT DATASHEET | | ✓ | | | | ✓ | |
| 3 | LOGIC DIAGRAM / LADDER DIAGRAM / FUNCTIONAL DIAGRAM | | ✓ | | | | ✓ | |
| 4 | **LOOP SCHEMATIC** | | | | | | | |
| 5 | INTERCONNECTING DIAGRAM | | ✓ | | | | ✓ | |
| 6 | OPERATING / CONTROL WRITE UP | | ✓ | | | | ✓ | |
| 7 | ALARM / SHUT DOWN LIST7 | | ✓ | | | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | WIRING DIAGRAM / INTERCONNECTING PIPING | | ✓ | | | | ✓ | |
| 9 | START UP AND SHUT DOWN WRITEUP | | ✓ | | | | ✓ | |
| 10 | START UP AND SHUT DOWN INLETLOCK DIAGRAM | | ✓ | | | | ✓ | |
| 11 | ALARM AND SHUTDOWN LISTWITH SET POINT | | ✓ | | | | ✓ | |
| 12 | LOAD CONTROL PANEL LAYOUT | | ✓ | | | | ✓ | |
| 13 | TERMINATION DIAGRAM, PANELWIRING DETAIL | | ✓ | | | | ✓ | |
| 14 | LOOP SCHEMATIC | | ✓ | | | | ✓ | |
| 15. | INTERCONNECTING DIAGRAM | | ✓ | | | | ✓ | |
| 16. | CABLE SCHEMATIC | | ✓ | | | | ✓ | |
| 17. | BILL OF MATERIAL | | ✓ | | | | ✓ | |
| 18. | TEST / INSPECTION CERTIFICATE | | ✓ | | | | ✓ | |
| 19. | LIST OF RELIEF VALVES WITH SETTINGS | | ✓ | | | | ✓ | |
| 20. | Certificate from the relevant statutory authority (based on the country of manufacture) for suitability of theoffered instruments for installation in | | ✓ | | | | ✓ | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | the | | | | | | | |

**Section IX: CHECKLIST – TECHNICAL**

Bidder confirms following, as a minimum, has been enclosed in the offer

| S.NO. | Requirements | Compiled by Bidder (Tick) |
|---|---|---|
| 1 | Reference List of previous supply of Procured item | |
| 2 | Filled – up Data Sheets, duly signed and stamped by bidder enclosed. | |
| 3 | List of Mandatory spare with quantity and price having validity of 03(three) years | |
| 4 | Compliance statement duly filled and stamped enclosed. | |
| 5 | GA & assembly drawings, cross section drawings including part list & material list enclosed. | |
| 6 | Other technical details & vendor's product catalogues enclosed. | |

**Section X: COMPLIANCE STATEMENT**

| S.No | Requirement | Bidder's Confirmation |
|---|---|---|
| 1 | Bidder confirms that all materials proposed by the bidder are same/ superior to those specified in specification/ data sheets enclosed. | |
| 2 | Bidder confirms that the offer is in total compliance with the Technical requirements of the Material Requisition. Bidder confirms that deviation expressed or implied anywhere else in the offer shall not be considered valid. | |

| | | |
|---|---|---|
| 3 | Bidder confirms that List of Mandatory spare with quantity have been quoted with validity of 03 (three) years separately. | |
| 4 | Bidder confirms that prices for start-up/commissioning spares and accessories have been included in the quoted items. | |
| 5 | Bidder confirms that in the event of securing order for the requisitioned item(s), good for manufacturing drawings of ordered item(s) shall have complete details with dimensions, part list and material list including back-up calculations in the first submission, failing which the vendor shall be solely responsible for any likely delay in delivery of item(s). | |

**Section XI: DEVIATION/ EXCEPTION/ CLARIFICATION SHEET**

| Sr. No. | Contractor's Inquiry Reference | Contractor's Requirement | Proposed Deviation by Supplier, with Technical Justification | Cost Impact ifany | Contractor's Conclusions |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

**NOTES**

1- Bidder confirms that apart of from the deviations/exceptions/clarifications listed above, the bid is in full compliance with Inquiry requisition.

2- Bidder shall submit this sheet duly filled up and signed by him along with his bid. In case there is no deviation, then also supplier shall submit this sheet along with his bid indicating NIL deviation.

**Section XII: INFORMATION/ DOCUMENTS / DRAWINGS TO BE SUBMITTED BY SUCCESSFUL BIDDER**

Successful Bidder shall submit four copies unless noted otherwise, each of the following:

1. Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests, in nicely bound volumes.

2. Filled in Quality Assurance Plan (QAP) for Purchaser's/ Consultant's approval. These QAPs shall be submitted in two copies within 10 days from LOI/ FOI.

3. Detailed completion schedule activity wise (Bar Chart), within one week of placement of order.

Note : All drawings, instructions, catalogues, etc., shall be in English language and all dimensions shall be metric units.

**Section XIII: INSTRUCTION TO BIDDERS**

1. Bidder to note that no correspondence shall be entered into or entertained after the bid submission.

2. Bidder shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheet forming part of Material Requisition.

3. 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.

4. Bidder must submit all documents as listed in checklist with his offer.

5. Supplier must note that stage wise inspection for complete fabrication, testing including the raw material inspected to be carried out.

6. Vendors for bought out items to be restricted to the approved vendor list attached with bid document. Approval of additional vendor if required, for all critical bought out items shall be obtained by the supplier from the purchaser before placement of order. Credentials/PTR of the additional vendor proposed to be submitted by supplier for review and approval of Purchaser/ Purchaser's representative

**Section XIV: REFERENCE LIST**

| Sl. No. | Project | Year of Supply | Client, Address and Contact No. | Email | Size and Rating/Thk | Service |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## Section XV: LIST OF SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS

**1. Mass flow meter**

a. Micromotion CNG 50

b. Endress + Hauser (E&H)

**2. Pressure Transmitter**

a. Druck

b. Wika

c. Honeywell

d. ABB

e. Rosmount

**3. Pressure Regulator & slam shut valve**

a. M/s Pietro Fiorentini S.p.A (Italy)

b. M/s Emerson Process Management

c. M/s RMG Regel Messtechnik (Germany)

d. M/s Mokved Valves BY (Netherlands)

e. M/s Tartarini

f. M/s Fisher
g. M/s Gorter controls (Netherlands)
h. M/s Dresser

**4. Pressure Safety Valve**

a. M/s BHEL, OFE & OE Group (New Delhi)/
b. M/s Keystone Valves (India) Pvt. Ltd. Baroda
c. M/s Sebim Sarasin Valves India (P) Ltd. (New Delhi-Halol-Gujarat)
d. M/s Tyco Sanmar Ltd. (New Delhi)
e. M/s Parcol SPA, Italy
f. M/s Sarasin, France
g. M/s Tai Milano SPA, Italy
h. M/s Fisher Rosemount (Now M/s Emerson Process)
i. M.s. DK-LOk
j. M/s. Faiger Leser

**5. Pressure Gauges & temperature Gauges**

a. M/s AN Instruments Pvt. Ltd., New Delhi
b. M/s Altop
c. M/s General Instruments Ltd., Mumbai
d. M/s WIKA,

**6. RTD**

a. M/s General Instruments Ltd. Mumbai
b. M/s Nagman Sensors (Pvt.) Ltd.
c. M/s Pyro Electric, Goa
d. M/s Altop

**7. Soft starter**

a. Siemens
b. ABB
c. Rockwell
d. Schneider

**8. FLP Motors**

a. ABB
b. Compton Greaves
c. Kirloskar
d. Siemens
e. Bharat Bijlee
f. LHP

**9. FLP Switchgear**

a. Baliga
b. FCG
c. FPE
d. Flexpro
e. Sudhir

**10. Switches/Fuses/Contractors**

a. L & T
b. GEC
c. Siemens
d. Schneider

**11. MCCB**

a. Siemens
b. Legrand
c. Schneider

**12. Vibration Switch**

a. Robershaw control
b. Murphy

**13. PLC**

a. Rockwell Automation
b. GE Fanuc
c. Siemens
d. Allen Bradley
e. Telemechnique
f. Schneider

**14. Push Button**

a. L&T
b. Vaishno

**15. IR Gas Detectors**

a. General Monitors
b. Crowcon
c. Honeywell
d. Sieger
e. Detronics

f. Khrome Schroder
g. Net safety.
h. ESP Safety
i. Ambetronics
j. Drager Safety

**16. UV Flame Detectors**

a. General Monitors
b. Crowcon
c. Honeywell
d. Sieger
e. Detronics
f. Khrome Schroder
g. Net safety.
h. ESP Safety
i. Ambetronics

**17. SS Tubes for CNG application**

a. M/s Sandvik, Sweden
b. M/s Tubacex
c. M/s. BMT Superlock
d. Jindal Saw

**18. SS Fittings for CNG application**

a. M/s Swagelok (USA)
b. M/s Parker (USA)
c. M/s SSP, USA
d. M/s. Dk LOK

**19. Solenoid Valve**

a. M/s ASCO
b. M/s Rotex
c. M/s Parker Hanifen

**20. On Off ball/needle valve for CNG application**

a. M/s Parker
b. M/s Swagelok
c. M/s SSP, USA
d. M/s. Dk LOK

**21. Cables and wires**

a. INCAB/ Universal

b. ASEAN/CCI
c. FORT Gloster
d. Finolex
e. KEI Associated Cables
f. Polycab

**22. Barrier/isolators/surge protector**

a. MTL
b. Phoenix
c. P&F

23. Air exchanger

a. GEI Hamon Ind Ltd.
b. GEA India
c. Patel Air temp

**24. Thermoplastic Hoses for CNG Application**

a. M/s Parker
b. M/s Swagelok
c. ZEC Italy
d. ETON

# SPECIAL CONDITIONS OF CONTRACT (SCC)

## SPECIAL CONDITIONS OF THE CONTRACT (SCC)

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.

### 1.0 DEFINITIONS

The Purchaser is: (C&P Department), Bhagyanagar gas Limited having their office at 2nd floor TSIDC buildings, Parishrma bhavan, Basheerbagh, Hyderabad-500004

FOT shall mean sum of Ex-works price including packing and forwarding, TPIA, GST, Transit insurance, transportation, and unloading at site.

### 2.0 PRICE REDUCTION SCHEDULE (PRS)

In case supplier fails to complete the supply within stipulated period then unless such failure is due to force majeure as defined in Bid document, there will be reduction in order value @ 0.5% of the total order value for every week or part thereof of the delay, subject to maximum of 5% of the total order value. Owner may without prejudice to any methods of recovery, deduct the amount of such PRS from any money due or which may at any time become due to supplier from its obligations or liabilities under the contract or by recovery against the performance bank guarantee. Both owner and supplier agree that the above percentage of price reduction are genuine pre-estimates of the loss/ damage which Owner would have suffered on account of delay/ breach on the part of supplier and the said amount will be payable on demand without there being any proof of the actual loss/ damage caused by such delay/ breach. Owner decision in the matter of applicability of price reduction shall be final and binding.

Value considered for PRS as per above clause shall be excluding taxes and duties.

All sums payable by way of compensation shall be considered as reasonable compensation without reference to the actual loss or damage which shall have been sustained.

### 3.0 DELIVERY AND DOCUMENTS

Bidder to note that delivery shall be as per followings:

**For Part -A:** The basis of delivery for all items shall be FOT, BGL Site/OMC site/ Store at Hyderabad GA

**For Part -B**: The basis of delivery for all items shall be FOT, BGL site at Vijayawada/ Kakinada GA

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:

(a) LR or GR
(b) Packing List showing weight and dimension of each package
(c) Manufacturer's factory inspection complying the technical specification as per tender.
(d) Inspection release note issued by Purchaser/ Consultant/ TPIA
(e) Cargo Insurance
(f) Dispatch clearance issued by Purchaser/ Consultant.

(g) Likely date of arrival.
(h) 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 BGL, Hyderabad Head Office and transport copy shall be submitted at the time of delivery at BGL designated store/ office.

**4.0 SHIPMENT**

The Bidder shall make shipment only after obtaining dispatch clearance from Purchaser. For getting dispatch clearance, bidder has to submit inspection release note issued by Third Party Inspection agency/ Purchaser‟s authorized representative to the Purchaser.
The bidder shall provide details of adequate coverage of transit insurance along with dispatch documents.

**5.0 PAYMENT TERMS**

**PAYMENT TERMS & MODE OF PAYMENT**
**[APPENDIX – I TO SPECIAL CONDITION OF CONTRACT]**
**PAYMENT TERMS & MODE OF PAYMENT**
**1. PAYMENT TERMS**
**A. Supply Portion**
i. 85 % of the total supply order price (per compressor package) will be paid against receipt of ordered item(s) by
Owner at site upon receipt and acceptance of bills at site against relevant documents as mentioned in order,
payment will be through e-banking (in case of Domestic bidder)
**Document Requirement**
a. Inspection release note by issued by inspection Agency appointed by owner / consultant.
b. GR / LR.
c. Packing List
d. Insurance cover note covering transit insurance
e. Dispatch Clearance by Owner / Consultant.
f. Documents as specified in the Technical Specifications.
g. Copy of valid Performance Bank Guarantee as per tender terms & conditions
h. Invoice in triplicate (as per GST Act/ Rules)
i. A certificate from manufacturer that the 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.
j. Indemnity Bond
ii. 15 % of the total supply order price (per compressor package) will be paid within 30 days of successful completion of Installation, Testing, Commissioning and Field Performance test (4 hours) and Field trial run(72 hour) at site and acceptance thereof by Owner and submission of all technical documents as per tender requirement.
However, if erection is not started within 120 days after supply due to non-availability of site / gas, balance payment of 15% of the total supply part shall be processed for release to the successful bidder. In case of delay in receipt of material at site the invoice value shall be reduced to take care of stipulation of PRS clause of the contract.
iii. 100% Payment against extra visit, due to reasons not attributable to the vendor, for Commissioning activities of SOR item shall be processed based on certification from site in-charge.
iv. 100% payment against loading from stores, re-transportation from stores to unloading at site shall be processed based on certification from site in-charge

**B. Payment for Installation and Commissioning/Field Performance Test**
100% payment towards Erection and Commissioning / Field Performance Test shall be payable within 30
working days of the completion of the said respective activities on certification by Engineer-In-Charge.
**C. Payment for Maintenance**
Monthly Maintenance charges shall be payable from the date of compressors are taken under
commercial operation by CLIENT after submission of PBG as per tender terms & conditions.
**D. General Notes**
i. Invoice shall be raised on the basis of not less than one fortnight interval.
ii. PRS amount pertaining to supply part shall be deducted from 85% of the total supply order price to be
paid against Sl. no. i) of Payment Terms.
iii. All efforts shall be made to release the payment within 30 days after receipt of relevant documents
complete in all respects.
iv. All bank charges incurred in connection with payments shall be to vendor‟s accounts.
v. Unless otherwise specifically stated in bid document, all payments shall be made in the currency
quoted.
vi. No interest charges for delay in payments, if any, shall be payable by Owner.

vii. Bidder shall ensure payment of minimum wages, as per Central Govt. or respective State Govt.,
whichever is higher, to its people engaged in the site activities/ AMC.
viii. Penalty/ deductions for non-performance, if any, shall be applicable as per provisions stipulated
in Technical volume (Vol.-II).
ix. The rates quoted for Annual comprehensive repair & Maintenance shall be inclusive of cost of relievers,
fulfillment of statutory compliances and meet all the contractual obligation as defined in the bid
document.

**Comprehensive Annual Comprehensive Servicing, Repair & maintenance charges after successful completion of Warranty Period**

Monthly comprehensive maintenance charges shall be paid on pro-rata monthly basis, within 30 days on receipt of correct invoices duly certified by Engineer In-Charge.

## 6.0 DISPATCH INSTRUCTIONS

Seller shall obtain dispatch clearance from the Purchaser prior to each dispatch.
Copy of Inspection Release Certificate, Dispatch Clearance and Statement showing the name of the vessel / transporter, description and weight of material and shipping marks etc. to be submitted along with the documents.

## 7.0 REJECTION

Any materials/goods covered under scope of supply, which during the process of inspection by appointed third party, at any stage of manufacture/fabrication and subsequent stages, prior to dispatch is found not conforming to the requirements/specifications of the Purchase Requisition/Order, shall be liable for immediate rejection.
Supplier shall be responsible and liable for immediate replacement of such material with acceptable material at no extra cost or impact on the delivery schedule to OWNER.

## 8.0 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 damages, loss of profits or loss of production.

## 9.0 QUALITY ASSURANCE/QUALITY CONTROL

The Bidder shall prepare a detailed quality assurance plan for the execution of Contract for the various supplies for approval of BGL/ BGL PMC Consultant.
The Bidder shall establish document and maintain an effective quality assurance system outlined in recognized codes.
The Purchaser, while agreeing to a quality assurance plan shall mark the stages for witness of Tests, review at any or all stages of work at shop/site as deemed necessary for quality assurance.

**10.0 INSPECTIONS AND TESTS**

Inspection and tests prior to shipment of Goods and at final acceptance shall be as per Technical Specifications, Quality Control Table and approved Inspection & Test Procedure. However, without prejudice to the provisions of technical specifications following shall hold good:
The Purchaser or its representative shall have the right to inspect and/ or to test the material to confirm their conformity to the specifications.
The inspections and tests may be conducted on the premises of the Seller or his subcontractor
(s) at point of Delivery and/or at the destination. When conducted on the premises of the Seller or his subcontractor(s), all reasonable facilities and assistance including access to the production data shall be furnished to the Purchaser's representatives at no charge to the Purchaser.
The Purchaser's right to inspect, test and wherever necessary reject the material after the material‟s arrival in the Purchaser‟s country shall in no way be limited to or waived by reason of the material having previously been inspected, tested and passed by the Purchaser or their representative prior to the material shipment from the country of origin.
Supplier shall hire Third Party Inspection Agency (TPIA) for carrying out the inspection at supplier‟s works as per approved ITP. TPIA charges shall be borne by Supplier. Approved TPIA are Moody International (India) Pvt. Ltd., Dr. Amin Controllers Pvt. Ltd., Certification Engineers International Ltd., International Certification Service Pvt. Ltd., Bureau Veritas (India) Pvt. Ltd., Hertz Inspection & Services Pvt. Ltd., Meenar Global Consultant, Quality Evaluation and Systems Team Pvt. Ltd. TUV SUD South Asia, Vincotte International India Assessment Service Pvt. Ltd., TUV India Pvt. Ltd., SGS India Pvt. Ltd. Supplier shall obtain BGL /BGL‟s Consultant's approval before finalizing the TPIA.

**11.0 REPEAT ORDER**

PURCHASER reserves the right, within 06 months of order to place repeat order upto 50% of the original ordered quantity (s) without any change in unit price or other terms and conditions.

**12.0 MODE OF PAYMENT**

Payment will be released through E-payment as detailed in ITB Taxes & duties (GST) shall be paid in Indian Rupees only. For reimbursement of taxes & duties the currency exchange rate as mentioned in GST Invoice shall be considered.

The payment shall be released within 30 days from the date of receipt of invoice, if found to be in order and duly certified by PMC/EIC.The Payment shall be released through RTGS only.

**13.0 DEDUCTION AT SOURCE**

Purchaser will release the payment to the Seller after effecting deductions as per applicable law in force.

Purchaser will release payments to the Bidder after offsetting all dues to the Purchaser payable by the Bidder under the Contract.

Notes: - All Invoices shall be raised in line with the GST Act/rules in vogue.

**14.0 GUARANTEE/ WARRANTY**

Warranty shall remain valid for twelve (12) months from the date of successful commissioning of supplied material or Eighteen (18) Months after the date of receipt of last shipment whichever is earlier. However, if these 18 months" period exceeds due to any defect observed in the supplied material at site in that case supplier to replace the material without any extra cost to owner and the warranty will stand extended for another 12 months from the date of supply of replaced material.

**15.0 PACKING**

The SCC provisions shall supplement GCC Clause 11.0 as detailed below.

Packing shall be capable of withstanding rough sea weather for a minimum period of 2 to 3 months and shall be commensurate with the best commercial export practice in case of sea freight.

Fragile articles shall be packed with special precaution and shall bear the marking like 'Fragile Handle with Care' and' or 'This side Up' etc. Items shipped in bundle must be securely tied with steel wire or straps at suitable intervals.

All delicate surface on equipment' materials shall be carefully protected and painted with protective paint compound and wrapped to prevent rusting and damage.

Attachments and parts of equipment and small pieces shall be packed in wooden cases with adequate protection inside the case and wherever possible should be sent along with the major equipment. Each item shall be tagged so as to identify it with the main equipment and part number and reference number shall be indicated.

All protrusions shall be suitably protected, and openings shall be blocked by wooden covers. Wherever required, equipment' material shall be packed in polythene bags and silica gel or similar dehydrating compound shall be put inside the bags for protecting them.

**16.0 CONTRACT PERFORMANCE BANK GUARANTEE**

**FOR SUPPLY**: The successful bidder shall furnish the Contract Performance Bank Guarantee (CPBG) equivalent to 10 (Ten) % of the total FOT order value exclusive of taxes & duties within a period of 30 Days from the date of issue of LOI/ Purchase Order. The CPBG should initially be kept valid for 90 days beyond the guarantee / warranty/ defect liability period. The claim period shall be 30 days more than the validity of the CPBG.

**FOR CAMC**: The successful bidder shall furnish the Contract Performance Bank Guarantee (CPBG) equivalent to 7.5% of the Annualized Comprehensive AMC value (excluding all taxes and duties) shall be submitted within 30 Days of start of each comprehensive AMC. The CPBG should be valid for 90 days beyond the expiry of Annual Comprehensive AMC period of one (01) year post guarantee / warranty period/defect liability period.

**17.0 CORRESPONDING ADDRESS PURCHASER:**

C&P Department
Bhagyanagar Gas Limited
2nd floor , TSIDC buildings,
Parishrma Bhavan, Basheerbagh,
Hyderabad-500004

**18.0 CONTRACT VALIDITY AND DELIVERY SCHEDULE**

The Contract shall be valid for a period of 01 (one) year from the date of issuance of LOI/PO.

| Sr.No | Location | Description | Quantity | Delivery schedule |
|---|---|---|---|---|
| 1 | Hyderabad | 400 SCMH Booster Compressor | 05 | Within 02 (Two) months from the date of Purchase order or as instructed by EIC |
| 2 | Vijayawada/Kakinada | 400 SCMH Booster Compressor | 01 | Within 02 (Two) months from the date of Purchase order or as instructed by EIC |

19.0 **Commissioning shall be carried out within 01 (one) week from the date of EIC's intimation, subject to readiness of the site.**

20.0 BGL Intends to operate the booster compressors without operator ensuring package remains in good condition. Therefore, the bidder is required to supply booster compressors that are capable of autonomous operation without the need for operator intervention.

21.0 Bidder has to supply the PLC based machine with Internet of Things (IoT) capabilities to access the data through cloud. Bidder has to consider all necessary requirements for this requirement completely in his scope. Bidder has to provide all necessary requirements for IOT system without any additional expenses to BGL.

22.0 Bank guarantee for O&M shall start from the date of commercial operation by the purchaser which will be 7.5% of total cost of O&M services.

23.0 The installations where job is to carried out are live and have hydrocarbon environment. Bidder shall comply with all safety and security rules and regulations and other rules laid down by purchaser for its operation. It shall be the duty/ responsibility of the bidder to ensure the compliance of fire, safety ,security and other operational rules and regulations by his personnel. Dis regards to these rules by the bidders personnel will lead to the termination of the contract in all respects and shall face penal / legal consequences.

24.0 The bidder shall arrange insurance of all this workers engaged on the job as per the relevant acts, rules and regulations, etc. In case by virtue of provisions of workers compensation Act, or any the law in forces. Purchaser has to pay for compensation for a workman employed by the bidder due to ant cause whatsoever the amount so paid shall be recovered from the dues payable to the bidder and / or security deposit/ Contract performance security guarantee (CPBG).

25.0 BGL shall reserves the right ant any time during the currency of the contract . to terminate it by giving 30 days notice to the bidder, and upon expiry of such notice period the bidder shall vacate the site/office occupied by him immediately.

26.0 The bidder shall ensure and will be solely responsible for payment of wages and other dues latest by 7th of the following month to the personnel deployed by him in the presence of the company's representative.

27.0 The bidder shall be directly responsible for indemnify the company against all charges, claims, dues etc. araising out of disputes relating to the dues and employment of personnel deployed by the bidder.

28.0 The contractor shall maintain the compressors in sound mechanical condition at all times. The contractor shall rectify the defects notified by Client immediately and should submit all the history log sheets and spares availability status along with the report in the format mutually agreed between Client and the bidder.

| SCHEDULE OF RATES (SOR) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SUPPLY OF 400SCMH BOOSTER COMPRESSOR FOR BGL LOCATED IN HYDERABAD & VIJAYAWADA | | | | | | | | | | | |
| Name Of Bidder | | | | | | | | | | | |
| Address/Contact No./Email of the Firm | | | | | | | | | | | |
| **Sr. No.** | **Description** | **UOM** | **Quantity** | **Unit Rate (Ex-works price including packing and forwarding but excluding Inland transportation up to FOT site)** | **Unit Inland transportation Charges up to FOT delivered at Site (BGL - Hyderabad / Vijayawada/ Kakinada) location and other costs incidental to delivery of goods including transit insurance but except GST** | **GST on finished Good (5)** | | **GST on inland transportation (6)** | | **Unit FOT - delivered at site, price per unit including packing and forwarding, GST, Inland transportation charges, transit insurance etc** | **Total FOT - delivered at site, including packing, and forwarding, GST, Inland transportation charges, transit insurance etc)** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7(a) | 7(b) | 8(a) | 8(b) | 9= 5+6+7(b)+8(b) | 10=9*4 |
| **PART A: BGL HYDERABAD GA** | | | | | | % | Amt | % | Amt. | | |

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | Design, Engineering, Manufacturing, Testing, Inspection, Supply, Transportation, Transit Insurance, Loading & Unloading , at BGL Authoroized site/store, Documentation including Erection, Installation, Commissioning with commissioning spares & Field Performance Test at BGL site of 400SCMH Electric Motor Driven Hydraulic Variable Suction CNG Booster Compressor ( PLC based), IOT compatible) with air compressor of capacity approx. 1.5KW discharge pressure approx. 10Kg/Cm2g, 100 water liter capacity air receiver and air dryer along with all accessories and auxiliaries as per technical volume of tender document complete in all respects including special tools & tackles with the list . | Nos | 5 | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A2 | Lump sum Repair & Comprehensive Maintenance charges (excluding the scope covers under warrantee) per Compressor Package including air compressor for 1st year during warrantee period in all Geographical Areas of BGL inclusive of all manpower, spare parts, lubricants and consumables, etc. including the Preventive Maintenance at regular interval by as per recommendation of OEM, Breakdown Maintenance as and when required for (5 packages X 12 Months) The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.40% (maximum 1.5%) of unit price (sl.no 1) quoted by the bidder. | Machine Months | 60 | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A3 | For 2nd Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.50% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder . | Machine Months | 60 | | | | | | | | |
| A4 | For 3rd year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.55% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 | | | | | | | | |
| A5 | For 4th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.61% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 | | | | | | | | |
| A6 | For 5th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.67% (maximum 1.5%) of unit price (sl.no A1) quoted by the bidder. | Machine Months | 60 | | | | | | | | |
| | | | **Total of Part A** | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **PART B: VIJAYAWADA /Kakinada GA** | | | | | | | | | | | |
| B1 | Design, Engineering, Manufacturing, Testing, Inspection, Supply, Transportation, Transit Insurance, Loading & Unloading at BGL Authoroized site/store, Documentation including Erection, Installation, Commissioning with commissioning spares & Field Performance Test at BGL site of 400SCMH Electric Motor Driven Hydraulic Variable Suction CNG Booster Compressor ( PLC based) with air compressor of capacity approx. 1.5KW discharge pressure approx. 10Kg/Cm2g, 100 water liter capacity air receiver and air dryer along with all accessories and auxiliaries as per technical volume of tender document complete in all respects including special tools & tackles with the list . | Nos | 1 | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B2 | Lump sum Repair & Comprehensive Maintenance charges (excluding the scope covers under warrantee) per Compressor Package including air compressor for 1st year during warrantee period in all Geographical Areas of BGL inclusive of all manpower, spare parts, lubricants and consumables, etc. including the Preventive Maintenance at regular interval by as per recommendation of OEM, Breakdown Maintenance as and when required for (1 package X 12 Months) The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.40% (maximum 1.5%) of unit price (sl.no 1) quoted by the bidder. | Machine Months | 12 | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B3 | For 2nd Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.50% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder . | Machine Months | 12 | | | | | | | | |
| B4 | For 3rd year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.55% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder. | Machine Months | 12 | | | | | | | | |
| B5 | For 4th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.61% (maximum 1.5%) of unit price (sl.no B1) quoted by the bidder. | Machine Months | 12 | | | | | | | | |
| B6 | For 5th Year<br>The quoted rate (for 1 Machine Month) for this item must be equal to or more than 0.67% (maximum 1.5%) of unit price (sl.no B 1) quoted by the bidder. | Machine Months | 12 | | | | | | | | |
| **Total of Part B** | | | | | | | | | | | |

| | | |
|---|---|---|
| **Grand Total (A+B) (Inclusive of all taxes)** | | |
| **Total Amount in Words (A+B) (Inclusive of all taxes)** | | |

Note: 1. BGL Intends to operate the booster compressors with out operator ensuring package remains in good condition. Therefore, the bidder is required to supply booster

2.. Bidder has to supply the PLC based machine with Internet of Things (IoT) capabilities to access the data through cloud. Bidder has to consider all necessary requirements to run on IoT system.

3.. The Location wise quantities may vary considering project requirement.

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