



# **MAHARASHTRA NATURAL GAS LIMITED (MNGL)**

**CITY GAS DISTRIBUTION PROJECT FOR MNGL, PUNE**

## **BID DOCUMENT FOR**


**Automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad Geographical Area (GA) of MNGL.**

**UNDER OPEN DOMESTIC COMPETITIVE BIDDING**

**(THROUGH E-TENDERING MODE)**

**Bid Doc. No.: MNGL/CP/2025-26/35 dated 25.06.2025**

**VOLUME I OF II**

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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## SECTION – I

### INVITATION FOR BIDS (IFB)

M/s. Maharashtra Natural Gas Ltd., Pune invites online bids (Technical & Financial) **UNDER TWO BID SYSTEM** from eligible bidders for the item(s) in complete accordance with the Bid Documents.

#### 1.0 TENDER INFORMATION

Tender Document Number	<b>MNGL/CP/2025-26/35 dated 25.06.2025</b>
ITEM(S)	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>
TYPE OF BID	Open Domestic Competitive Bidding
TIME SCHEDULE	As per Section V of Vol. II of II
EARNEST MONEY/ BID SECURITY	<b>Rs.2,00,000/- (Rupees Two Lakh Only) in the form of Demand Draft/BG/Online through e-portal to be in favour of “Maharashtra Natural Gas Ltd.” payable at Pune.</b>
BID SECURITY VALIDITY	6 (Six) months from the final bid due date
TENDER FEE ((Non-refundable)	Not applicable
BID VALIDITY	4 (Four) months from the final bid due date
Pre-bid meeting date and time	<b>02.07.2025 @ 11:00 Hrs.</b> VC Link: <a href="https://meet.google.com/hac-uezp-kpm">https://meet.google.com/hac-uezp-kpm</a>
Bid submission due date and time	<b>16.07.2025 till 15:00 Hrs. IST</b>
Techno-commercial bid opening date and time	<b>17.07.2025 at 16:00 Hrs. IST</b>
Bid Submission at	<a href="https://etenders.gov.in">https://etenders.gov.in</a>
Price bid opening date and time	Date and time shall be notified later
Address for submission of EMD/Bid Security and venue for pre-bid meeting and opening of bids	General Manager, C&P Department, M/s. Maharashtra Natural Gas Ltd., Pride Purple Coronet, 2 <sup>nd</sup> Floor, Baner Road, Baner, Pune – 411045
Contact details	Telephone: +91 (20) 25611000/1190/1153 Email: <a href="mailto:gasaid@mngl.in">gasaid@mngl.in</a> / <a href="mailto:neeraj@mngl.in">neeraj@mngl.in</a>
BIDDER ELIGIBILITY CRITERIA & BID EVALUATION CRITERIA	As per Annexure – I to IFB

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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NOTE: Bidders are advised to complete the registration with e-tender portal (<https://etenders.gov.in>) at least two working days prior to bid submission date.

Please note that in accordance with the general conditions of tender, MNGL may amend these dates of the tender process at its sole discretion. In case any of the specified dates are declared a public holiday, the deadline shall be the next working date.

## 2.0 BIDDING PROCEDURE

Bidding will be conducted through Open Domestic Tendering. Single Stage Two Bid system is adopted for this tender. The submission and opening of bids will be through e-tendering mode at <https://etenders.gov.in/eprocure/app>. Tender document can be downloaded from the website <https://etenders.gov.in/eprocure/app> or from e-tender link given on official MNGL website [www.mngl.in](http://www.mngl.in).

Note: To participate in the e-tendering, it is mandatory for the bidders to have user ID & password. For this purpose, the bidder must register itself on CPPP's website <https://etenders.gov.in/eprocure/app>. Please also note that the bidder must obtain digital signature token for applying in the tender and in general, activation of registration may take 24 hours' subject to the submission of all requisite documents required in the process.


Note: MNGL in no way shall be responsible if the bidder fails to apply due to non-possession of Digital Signature & non-registration.

**(The bids must be submitted online in electronic form at <https://etenders.gov.in/eprocure/app> only. No physical bids will be accepted.)**

## 3.0 DOWNLOADING OF TENDER DOCUMENT

The tender document is available for downloading from CPPP's e-tendering website <https://etenders.gov.in/eprocure/app> or from e-tender link given on official MNGL website [www.mngl.in](http://www.mngl.in) for viewing / participation of the eligible bidders. Bidders meeting the bid evaluation criteria who intend to submit their bid may download the tender for submission by the bid due date and time. Bidder shall give an undertaking on his letterhead that the contents of the bidding document have not been altered or modified. Bid evaluation criteria shall be applicable for all the bidders.

Disclaimer clause: Bidders are advised to visit CPPP's e-tendering website and MNGL website regularly for any updates on the tender. The ignorance to visit the website will not be accepted as a reason for any gap / missing information like corrigenda, amendments, clarifications etc.

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#### 4.0 PRE-BID MEETING

The bidder(s) or their designated representatives, who have downloaded the bid document, or to whom tender document has been issued and intend to bid are invited to attend the pre-bid meeting. Bidder(s) queries if any, must reach Purchaser office at least one day prior to pre-bid meeting date. The pre-bid meeting can be organized through video conferencing or physically. In case of physical meeting, the venue of pre bid meeting is MNGL office at Pride Purple Coronet, 2<sup>nd</sup> Floor, Baner Road, Baner, Pune – 411045.

Non-attendance of the pre-bid meeting will not be a cause for disqualification of a bidder. Corrigendum/addendum, if any, to the tender document, shall be hosted on the website after the pre-bid meeting.

Bidders may also note that the registration process for new bidders on e-tender portal shall take a minimum of 24 hrs. Hence, bidders are advised to kindly complete their registration on e-tender portal well in advance of the pre-bid meeting.

In case of pre-bid meeting through video conferencing, Link shall be sent to all the interested bidders by the purchaser.

Instructions to bidders for Pre-bid meeting through video conferencing: All bidders intending to attend pre-bid meeting must send their interest through email (at least 2 hours prior to the scheduled time of pre-bid meeting) to the purchaser. E-mail received from bidders within specified timeline shall be invited through email to attend the meeting.

Advisories for the bidders attending the pre-bid meeting:

(1) All the Bidders who have submitted their registration details and interest to attend the pre-bid meeting will be invited to join as guests through the link shared in mail.


(2) All bidders/participants mandatorily must pin MNGL screen on their computer screens during the pre-bid meeting.

(3) Bidders shall be allowed to discuss their queries in sequence of their responses received.


(4) Time slot shall be allotted to each bidder to ask his queries.

(5) Recording of the pre-bid meeting by the bidders is strictly prohibited. After pre-bid meeting, corrigendum shall be issued by the purchaser regarding clarifications or queries raised during meeting.

#### 5.0 OTHERS:

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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- 5.1 Bid Document is non-transferable.
- 5.2 Bids complete in all respects should reach on or before the BID DUE DATE AND TIME. Bids through Fax/ E-mail shall not be considered.
- 5.3 The Bid Document calls for offers on single point "Sole Bidder" responsibility basis.
- Order will be placed on the "Sole Bidder" alone (in whose name the bid document has been issued) who will be responsible for all contractual purposes.
- Further the bidders are advised to ensure that their offer is on single bidder responsibility basis and in total compliance of scope of supply as specified in Bid Document.
- 5.4 The bid should be prepared by the "Sole Bidder" and should be sent to MNGL directly. MNGL reserve the right to reject offers made by intermediaries' representatives.
- 5.5 Bidder shall ensure that Bid Security having a validity of 6(SIX) months from the bid due date, must accompany the offer in the format made available in the Bid Document.
- 5.6 This Invitation for Bids (IFB) is an integral and inseparable part of the enclosed Bid Document.
- 5.7 MNGL reserves the right to accept or reject any or all offers without assigning any reason whatsoever.
- 5.8 ZERO DEVIATION TENDER
- Bidder shall note that if any deviations are taken to the under-mentioned provisions of Bid Documents by the Bidder, the bid is liable to be rejected:
- i) Do not meet BEC Criteria
  - ii) Bid Security
  - iii) Performance Security (Contract Performance Bank Guarantee), **10% of Contract/Purchase Order Value**
  - iv) Delivery Period
  - v) Terms of Payment
  - vi) Force Majeure
  - vii) Resolution of Dispute/Arbitration
  - viii) Termination of Contract,
  - ix) Warranty and Guarantee
  - x) Offer not submitted for complete scope of work
  - xi) Firm prices
  - xii) Prices not quoted as per Schedule of Rates format.

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- xiii) Bidder has been put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s).
- xiv) Bidder is under liquidation.
- xv) Bids not conforming to technical specifications/requirements.
- xvi) Any other such provisions if specifically stipulated elsewhere in the Bid Document.
- xvii) Price Reduction Schedule.

**However, MNGL reserves the right to request the bidder to withdraw the deviations against above-mentioned provisions of Bid Documents.**


THIS IS NOT AN ORDER

Yours faithfully,  
For, M/s. Maharashtra Natural Gas Ltd., Pune

Ganesh Said  
General Manager (C&P)

Encl. 1. Vol. I of II & II of II of Bid Document.

**NOTE: Please confirm your intention to quote or not within 5 (Five) days. In case not intending to quote then please give your valuable feedback to us.**

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## ANNEXURE-I to IFB

### **BIDDER'S ELIGIBILITY CRITERIA (BEC)**

#### **1.0 GENERAL INFORMATION:**

Maharashtra Natural Gas Limited (MNGL) is a joint venture company of M/s GAIL (India) Limited and M/s Bharat Petroleum Corporation Limited (BPCL). MNGL has been set up to supply natural gas to domestic, commercial and industrial sectors including setting up of CNG filling stations to cater to the automobile sector for vehicle in Pune, Nashik, Ramanagara, Sindhudurga, Nanded & Nizamabad Geographical Areas

#### **2.0 SCOPE AND QUANTITY OF SUPPLY:**


Automation of CNG Stations as per the detailed scope specified in tender. Current Operational stations status along with the upcoming CNG stations within respective GA's for the Automation project as under:

Sr. No	GA	Stations for Automation FY 25-26 (Nos)
1	Pune	64
2	Nashik	70
3	Sindhudurg	20
4	Ramanagara	11
5	Nanded	22
6	Nizamabad	12
7	Additional Provision	31
		<b>300</b>

#### **3.0 BIDDER'S ELIGIBILITY CRITERIA (BEC):**

##### **A. TECHNICAL:**

- A.1 The Bidder must have successfully executed a turnkey project encompassing project management, design, engineering, integration, testing, supply, installation, and commissioning. The project should include local communication with third-party devices at the RTU level and communication between a minimum of 50 RTUs. The total project value should not be less than **INR 21 crores** and must have been carried out in a single **or** maximum two orders for a reputed organization.

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- A.2 The Bidder must be an experienced developer of the web application software proposed for this automation project.
- A.3 The offered RTU from the same product family (not necessarily the same version / release) must have been successfully used in at least one Automation project(s) in conjunction with the proposed web application developed by the bidder.
- A.4 In addition to the above, the bidder must have the following certifications and must provide the same for qualifying the criteria: ISO/IEC 27001 or ISO/IEC 20000-1 or ISO 9001 or ISO 22301 or CSA STAR or ISO/IEC TR 20000-9 or ISO 27017 or ISO 27018 and mandatory certifications include PCI DSS Compliance, Ministry of Electronics and Information Technology certification from Govt. of India, ANSI/TIA-942:2017 Rated 3 certifications. MNGL officials will conduct a facility inspection post-award of the project to verify the infrastructure and certifications. During the bidding process, the bidder must submit verifiable proof of all relevant certifications.

The bidder must submit supporting documents such as Purchase Order (P.O.) copies, Completion Certificates or Performance Certificates from clients, system architecture diagrams, and other relevant documentation. Failure to provide these documents may lead to disqualification, and MNGL reserves the right to reject the bid.

## **B. FINANCIAL:**

### **B.1 Turnover:**

The bidder should have achieved a minimum annual turnover of **Rs. 10.50 Crores** in any one of the last 3 (Three) audited financial years i.e. 2022-23, 2023-24 and 2024-25.

### **B.2 Net Worth:**


Net worth must be positive as per last audited financial statement i.e. for the financial year **2024-25**

### **B.3 Working Capital:**

The bidder should have a minimum working capital of **Rs.2.1 Crores** as per latest audited balance sheet i.e. for the year 2024-25.

If the bidder's working capital is inadequate, the bidder should supplement this with a letter from bidder's bank, having net worth not less than Rs.100 crores, confirming the availability of line of credit to cover the inadequacy of previous year and meet the current working capital requirement.



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Bidders must submit documentary evidence such as balance sheet & Profit & Loss A/c Statement for last three audited financial years i.e., **2022-23, 2023-24 and 2024-25** in support of the above.


If the audited financial results of the immediate preceding financial year i.e. 2024-25 is not available, then the audited financial results of the year immediately prior to **2024-25 i.e. 2023-24** shall be considered for calculation of Net Worth and Working Capital and audited Financial Results of the year **2021-22, 2022-23 and 2023-24** shall be considered for calculation of Annual Turnover as specified at B of Financial Criteria

Note: In absence of requisite documents, MNGL reserve the right to reject the bid without making any reference to the bidder.”

#### **4.0 EVALUATION AND AWARD OF WORK:**

Evaluation shall be done on overall least cost basis to the Purchaser (i.e., on total evaluated price including all taxes & duties).

**Note: In case of tie for L1 bidder, the order shall be placed on the bidder having highest turnover during the preceding 3 Financial Years i.e., 2022-23, 2023-24 and 2024-25 in support of the above.**

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## SECTION – II


### INSTRUCTIONS TO BIDDERS

#### INSTRUCTIONS FOR ONLINE BID SUBMISSION

The bidders are required to submit soft copies of their bids electronically on the Central Public Procurement (CPP) Portal i.e. <http://etenders.gov.in/eprocure/app>, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

#### **REGISTRATION:**

- (i) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:<https://etenders.gov.in/eprocure/app>) by clicking on the link "Online Bidder Enrolment" option available on the home page. Enrolment on the CPP Portal is free of charge.
- (ii) During enrolment/ registration, the bidders should provide the correct / true information including valid email-id & mobile no. All the correspondence shall be made directly with the contractors / bidders through email-id provided.
- (iii) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- (iv) For e-tendering, possession of valid Digital Signature Certificate (Class III Certificates with signing key usage) is mandatory which can be obtained from SIFY /nCode/eMudra or any Certifying Authority recognized by CCA India on eToken/ SmartCard.
- (v) Upon enrolment on CPP Portal for e-tendering, the bidders shall register their valid Digital Signature Certificate with their profile.
- (vi) Only one valid DSC should be registered by a bidder. Bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse and should ensure safety of the same.
- (vii) Bidders can then log into the site through the secured login by entering their user ID/ password and the password of the DSC/ eToken.

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#### **SEARCHING FOR TENDER DOCUMENTS:**


- 1) There are various search options built in the CPP Portal to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine several search parameters such as organization name, form of contract, location, date, other keywords, etc., to search for a tender published on the CPP Portal.
- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender in case they want to obtain any clarification / help from the Helpdesk.

#### **PREPARATION OF BIDS:**

- (i) For preparation of bid, Bidders shall search the tender from published tender list available on site and download the complete tender document and should consider corrigendum if any published before submitting their bids.

After selecting the tender document same shall be moved to the 'My favorite' folder of bidders account from where bidder can view all the details of the tender document.


- (ii) Bidder shall go through the tender document carefully to understand the documents required to be submitted as part of the bid. Bidders shall note the number of covers in which the bid documents have to be submitted, the number of documents – including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- (iii) Any pre-bid clarifications if required, then same may be obtained online through the tender site, or through the contact details given in the tender document.
- (iv) Bidders should get ready in advance the bid documents in the required format (PDF/xls/rar/dwf/jpg formats) to be submitted as indicated in the tender document/schedule. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.

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- (v) Bidders can update well in advance, the documents such as experience certificates, annual report, PAN, EPF & other details etc., under “My Space/ Other Important Document” option, which can be submitted as per tender requirements. This will facilitate the bid submission process faster by reducing upload time of bids.

**SUBMISSION OF BIDS:**

- (i) Bidder should log into the site well in advance for bid submission so that he/ she upload the bid in time i.e., on or before the bid submission time. Bidder will be responsible for any delay.
- (ii) Bidder should prepare the EMD as per the instructions specified in the NIT/ tender document. The details of the DD/BG/others physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise, the uploaded bid will be rejected.
- (iii) While submitting the bids online, the bidder shall read the terms & conditions (of CPP portal) and accepts the same to proceed further to submit their bid.
- (iv) Bidders shall select the payment option as offline to pay the EMD and enter details of the DD/BG/others.
- (v) Bidder shall digitally sign and upload the required bid documents one by one as indicated in the tender document.
- (vi) Bidders shall note that the very act of using DSC for downloading the tender document and uploading their offers is deemed to be a confirmation that they have read all sections and pages of the tender document without any exception and have understood the complete tender document and are clear about the requirements of the tender document.
- (vii) Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document. For the file size of less than 1 MB, the transaction uploading time will be very fast.
- (viii) If price quotes are required in XLS format, utmost care shall be taken for uploading Schedule of quantities & Prices and any change/ modification of the price schedule shall render it unfit for bidding. Bidders shall download the Schedule of Quantities & Prices i.e., Schedule of Rates, in XLS format and save it without changing the name of the file. Bidder shall quote their rate in figures in the appropriate cells,

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thereafter, save and upload the file in financial bid cover (Price bid) only.

If the template of Schedule of Quantities & Prices file is found to be modified/corrupted in the eventuality by the bidder, the bid will be rejected and further dealt as per provision of clause no 17.0 of ITB including forfeiture of EMD.

**The bidders are cautioned that uploading of financial bid elsewhere i.e., other than in cover 2 will result in rejection of the tender.**


- (ix) Bidders shall submit their bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.
- (x) After the bid submission (i.e., after Clicking "Freeze Bid Submission" in the portal), the bidders shall take print out of system generated acknowledgement number and keep it as a record of evidence for online submission of bid, which will also act as an entry pass to participate in the bid opening.
- (xi) Bidders should follow the server time being displayed on bidder's dashboard at the top of the tender site, which shall be considered valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system.
- (xii) All the documents being submitted by the bidders would be encrypted using PKI (Public Key Infrastructure) encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology.

#### **ASSISTANCE TO BIDDERS:**


- (i) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contract person indicated in the tender.

Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24X7 CPP Portal Helpdesk. The 24 x 7 Help Desk Number 0120-4001002, 0120-6277787 and 0120-4001005. The helpdesk email id is [support-eproc@nic.in](mailto:support-eproc@nic.in)

#### **A. GENERAL**

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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1. Scope of Bid:
  - 1.1 The Purchaser as defined in the General Conditions of Contract, hereinafter "the Purchaser" wishes to receive bids through e-tendering mode for the supply of goods as described in Section-IV, Special Condition of Contract.
  - 1.2 The successful bidder will be expected to complete the Scope of supply within the period stated in IFB.
  - 1.3 Throughout these bidding documents, the terms "bid" and "tender" and their derivatives ("bidder/tenderer", "bid/tendered", "bidding/ tendering", etc.) are synonymous, and day means calendar day. Singular also means plural.
2. Eligible Bidder
  - 2.1 Bidders shall, as part of their bid, submit a written power of attorney, authorizing the signatory of the bid to bind the bidder.
  - 2.2 This Invitation for Bids is open to any bidder and to pre-qualified bidders in case of limited tender.
  - 2.3 Bidders should not be associated or have been associated in the past, directly or indirectly, with a firm or any of its affiliates that have been engaged by the Purchaser to provide consulting services for the preparation of the design, specifications and other documents to be used for the procurement of the goods to be purchased under this Invitation for Bids.
  - 2.4 NA
  - 2.5 The bidder shall not be under a declaration of ineligibility by Purchaser for corrupt or fraudulent practices as defined in ITB.
  - 2.6 While evaluating the bids, pursuant to Bid Evaluation Criteria as specified in the Global notice of LFB, bidders past performance shall also be assessed *for* ascertaining the responsiveness of the bid. In such a case the decision of Purchaser shall be final and binding on the bidder.
  - 2.7 The bidder is not put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s).
3. One Bid per Bidder
  - 3.1 Each bidder shall submit only one bid. A bidder who submits or participates in more than one bid will cause all the proposals in which the bidder has participated to be

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disqualified. If bid of companies which is managed & controlled by same group of individuals (common owners/ proprietor, common partner/ common directors), the participation in a particular tender by more than one such bidder will not be allowed, and bids will be disqualified.

3.2 Also, if this fact is known at a later stage during bid evaluation or even after finalization of contract, the award will be made null and void and appropriate action including forfeiting of security deposit in any form and putting the firms on holiday list will be taken.

3.3 Alternative bids are not acceptable.

4. Bidder Eligibility

4.1 Experience Criteria as per Invitation for Bid (IFB) (Section – I of this Bid Document)

4.2 Financial Criteria as per Invitation for Bid (IFB) (Section – I of this Bid Document) (**UDIN from CA is compulsory on financial document**)

5. Cost of Bidding

5.1 The bidder shall bear all costs associated with the preparation and submission of the bid, and PURCHASER (MNGL), will in no case, be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

## **B. BIDDING DOCUMENT**

6. Content of Bidding


6.1 The bidding documents are those stated below Documents and should be read in conjunction with any addenda issued in accordance with ITB Clause

- a) Volume I of II - IFB, ITB, GCC, ATC
- b) Volume II of II – Scope Of Work etc.

6.2 The Bidder is expected to examine all instructions, forms, terms and specifications in the bidding documents. The Invitation for Bids (IFB) together with all its attachments thereto, shall be considered to be read, understood and accepted by the bidders. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in the rejection of its bid.

7. Clarification of Bidding Documents

7.1 A prospective Bidder requiring any clarification of the bid documents may notify the Owner and / or the Consultant as the case may be, in writing or by cable (hereinafter, the term 'cable' is deemed to include electronic mail and facsimile) at

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the address indicated in the tender. The Owner / Consultant will respond in writing to any request for clarification of the bid documents which it receives after issue of the bid documents but prior to at least one (01) working day before the pre-bid meeting date. Owner will not entertain any queries received after 1800 HRS post one (1) day of pre-bid meeting. Written copies of the Owner's/ Consultant's response (including an explanation of the query but without identifying the source of inquiry) will be hosted on CPPP's e-procurement website <https://etenders.gov.in> and MNGL website along with the corrigendum before the bid due date. All such clarifications issued shall deem to form a part and parcel of the Bid documents.

#### 8. Amendment of Bidding Documents


- 8.1 At any time prior to the bid due date, the PURCHASER may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents, by issuing addenda.
- 8.2 Any addendum /corrigendum/ clarifications to bidders query thus issued shall be part of the bidding documents pursuant to ITB Clause- 7.0 and shall be hosted on the on website [www.mngl.in](http://www.mngl.in) and CPPP's e-tendering website before bid due date. All the prospective bidders who have attended the Pre-Bid meeting/ submitted bid document fee, shall be informed by email/ post about the addendum/ corrigendum/ clarifications to bidder's query for their reference. Bidders desirous to submit its bid must take into consideration of all the addendum(s)/ corrigendum (s)/ clarifications to bidder's query hosted on the above websites before submitting the bid.
- 8.3 The PURCHASER may, at its discretion, extend the bid due date to allow prospective bidders, a reasonable time to furnish their most competitive bid considering the amendments issue
- 8.4 Bidders are advised to visit [www.mngl.in](http://www.mngl.in) and CPPP's e-tendering website from time to time to get updated information / documents.

### C. PREPARATION OF BIDS

#### 9. Language of Bid

- 9.1 The bid prepared by the bidder as well as all correspondence/drawings and documents relating to the bid exchanged by bidder and the PURCHASER shall be written in English language, provided that any printed literature furnished by the bidder may be written in another language so long as accompanied by an ENGLISH translation, in which case, for the purpose of interpretation of the bid, the ENGLISH translation shall govern.
- 9.2 In the event of submission of any document/certificate by the Bidder in a language other than English, the English translation of the same duly authenticated by



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Chamber of Commerce of Bidder's country shall be submitted by the Bidder. Metric measurement system shall be applied.

**10 Documents Comprising the Bids:**

**10.1** The bid prepared by the bidder shall comprise the following components that are required to be provided on the e-tendering portal:


**10.1.1 Technical cover:**

Scanned documents (duly signed by the authorized signatory) to be uploaded by the bidder on the portal as per list below:


- i) Covering Letter as per format "Submission of Tender" / "Submission of Bid" enclosed with Part- A of Vol-I of II.
- ii) Bidder's general/ details information as per format F-1.
- iii) Power of Attorney in favor of person(s) signing the bid that such person (s) is/are authorized to sign the bid on behalf of the bidder and any consequence resulting due to such signing shall be binding on the bidder.
- iv) Specific experience, annual turnover and equipment deployment details as called for in qualifying requirements.
- v) A Bid Form as per format F-2.
- vi) Copies of documents as required in list of enclosure.
- vii) Documents establishing the eligibility and conformity to the Bid Documents of all Goods and services, which the bidder proposes to supply under the award. Such document may be, literature, drawing or data and shall also include (a) the detailed description of the Good's essential technical and performance characteristics; (b) a clause-by-clause commentary on Employer's technical specification and demonstrating supplies substantial responsiveness to the specifications.
- ix) Copy of Bid security in accordance with IFB & Clause 17 of ITB to be furnished either in the form of Cashier's / Banker's cheque / Bank Draft payable to MNGL at Pune/ Bank Guarantee as per format F-4.
- x) Letter of authority in favour of any one or two of bidder's executives having authority to attend the un-priced and price bid opening on specified dates and venue as per format F-5.
- xi) Confirmation of no deviation as per Format F-6.
- xii) Present commitments strictly as per form F-9.
- xiii) Bidder's declaration that they are not under liquidation, court receivership or similar proceedings.
- xiv) Any other information/details required as per bid document.

**10.1.2 Financial cover:**


**Price Bid SOR as per the prescribed format on the e-tender portal.**

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- 10.2 All the documents submitted shall be duly signed and stamped on each page by the bidder or an authorized signatory of the bidder.
- 10.3 Bidders are advised to submit quotations based strictly on the terms and conditions and specifications contained in the bid document and not stipulate any deviations. Should it, however, become unavoidable, deviations should be stipulated only in the prescribed Pro forma. Owner reserves the right to evaluate quotations containing deviations having financial implications after adding the cost for such deviations as determined by Owner.
- 10.4 Original schedule of rates duly filled in shall not contain any condition whatsoever. Any condition given in this part shall not be considered and shall render the offer liable for rejection.
- 10.5 All signatures in bids shall be dated, as well as all pages of bids shall be initialed at lower right-hand corner by the Bidder or by a person holding power of attorney authorizing him to sign on behalf of the bidder before the submission of bids.
- 10.6 The Bidder's bid is central to the evaluation and selection process. Therefore, it is important that the Bidder carefully prepares the bid and answers all questions completely. Missing information and vague answers may delay the evaluation of a bid and may impair the Bidder's chances of success.
- 10.7 Information received by Purchaser from the Bidder will be disclosed to Purchaser's employees and/or advisers or external consultants for the purpose of evaluating the bid response.
11. Bid Form & Price Schedule
- 11.1 The bidders shall complete the Bid Form and appropriate, Price schedule furnished in the Vol II of II of Bidding Document, indicating the required information for all the goods to be supplied, a brief description of the goods, their country of origin and quantity.
- 12.0 BID PRICES
- 12.1 The Bidder shall e-quote Bid Prices on appropriate format of "Schedule of Rates" (SOR) as enclosed part of bid documents as it proposes to supply under the contract.
- 12.2 Indian Bidders shall indicate the following separately (as per Price Schedule)
- A) Ex-works Price including packing and forwarding charges (such price to include all costs as well as duties and taxes paid or payable on components and raw materials incorporated or to be incorporated in the goods).

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- B) Goods & Service Tax which will be payable on the finished goods if this contract is awarded.
  - C) The bidders shall indicate breakup of the quantum of imports involved for import of necessary raw materials and components giving CIF value of Import in applicable currency considered and included in bid price Essentiality certificate may be provided by the Purchaser for Project imports, wherever applicable.
  - D) The statutory variation in Goods & Service Tax (GST) on finished goods covered under Cl. 12.1 B within the contractual delivery period shall be to MNGL's account. However, any increase in the rate of these taxes and duties beyond the contractual completion period shall be to bidder's account and any decrease in rate shall be passed on to MNGL. Further, any statutory variation in the rate of customs duty (except GST) within contractual delivery period, on-the actual CIF value of import content, but subject to maximum of such duty payable on quoted CIF value, under Cl. 12.1 (A) shall also be to MNGL's account. In case of delay in delivery, any increase in the rate of customs duty beyond the contractual completion period shall be to bidder's account and any decrease in rate shall be passed on to MNGL.
  - E) The total amount which can be claimed / set off by MNGL for CENVAT (for Goods & Service tax) separately.
- 12.3 Inland transportation, other local costs incidental to delivery of the goods to its destination (FOT-site) shall be quoted by the Bidder.
- 12.4 The bidder's break-up of price components in accordance with above sub-clauses will be solely for the purpose of facilitating the comparison of bids and will not in any way, limit the PURCHASER's right to contract on different terms.
- 12.5 Fixed Price: Prices quoted by the bidder shall be firm and fixed during the bidder's performance of the contract and not subject to variation on any account except for variations permitted under 12.1 D for domestic bidders. A bid submitted with an adjustable price quotation will be treated as non-responsive and rejected.
- 12.6 The delivery terms shall be interpreted as per INCOTERMS 2010.
- 13 Bid Currencies
- 13.1 Bidders shall submit their bids in Indian Rupees only.
- 14 Documents Establishing Bidder's Eligibility and Qualification
- 14.1 Bid Evaluation Criteria

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14.1.1 Pursuant to evaluation Criteria specified in Invitation for Bids (IFB) the bidder shall furnish all necessary supporting documentary evidence to establish the bidder's claim of meeting Bid evaluation criteria.

#### 14.2 Bidders Eligibility Criteria

14.2.1 The bidder shall furnish, as part of his bid, documents establishing the bidder's eligibility to bid and its qualification to perform the contract if its bid is accepted.

14.2.2 The documentary evidence of the bidder's qualifications to perform the contract if his bid is accepted, shall establish to the PURCHASER'S satisfaction:

- a) that, in the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture (or otherwise, produce, the Bidder has been duly authorized by the goods Manufacturer or producer to supply the goods in the Purchaser's country).
- b) that the Bidder has the financial, technical and production capacity necessary to perform the contract.
- c) that, in case of a Bidder not doing business within the Purchaser's country, the Bidder is or will be (if awarded the contract) represented by an Agent in that country equipped and able to carry out the Supplier's maintenance, repair and spare parts stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications.

14.2.3 The PURCHASER will determine to its satisfaction whether the bidder selected as having submitted the lowest evaluated, responsive bid is qualified to satisfactorily perform the contract. An affirmative determination will be pre-requisite for award of the Contract.


#### 15 Documents Establishing Goods' Eligibility and Conformity to Bidding Documents

15.1 Pursuant to ITB Clause 10, the bidder shall furnish, as part of the bid, documents establishing the eligibility and conformity to the Bidding Documents of all goods and services which the bidder proposes to supply under the Contract.

15.2 The documentary evidence of the goods and services' conformity to the Bidding Documents may be in the form of literature, drawings or data and shall furnish:

- a) detailed description of the essential technical and performance characteristics of the goods.
- b) a clause-by-clause commentary on the PURCHASER'S Technical specifications demonstrating the goods and services' substantial responsiveness to the specifications.

15.3 For purpose of the commentary to be furnished under Clause-15.2 above, the bidder shall note that standards for workmanship, material and equipment and reference to brand names or catalogue numbers, designated by the PURCHASER in its Technical Specifications are intended to be descriptive only and not restrictive.

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**16 Period of Validity of Bids**

16.1 The bid shall remain valid for acceptance for four (4) months from the bid due date.

16.2 In exceptional circumstances, prior to expiry of the original bid validity period, the PURCHASER may request that the bidder extend the period of bid validity for a specified additional period. The requests and the responses thereto shall be made in writing (by fax / post e-mail). A bidder may refuse the request without forfeiture of his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid but will be required to extend the validity of its bid security for the period of the extension and in accordance with ITB Clause 17.0 in all respects.

**17 Bid Security**

17.1 Pursuant to ITB Clause-10, the bidder shall furnish, as part of his bid, bid security in the amount specified in the Invitation for Bids.

17.2 The bid security is required to protect the PURCHASER against the risk of bidder's conduct which would warrant the security's forfeiture, pursuant to ITB Clause-17.7

17.3 The bid security in Indian Rupees for bidders quoting in Indian currency shall be in the form of a Bank Draft/ Banker's Cheque in favour of Maharashtra Natural Gas Ltd. payable at Pune or in the form of an irrevocable Bank Guarantee in favour of Maharashtra Natural Gas Ltd. as per Format F-4.


In case Bid Security is in the form of a irrevocable Bank Guarantee, the same shall be from any Indian scheduled bank or a branch of an International bank situated in India and registered with Reserve bank of India as scheduled foreign bank. However, in case of Bank Guarantee from Banks other than the Nationalized Indian bank, the bank must be a commercial Bank having Net Worth in excess of Rs.100 Crore and a declaration to this effect should be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead. Bid Security shall be valid for 2 months beyond the validity of the Bid.

17.4 Any bid not secured in accordance with ITB Clause 17.1 and 17.3 may be rejected by the PURCHASER as non-responsive.


17.5 Unsuccessful bidder's bid security will be discharged/returned as promptly as possible after award of contract and signing of agreement.

17.6 The successful bidder's bid security will be discharged upon the bidder's accepting the order, pursuant to ITB Clause-41 and furnishing the Contract Performance Guarantee pursuant to ITB Clause-42.

17.7 The bid security may be forfeited:

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- a) If a bidder withdraws his bid during the period of bid validity.
  - b) in the case of a successful bidder if the bidder fails:
    - i) to accept the Purchase Order in accordance with ITB Clause-41 or
    - ii) to furnish Performance Guarantee in accordance with ITB Clause-42
    - iii) to accept correction of errors pursuant to ITB Clause 32.0
  - c) If the Bidder changes the proposed manufacturer after submission of his bid.
- 17.8 Bid Security should be in favor of Maharashtra Natural Gas Ltd. and addressed to MNGL. Bid Security must indicate the Bid Document number and the item for which the bidder is quoting. This is essential to have proper co-relation later. The Bid Security in the form of Bank Guarantee or letter of Credit shall be in the form provided in the Bidding Document.
- 17.9 **The Indian / Domestic firms registered with NSIC / MSME, under its single point registration scheme are exempted from furnishing Bid Security, provided they are registered for the items / work they intend to quote and subject to their enclosing with their bid a copy of latest and current registration certificate.**
18. Pre-Bid meeting – As per IFB
- 18.1 The bidder(s) or his designated representative, who have purchased bid document, are invited to attend a pre-bid meeting which will take place as indicated in IFB.
- 18.2 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 18.3 Text of the questions raised, and the responses given, together with any responses prepared after the meeting, will be transmitted without delay (without identifying the sources of the question) to all purchasers of the bidding documents. Any modification of the bidding documents listed in ITB Sub-Clause 7.1 that may become necessary because of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 8 and not through the minutes of the pre-bid meeting.
- 18.4 Non-attendance of the pre-bid meeting will not be a cause for disqualification of a bidder.
- 19 Format and Signing of Bid
- 19.1 The bid shall be typed or written in indelible ink. Each page of bid offer shall be stamped and signed by the Bidder or a person or persons duly authorized by competent authority in order to bind the bidder to the contract.

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19.2 Any interlineations, erasures, or corrections shall be valid only if the person or persons signing the bid initial them. Overwriting will not be treated as correction and may lead to rejection of bid. A correction shall be considered if a part of text or figures or dates needing corrections are deleted and a separate text or figure or date, as the case may be, is written separately having proper link to the place of correction.

19.3 As bidding shall be done through e-tendering, digitally signed documents to be uploaded.

20 Zero Deviation

20.1 Bidders to note that, MNGL will appreciate submission of offer based on the terms and conditions in the enclosed General Conditions of Contract, Special Conditions of Contract (SCC), Instructions to Bidders (ITB), Scope of supply, technical specifications etc, to avoid wastage of time and money in seeking clarifications on technical/ commercial aspects of the offer.


20.2 If any deviations are taken to the under-mentioned provisions of Bid Documents by the Bidder the bid is liable to be rejected:

- i) Do not meet BEC Criteria
- ii) Bid Security
- iii) Performance Security (Contract Performance Bank Guarantee), 10% of Contract/Purchase Order Value
- iv) Delivery Period
- v) Terms of Payment
- vi) Force Majeure
- vii) Resolution of Dispute/Arbitration
- viii) Termination of Contract,
- ix) Warranty and Guarantee
- x) Offer not submitted for complete scope of work
- xi) Firm prices
- xii) Prices not quoted as per Schedule of Rates formats.
- xiii) Bidder have been put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s).
- xiv) Bidders is under liquidation.
- xv) Bids not conforming to technical specification/requirements.
- xvi) Any other such provisions if specifically stipulated elsewhere in the Bid Document.
- xvii) Price Reduction Schedule

**However, MNGL reserves the right to request the bidder to withdraw the deviations against above mentioned provisions of Bid Documents.**


21 Mode of Payment



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- 21.1 Maharashtra Natural Gas Ltd. will issue A/C payee cheque for payment payable at par in case work is awarded to bidder.
- 22 Agent/ consultant/ Representative/ Retainer/ Associate [Applicable for ICB tenders only].
- 22.1 MNGL would prefer to deal directly with the manufacturers/ principals abroad but in case they decide to have their Agent/Consultant/Representative/Retainer/ Associate in India and pay commission for their services against a particular tender, it should be bare minimum, and the principal would have to certify that such a commission is commensurate with the services rendered to them by such an Agent/ Consultant /Representative/ Retainer/ Associate in India. The principal will also have to broadly list out services to be rendered by the Agent/ Consultant/ Representative Retainer/ Associate in India.
- 22.2 In the event bidder has as Agent/ Consultant/ Representative/ Retainer/ Associate/ servicing facilities in India (who is not an employee of the bidder) the bidder should indicate in their offer the name of such an Agent/ Consultant/ Representative/Retainer / Associate, they have for services in India. The bidder must also clearly indicate the commission payable to the Agent/Consultant/ Representative Retainer/Associate in rupees in terms of Agreement (enclosing copy of the same). The bidder, in his bid will indicate the nature and extent of service to be provided by such an Agent/Consultant Representative/Retainer/ Associate on behalf of the bidder and remuneration therefore provided in the price, as a separate item, quoted by the bidder to MNGL. Such remuneration/commission will be paid by MNGL in non-convertible Indian currency in India. Should it be established at any subsequent point of time that the above statement of the bidder is not correct or that any other amount of remuneration commission either in India or abroad is being paid to anyone (who is not an employee of the bidder), the bidder would be liable to be debarred from participating in the future tenders of MNGL.
- The following particulars will also be furnished by the bidder:
- (i) The precise relationship between the foreign manufacturer/principal and their Agent/Consultant Representative / Retainer/ Associate in India.
  - (ii) The mutual interest which the manufacturer/principal and the Agent/ Consultant/ Representative Retainer/Associate in India have in the business of each other.
  - (iii) Any payment which the Agent/ Consultant/ Representative/ Retainer/ Associate receives in India or abroad from the manufacturer/principal whether as a commission for the contract or as a general fee.
  - (iv) All services to be rendered by the Agent Consultant Representative / Retainer/Associate.
- 22.3 Overseas bidder should send their bids directly and not through Agent/ Consultant/ Representative / Retainer /Associate Agent Consultant Representative Retainer/ Associate of the overseas manufacturers/suppliers are, however, permitted to



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purchase bidding documents and attend bid opening provided such as Agent/ Consultant / Representative/ Retainer/ Associate has a power of attorney/ letter of authority setting out very clearly his role, which will be limited to such areas of activity as purchase of bidding documents, attending of bid opening and claiming of payment for their services, provided further that such a power of attorney/letter of authority is submitted to MNGL in advance for scrutiny and acceptance or otherwise.

#### **D. SUBMISSION OF BIDS**

##### **23.0 PREPARATION OF BIDS**

- 23.1 Scanned documents (duly signed by the authorized signatory) and/or pre-formatted excel files to be uploaded by the bidder on the portal which shall comprise of the documents mentioned in Clause No. 10 of ITB.

Note: All pages of the bid offer to be signed and stamped by an authorized representative (as described in bid document) of the bidder.

Bidder must ensure numbering of all pages submitted in bid document. Further total number of pages submitted in bid document must be mentioned in the covering letter of bid submitted.


- 23.2 The price bid shall contain Schedule of Rates dully filled in the prescribed format available on the e-portal.

##### **24.0 DEADLINE FOR SUBMISSION OF BID**

- 24.1 The bid must be submitted on the specified e-tendering portal as specified in IFB not later than the time and date as specified in IFB. The online e-tendering portal will not allow any bid or part thereof whatsoever to be submitted after the due time on the due date.
- 24.2 The Purchaser may, in exceptional circumstances and at its discretion, on giving reasonable notice by email or any written communication to all prospective bidders who have been issued the bid document to extend the deadline for the submission of bids in which case all rights and obligations of the Purchaser and bidders, previously subject to the original deadline will thereafter be subject to deadline as extended.

##### **25.0 LATE BIDS**

Any Bid Security / EMD received by the Purchaser after the deadline for submission of bid may render the bid to be declared "Late" and such bid is liable for rejection; such EMD may be returned unopened to the bidder at the sole discretion of the Purchaser.

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## 26.0 MODIFICATION AND WITHDRAWAL OF BIDS

- 26.1 The bidder may modify or withdraw its bid after the bid submission, but, before the due date of submission as per provisions provided on the e-tendering portal. After the bid due date & time however, no modifications whatsoever are allowed in the bid.
- 26.2 No bid shall be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid form. In case of request in written by the authorized signatory for withdrawal of a bid during this interval, the Bidder's bid security shall be forfeited.
- 26.3 Upon selecting "withdraw" option on the e-tender portal and providing the reason for withdrawal, the portal will not allow the bidder to re-submit his bid. MNGL shall not be responsible if the bidder is not able to re-submit his bid after withdrawal.

## E. OPENING AND EVALUATION OF BIDS


### 27. Bid Opening

- 27.1 The Purchaser will open all bids on the e-tendering portal in the presence of bidder(s) representatives who choose to attend, at the time, on the date and place (as specified in IFB). The bidder(s) representatives, who are present, shall sign an attendance sheet evidencing their attendance, if so, required by the Purchaser.
- 27.2 The Bidder's names and the presence or absence of requisite Bid Security (EMD) and such other details as the Purchaser, at its discretion, may consider appropriate, will be announced at the opening. No bid shall be rejected at bid opening, except for bids without EMD.
- 27.3 Bids that are not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances. Bidder's specific attention is drawn to this stipulation to enable the representative of the Bidder at the bid opening time to bring out to the attention for the Purchaser any documents pertaining to its bid is not being acknowledged and relevant portions read out.
- 27.4 The Purchaser will prepare a bid opening statement to be signed by all representatives present during bid opening.


### 28 Process to be Confidential

- 28.1 Information relating to the examination, clarifications, evaluation and comparison of bids and recommendations for the order, shall not be disclosed to bidders or any other person officially concerned with such process.

### 29 Contacting the Purchaser

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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- 29.1 From the time of the bid opening to the time of the release of order, if any bidder wishes to contact the Purchaser for any matter relating to the bid, it should do so in writing.
- 29.2 Any effort by a bidder to influence the Purchaser in any manner in respect of bid evaluation or award will result in the rejection of that bid.
- 30 Preliminary Examination of Bids
- 30.1 Technical-Commercial Bid Evaluation
- 30.1.1 The PURCHASER will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required securities have been furnished, whether the documents have been properly signed and whether the bids are generally in order.
- 30.1.2 Prior to the detailed evaluation, the PURCHASER will determine whether each bid is of acceptable quality, is generally complete and is responsive to the Bidding Documents. For purposes of this determination a responsive bid is one which conforms to all the terms, conditions and specification of the bidding document, without deviations, objections, conditionally or reservations.
- 30.1.3 No deviation whatsoever, is permitted in the Bidding Documents and the Priced bids of those bidders whose Un-Priced bids contain any exception to the conditions and stipulations of the Bidding Documents shall not be opened and returned unopened to such bidder(s).
- 30.1.4 The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence. If a bid is non-responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the bidder by correction of the nonconformity.
- 30.1.5 The Purchaser will carry out a detailed evaluation of the bids previously determined to be responsive to determine whether the technical aspects are in accordance with the requirements set forth in the Bidding Documents. To reach such a determination, the Purchaser will examine and compare the technical aspects of the bids based on the information supplied by the bidders, taking into account the following factors:
- Overall completeness and compliance with the Technical Specifications; quality function and operation of the process control concept included in the bid. The bid that does not meet minimum acceptable standard of completeness, consistency and detail will be rejected as non-responsive.
  - Any other relevant factor, if any that the Purchaser deems necessary or prudent to be taken into consideration.

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30.2 Requisite forms contain all necessary information including those, required for meeting qualifying criteria stipulated in the Bidding Document.

### 31.0 **OPENING OF PRICE BID**

31.1 In case of two-part bidding, the Bidders whose bids are found substantially responsive shall be opened through e-tender portal. Such bidders may be required to attend the price bid opening at a short notice.

31.2 The bid prices stated in the price schedules will be announced during price bid opening.

### 32 Arithmetic Corrections

32.1 The bids will be checked for any arithmetical errors as follows:

32.1.1 In case of any discrepancy between prices in words and prices in figures, the prices in words shall be valid and binding. In case of any error in total indicated by the Bidder, the unit price alone shall be considered valid and binding on the Bidder.

32.1.2 If the bidder does not accept the correction of errors, his bid will be rejected, and the bid security will be forfeited.

### 33 Conversion to Single Currency *[Applicable in ICB tenders only]*

33.1 To facilitate evaluation and comparison, the PURCHASER will convert all bid prices expressed in the amounts in various currencies in which bid price is payable, to Indian Rupees at the Bills selling exchange rate declared by the State Bank of India on the working day prior to Priced bid (Part-II) opening.

### 34 Evaluation and Comparison of Bids


34.1 The PURCHASER will evaluate and compare the bids previously determined to be substantially responsive, pursuant to ITB Clause - 30.

34.2 Bid Evaluation and Comparison Criteria: The evaluation and comparison of bids will be done as per the provisions of the bid evaluation criteria as per Annexure – I to ITB

34.4 Bids not conforming to Bid Qualification criteria and technical & commercial requirements shall be rejected.


### 35 Domestic Preference

35.1 VOID

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**35.2 PROCUREMENTS FROM A BIDDER WHICH SHARES A LAND BORDER WITH INDIA:**


- I. Order (Public Procurement No. 1) dated 23.07.2020, Order (Public Procurement No. 2) dated 23.07.2020 and Order (Public Procurement No. 3) dated 24.07.2020, Department of Expenditure, Ministry of Finance, Govt. of India refers. The same are available at website <https://doe.gov.in/procurement-policy-divisions>.
- II. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. For details of competent authority refer to Annexure I of Order (Public Procurement No. 1) dated 23.07.2020. Further the above will not apply to bidders from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Updated lists of countries to which lines of credit have been extended or in which development projects are undertaken are given in the website of the Ministry of External Affairs, Govt. of India
- III. "Bidder" (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) for purpose of this provision means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.
- IV. "Bidder from a country which shares a land border with India" for the purpose of this:
  - a. An entity incorporated, established or registered in such a country; or
  - b. A subsidiary of an entity incorporated, established or registered in such a country; or
  - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
  - d. An entity whose beneficial owner is situated in such a country; or
  - e. An Indian (or other) agent of such an entity; or
  - f. A natural person who is a citizen of such a country; or
  - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- V. "Beneficial owner" for the purpose of above (IV) will be as under:

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

Explanation:

1. "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company.
2. "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholder's agreements or voting agreements.
- ii. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
- iii. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals.
- iv. Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official.
- v. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- VI. "Agent" for the purpose of this Order is a person employed to do any act for another, or to represent another in dealings with third persons
- VII. The Successful bidder shall not be allowed to subcontract works to any contractor from a country which shares a land border with

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India unless such contractor is registered with the Competent Authority.

- VIII. SUBMISSION OF CERTIFICATE IN BIDS: Bidder shall submit a certificate in this regard as Format F-18. If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for immediate rejection of the bid/termination and further action as per "Procedure for Action in case of Corrupt/Fraudulent/ Collusive / Coercive Practices" of tender document.
- IX. The registration, wherever applicable, should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

#### **F. AWARD OF CONTRACT**

##### **36 Post Qualification**

- 36.1 In the absence of prequalification, the PURCHASER will determine to its satisfaction whether the bidder selected as having submitted the lowest evaluated, responsive bid is qualified to satisfactorily perform the contract.
- 36.2 The determination will take into account the bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the bidder's qualifications submitted by the Bidder, pursuant to ITB Clause-10, as well as such other information as the PURCHASER deems necessary and appropriate.
- 36.3 An affirmative determination will be a prerequisite for award of the contract to the bidder. A negative determination will result in rejection of the bidder's bid.


##### **37 Award Criteria**

- 37.1 Subject to ITB Clause 30, the Purchaser will award the contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined to be the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the contract satisfactorily.

##### **38 PURCHASER's Right to Vary Quantities at Time of Award**

- 38.1 PURCHASER reserves the right at the time of award of ORDER to increase or decrease by upto 20% the quantity of GOODS specified in the Material Requisition, without any change in unit price or other terms and conditions. Variation beyond




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this limit will be subject to mutual agreement between the PURCHASER and the Seller.

- 39 PURCHASER's Right to Accept Any Bid and to Reject Any or All Bids
  - 39.1 PURCHASER reserves the right to accept or reject any bid and to annul the bidding process and reject all bids, at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligations to inform the affected bidder or bidders of the ground for the PURCHASER'S ACTION.
- 40 Notification of Award/ Fax of Intent / Purchase Order
  - 40.1 Prior to the expiration of period of bid validity, the PURCHASER will notify the successful bidder in writing, by fax or email to be confirmed in writing that his bid has been accepted. The notification of award/ Fax of Intent / Purchase Order will constitute the formation of the Contract.
  - 40.2 Delivery shall be counted from the date of Purchase Order/Service Order.
  - 40.3 Upon the successful bidder's furnishing of contract performance bank guarantee. Pursuant to ITB Clause-42, the PURCHASER will promptly notify each unsuccessful bidder and will discharge his bid security pursuant of ITB Clause 17.
- 41 Acceptance of Purchase Order
  - 41.1 PURCHASER will issue the Purchase Order to the successful bidder, who, within 07 days of receipt of the same, shall sign all pages and return the acceptance copy to the PURCHASER.
- 42 Performance Guarantee
  - 42.1 Unless mentioned in notification of award /Fax of Intent / Purchase Order within 15 days of the receipt of the Delivery Order from the PURCHASER, the successful bidder shall furnish the performance guarantee in accordance with Clause 12 of General Conditions of Contract in the form provided in the bidding documents. The Bank Guarantee/Letter of Credit towards performance guarantee shall be in the currency of the Contract.
  - 42.2 The performance guarantee shall be for an amount equal to 10% of Purchase Order Value towards faithful performance of the contractual obligations and performance of equipment. This Bank Guarantee/Letter of Credit shall be from any Indian scheduled bank or a branch of an international bank situated in India and registered with Reserve bank of India as scheduled foreign bank. This bank guarantee/letter of Credit shall be valid for a period as-stated in Clause-12 of General Conditions of Contract



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- 42.3 Failure of the successful bidder to comply with the requirements of this clause shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security.
- 43 Income Tax Liability
- 43.1 The bidder will have to bear all income tax liability, both Corporate as well as for his personnel.
- 44 Corrupt or Fraudulent Practices:
- 44.1 MNGL requires that bidders / contractors observe the highest standard of ethics during the execution of contracts. In pursuance of this policy, the Employer:
- a) defines, for the purposes of this provision, the terms set forth below as follows:
    - i) "corrupt practice" means the offering, giving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
    - ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.
  - b) will reject a proposal for award if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.
  - c) will declare a firm ineligible and put on holiday, either indefinitely or for a stated period of time if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing a contract.

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**UNDERTAKING ON LETTERHEAD**

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Sub.:

Tender No.:

Dear Sir / Ma'am,

We have read the clause regarding Provisions for Procurement from a Bidder which shares a land border with India, we certify that, bidder M/s \_\_\_\_\_ (Name of Bidder) is:


(i) Not from such a country [                      ]

(ii) If from such a country, has been registered [                      ]  
With the Competent Authority.  
(Evidence of valid registration by the  
Competent Authority shall be attached)

***(Bidder to tick appropriate option above)***

We hereby certify that bidder M/s \_\_\_\_\_ (***Name of bidder***) fulfils all requirements in this regard and is eligible to be considered against the tender.

Place:	{Signature of Authorised Signatory of Bidder}
Date:	Name:
	Designation:
Seal:	


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### SECTION – III GENERAL CONDITIONS OF CONTRACT (GCC - GOODS)

#### **1 Definitions**


In this document, General Conditions of Contract (GCC), the following terms shall have the following respective meanings:

- 1.1 The "APPOINTING AUTHORITY" for the purpose of arbitration shall be the MANAGING DIRECTOR or any other person so designated by the EMPLOYER.
- 1.2 "APPROVED" shall mean approved in writing including subsequent written confirmation of previous verbal approval and "APPROVAL" means approval in writing including as aforesaid
- 1.3 BIDDER: Designates the individual or legal entity which has made a proposal, a tender or a bid with the aim of concluding a Contract with the PURCHASER.
- 1.4 CONTRACT shall mean Purchase Order/Contract and all attached exhibits and documents referred to therein and all terms and conditions thereof together with any subsequent modifications thereto.
- 1.5 CONTRACT PRICE shall mean the price payable to the Seller under the Contract for the full and proper performance of his contractual obligations.
- 1.6 COMPLETION DATE shall mean the date on which the goods are successfully commissioned by the Seller and handed over to the PURCHASER.
- 1.7 COMMERCIAL OPERATION shall mean the condition of the operation in which the complete equipment covered under the Contract is officially declared by the PURCHASER to be available for continuous operation at different loads upto and including rated capacity.
- 1.8 The "CONTRACTOR" means the person or the persons, firm or Company or corporation whose tender has been accepted by the EMPLOYER and includes the CONTRACTOR's legal Representatives his successors and permitted assigns.
- 1.9 "CONSTRUCTION EQUIPMENT" means all appliances/equipment and things whatsoever nature for the use in or for the execution, completion, operation, or maintenance of the work or temporary works (as hereinafter defined) but does not include materials or other things intended to form or to be incorporated into the WORK or camping facilities.
- 1.10 "CONTRACT DOCUMENTS" means collectively the Tender Documents, Designs, Drawings, Specification, Schedule of Quantities and Rates, Letter of Acceptance

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and agreed variations if any, and such other documents constituting the tender and acceptance thereof.

- 1.11 The "CHANGE ORDER" means an order given in writing by the ENGINEER-IN-CHARGE to effect additions to or deletion from and alteration in the works.
- 1.12 The "COMPLETION CERTIFICATE" shall mean the certificate to be issued by the ENGINEER-IN-CHARGE when the works have been completed entirely in accordance with CONTRACT DOCUMENT to his satisfaction.
- 1.13 COMMISSIONING" shall mean pressing into service of the system including the plant(s), equipment(s), vessel(s), pipeline, machinery(ies), or any other section or sub-section of installation(s) pertaining to the work of the CONTRACTOR after successful testing and trial runs of the same.
- 1.14 "COMMISSIONING" can be either for a completed system or a part of system of a combination of systems or sub-systems and can be performed in any sequence as desired by EMPLOYER and in a manner established to be made suited according to availability of pre-requisites. Any such readjustments made by EMPLOYER in performance of "COMMISSIONING" activity will not be construed to be violating CONTRACT provisions and CONTRACTOR shall be deemed to have provided for the same.
- 1.15 "DAY" means a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day
- 1.16 DELIVERY terms shall be interpreted as per INCOTERMS 2010 in case of Contract with a foreign Bidder and as the date of FOT Site in the case of a contract with an Indian Bidder.
- 1.17 DRAWINGS shall mean and include Engineering drawings, sketches showing plans, sections and elevations in relation to the Contract together with modifications and/or revisions there.
- 1.18 ENGINEER or Engineer-in-Charge of the Project SITE shall mean the person designated from time to time by PURCHASER at SITE and shall include those who are expressly authorized by him to act for and on his behalf for operation of this CONTRACT.
- 1.19 FINAL ACCEPTANCE shall mean the PURCHASER's written acceptance of the Works performed under the Contract after successful completion of performance and guarantee test.
- 1.20 The "FINAL CERTIFICATE" in relation to a work means the certificate regarding the satisfactory compliance of various provision of the CONTRACT by the

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CONTRACTOR issued by the ENGINEER-IN- CHARGE/EMPLOYER after the period of liability is over.


- 1.21 GOODS shall mean articles, materials, equipment, design and drawings, data and other property to be supplied by Seller to complete the contract.
- 1.22 INSPECTOR shall mean any person or outside Agency nominated by PURCHASER/CONSULTANT through CONSULTANT to inspect equipment, stagewise as well as final, before dispatch, at SELLER's works and on receipt at SITE as per terms of the CONTRACT.
- 1.23 INITIAL OPERATION shall mean the first integral operation of the complete equipment covered under the Contract with subsystems and supporting equipment in service or available for service.
- 1.24 "MOBILIZATION" shall mean establishment of sufficiently adequate infrastructure by the CONTRACTOR at "SITE" comprising of construction equipments, aids, tools tackles including setting of site offices with facilities such as power, water, communication etc. establishing manpower organization comprising of Resident Engineers, Supervising personnel and an adequate strength of skilled, semi-skilled and un-skilled workers, who with the so established infrastructure shall be in a position to commence execution of work at site(s), in accordance with the agreed Time Schedule of Completion of Work. "MOBILISATION" shall be considered to have been achieved, if the CONTRACTOR is able to establish infrastructure as per Time Schedule, where so warranted in accordance with agreed schedule of work implementation to the satisfaction of ENGINEER-IN-CHARGE/ EMPLOYER
- 1.25 "NOTICE IN WRITING OR WRITTEN NOTICE" shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received by the addressee) by registered post to the latest known private or business address or registered office of the addressee and shall be deemed to have been received in the ordinary course of post it would have been delivered.
- 1.26 PURCHASER/EMPLOYER/OWNER/COMPANY/MNGL shall mean MAHARSHRATRA NATURAL GAS LIMITED (MNGL) having its registered office at Pune (Maharashtra) PURCHASER includes successors, assigns of MNGL.
- 1.27 "PLANS" shall mean all maps, sketches and layouts as are incorporated in the CONTRACT in order to define broadly the scope and specifications of the work or works, and all reproductions thereof.
- 1.28 PERFORMANCE AND GUARANTEE TESTS shall mean all operational checks and tests required to determine and demonstrate capacity, efficiency and operating characteristics as specified in the Contract documents.
- 1.29 PROJECT designates the aggregate of the Goods and/or Services to be provided by one or more Contractors.

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Quantities – Bills of quantities  
Bills of quantities

Designate the quantity calculations to be taken into account when these calculations are made from detailed or construction drawings, or from work actually performed, and presented according to a jointly agreed breakdown of the Goods and/or Services.

- 1.30 SELLER/SUPPLIER/CONTRACTOR shall mean the person, firm or company with whom PURCHASE ORDER/AWARD OF WORK/CONTRACT is placed/entered into by PURCHASER for supply of equipment, materials and services. The term Seller includes its successors and assigns.
- 1.31 SERVICE shall mean erection, installation, testing, commissioning, provision of technical assistance, training and other such obligations of the Seller covered under the Contract.
- 1.32 SITE designates the land and/or any other premises on, under, in or across which the Goods and/or Services have to be supplied, erected, assembled, adjusted, arranged and/or commissioned.
- 1.33 SPECIFICATIONS shall mean and include schedules, details, description, statement of technical data, performance characteristics, standards (Indian as well as International) as applicable and specified in the Contract.
- 1.34 SUB-CONTRACT shall mean order placed by the Seller, for any portion of the contracted work, after necessary consent and approval of PURCHASER.
- 1.35 SUB-CONTRACTOR shall mean the person named in the CONTRACT for any part of the work or any person to whom any part of the CONTRACT has been sub-let by the SELLER with the consent in writing of the CONSULTANT/PURCHASER and will include the legal representatives, successors, and permitted assigns of such person.
- 1.36 START-UP shall mean the time period required to bring the equipments covered under the Contract from an inactive condition, when construction is essentially complete to the state of readiness for trial operation. The start-up period shall include preliminary inspection and check out of equipment and supporting subsystems, initial operation of the complete equipments covered under the Contract to obtain necessary pre-trial operation data, perform calibration and corrective action, shutdown inspection and adjustment prior to the trial operation period.
- 1.37 TESTS shall mean such process or processes to be carried out by the Seller as are prescribed in the Contract or considered necessary by PURCHASER or his

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representative in order to ascertain quality, workmanship, performance and efficiency of equipment or part thereof.

- 1.38 TESTS ON COMPLETION shall mean such tests as prescribed in the Contract to be performed by the Seller before the Works are taken over by the PURCHASER.
- 1.39 "TEMPORARY WORKS" shall mean all temporary works of every kind required in or about the execution, completion or maintenance of works.
- 1.40 "VALUE OF CONTRACT" or "TOTAL CONTRACT PRICE" shall mean the sum accepted or the sum calculated in accordance with the prices accepted in tender and/or the CONTRACT rates as payable to the CONTRACTOR for the entire execution and full completion of the work, including change order.
- 1.41 "WORKING DAY" means any day which is not declared to be holiday or rest day by the EMPLOYER.
- 1.42 "WEEK" means a period of any consecutive seven days.
- 1.43 "METRIC SYSTEM" - All technical documents regarding the construction of works are given in the metric system and all work in the project should be carried out according to the metric system. All documents concerning the work shall also be maintained in the metric system.

## **2 Seller to Inform**

- 2.1 The Seller shall be deemed to have carefully examined all contract documents to his entire satisfaction. Any lack of information shall not in any way relieve the Seller of his responsibility to fulfill his obligation under the Contract.

## **3 Application**

- 3.1 These General Conditions of Contract (GCC-Goods) shall apply to the extent that they are not superseded by provisions of other parts of the Contract.


## **4 Country of Origin**

- 4.1 For purposes of this Clause "origin" means the place where the Goods were mined, grown or produced, or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

## **5 Scope of Contract**

- 5.1 Scope of the CONTRACT shall be as defined in the PURCHASE ORDER/CONTRACT specifications, drawings and Annexure thereto.
- 5.2 Completeness of the EQUIPMENT shall be the responsibility of the SELLER. Any equipment, fittings and accessories which may not be specifically mentioned in the



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specifications or drawings, but which are usual or necessary for the satisfactory functioning of the equipment (successful operation and functioning of the EQUIPMENT being SELLER's responsibility) shall be provided by SELLER without any extra cost.

- 5.3 The SELLER shall follow the best modern practices in the manufacture of high-grade EQUIPMENT notwithstanding any omission in the specifications. The true intent and meaning of these documents is that SELLER shall in all respects, design, engineer, manufacture and supply the equipment in a thorough workmanlike manner and supply the same in prescribed time to the entire satisfaction of PURCHASER.
- 5.4 The SELLER shall furnish six (6) copies in English language of technical documents, final drawings, preservation instructions, operation and maintenance manuals, test certificates, spare parts catalogues for all equipments to the PURCHASER.
- 5.5 The documents once submitted by the SELLER shall be firm and final and not subject to subsequent changes. The SELLER shall be responsible for any loss to the PURCHASER/CONSULTANT consequent to furnishing of incorrect data/drawings.
- 5.6 All dimensions and weight should be in metric system.
- 5.7 All equipment to be supplied and work to be carried out under the CONTRACT shall conform to and comply with the provisions of relevant regulations / Acts (State Government or Central Government) as may be applicable to the type of equipment/work carried out and necessary certificates shall be furnished.
- 5.8 The Seller shall provide cross sectional drawings, wherever applicable, to identify the spare part numbers and their location. The size of bearings, their make and number shall be furnished.
- 5.9 Specifications, design and drawings issued to the SELLER alongwith RFQ and CONTRACT are not sold or given but loaned. These remain property of PURCHASER or its assigns and are subject to recall by PURCHASER. The SELLER and his employees shall not make use of the drawings, specifications and technical information for any purpose at any time except for manufacture against the CONTRACT and shall not disclose the same to any person, firm or corporate body, without written permission of PURCHASER. All such details shall be kept confidential.
- 5.10 SELLER shall pack, protect, mark and arrange for despatch of EQUIPMENT as per instructions given in the CONTRACT.

## **6 Standards**

- 6.1 The GOODS supplied under the CONTRACT shall conform to the standards mentioned in the Technical Specifications, or such other standards which ensure



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equal or higher quality, and when no applicable standard is mentioned, to the authoritative standard appropriate to the GOODS' country of origin and such standards shall be the latest issued by the concerned institution.

## **7 Instructions, Direction & Correspondence**


- 7.1 The materials described in the CONTRACT are to be supplied according to the standards, data sheets, tables, specifications and drawings attached thereto and/or enclosed with the CONTRACT, itself and according to all conditions, both general and specific enclosed with the contract, unless any or all of them have been modified or cancelled in writing as a whole or in part.
- All instructions and orders to SELLER shall, excepting what is herein provided, be given by PURCHASER.
  - All the work shall be carried out under the direction of and to the satisfaction of PURCHASER.
  - All communications including technical/commercial clarifications and/or comments shall be addressed to PURCHASER and shall always bear reference to the CONTRACT.
  - Invoices for payment against CONTRACT shall be addressed to PURCHASER.
  - The CONTRACT number shall be shown on all invoices, communications, packing lists, containers and bills of lading, etc.

## **8 Contract Obligations**

- 8.1 If after award of the contract, the Seller does not acknowledge the receipt of award or fails to furnish the performance guarantee within the prescribed time limit, the PURCHASER reserves the right to cancel the contract and apply all remedies available to him under the terms and conditions of this contract.
- 8.2 Once a contract is confirmed and signed, the terms and conditions contained therein shall take precedence over the Seller's bid and all previous correspondence.

## **9 Modification in Contract**

- 9.1 All modifications leading to changes in the CONTRACT with respect to technical and/or commercial aspects including terms of delivery, shall be considered valid only when accepted in writing by PURCHASER by issuing amendment to the CONTRACT. Issuance of acceptance or otherwise in such cases shall not be any ground for extension of agreed delivery date and also shall not affect the performance of contract in any manner except to the extent mutually agreed through a modification of contract.
- 9.2 PURCHASER shall not be bound by any printed conditions or provisions in the SELLER's Bid Forms or acknowledgment of CONTRACT, invoices, packing list and other documents which purport to impose any conditions at variance with or supplemental to CONTRACT.

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## **10 Use of Contract Documents & Information**


- 10.1 The Seller shall not, without the PURCHASER's prior written consent, disclose the CONTRACT or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the PURCHASER in connection therewith, to any person other than a person employed by the SELLER in the performance of the CONTRACT. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purpose of such performance.
- 10.2 The SELLER shall not, without the PURCHASER's prior written consent, make use of any document or information enumerated in Article 10.1 except for purpose of performing the CONTRACT.

## **11 Patent Rights, Liability & Compliance of Regulations**

- 11.1 SELLER hereby warrants that the use or sale of the materials delivered hereunder will not infringe claims of any patent covering such material and SELLER agrees to be responsible for and to defend at his sole expense all suits and proceedings against PURCHASER based on any such alleged patent infringement and to pay all costs, expenses and damages which PURCHASER may have to pay or incur by reason of any such suit or proceedings.
- 11.2 The SELLER shall indemnify the PURCHASER against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the GOODS or any part thereof in the PURCHASER's country.
- 11.3 SELLER shall also protect and fully indemnify the PURCHASER from any claims from SELLER'S workmen/employees or their heirs, dependants, representatives, etc. or from any other person/persons or bodies/companies etc. for any acts of commissions or omission while executing the CONTRACT.
- 11.4 SELLER shall be responsible for compliance with all requirements under the laws and shall protect and indemnify completely the PURCHASER from any claims/penalties arising out of any infringements.

## **12 Performance Guarantee**

- 12.1 Within 15 days after the SELLER's receipt of Purchase Order, the SELLER shall furnish Performance Guarantee in the form of Bank Guarantee/Demand Draft / irrevocable Letter of Credit to the PURCHASER, in the form provided in the Bidding Documents, for an amount equivalent to 10% of Contract/Purchase Order Value.
- 12.2 The proceeds of Performance Guarantee shall be appropriated by the PURCHASER as compensation for any loss resulting from the SELLER's failure to complete his obligations under the CONTRACT without prejudice to any of the rights or remedies the PURCHASER may be entitled to as per terms and conditions of CONTRACT. The proceeds of this Performance Guarantee shall also govern the successful

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performance of Goods and Services during the entire period of Contractual Warrantee/Guarantee.

12.3 The performance guarantee shall be denominated in the currency of the CONTRACT.

12.4 The Performance Guarantee shall be valid for the duration of 90 days beyond the expiry of Warrantee/Guarantee period. The Bank Guarantee will be discharged by PURCHASER not later than 6 months from the date of expiration of the Seller's entire obligations, including any warrantee obligations, under the CONTRACT.

### **13 Inspection, Testing & Expediting**

13.1 The PURCHASER or its representative shall have the right to inspect and/or to test the GOODS to confirm their conformity to the CONTRACT specifications. The special conditions of CONTRACT and/or the Technical Specifications shall specify what inspections and tests the PURCHASER requires and where they are to be conducted. The PURCHASER shall notify the SELLER in writing the identity of any representative(s) retained for these purposes.


13.2 The inspections and tests may be conducted on the premises of the SELLER or his sub-contractor(s), at point of DELIVERY and/or at the GOODS' final destination. When conducted on the premises of the SELLER or his sub-contractor (s), all reasonable facilities and assistance including access to the drawings and production data shall be furnished to the inspectors at no charge to the PURCHASER.

13.3 Should any inspected or tested GOODS fail to conform to the specifications, the PURCHASER may reject them and the SELLER shall either replace the rejected GOODS or make all alterations necessary to meet Specifications' requirements, free of cost to the PURCHASER.


13.4 The PURCHASER's right to inspect, test and where necessary reject the GOODS after the GOODS' arrival in the PURCHASER's country shall in no way be limited or waived by reason of the GOODS having previously been inspected, tested and passed by the PURCHASER, or their representative prior to the GOODS shipment from the country of origin.

13.5 The INSPECTOR shall follow the progress of the manufacture of the GOODS under the CONTRACT to ensure that the requirements outlined in the CONTRACT are not being deviated with respect to schedule and quality.

13.6 SELLER shall allow the INSPECTOR to visit, during working hours, the workshops relevant for execution of the CONTRACT during the entire period of CONTRACT validity.

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- 13.7 In order to enable PURCHASER's representatives to obtain entry visas in time, SELLER shall notify PURCHASER two months before assembly, testing and packing of main EQUIPMENT. If requested, SELLER shall assist PURCHASER's representatives in getting visas in the shortest possible time (applicable only in case of foreign order).
- 13.8 SELLER shall place at the disposal of the INSPECTOR, free of charge, all tools, instruments, and other apparatus necessary for the inspection and/or testing of the GOODS. The INSPECTOR is entitled to prohibit the use and dispatch of GOODS and/or materials which have failed to comply with the characteristics required for the GOODS during tests and inspections.
- 13.9 SELLER shall advise in writing of any delay in the inspection program at the earliest, describing in detail the reasons for delay and the proposed corrective action.
- 13.10 ALL TESTS and trials in general, including those to be carried out for materials not manufactured by SELLER shall be witnessed by the INSPECTOR. Therefore, SELLER shall confirm to PURCHASER by fax or e-mail about the exact date of inspection with at least 30 days notice. SELLER shall specify the GOODS and quantities ready for testing and indicate whether a preliminary or final test is to be carried out.
- 13.11 If on receipt of this notice, PURCHASER should waive the right to witness the test, timely information will be given accordingly.
- 13.12 Any and all expenses incurred in connection with tests, preparation of reports and analysis made by qualified laboratories, necessary technical documents, testing documents and drawings shall be at SELLER's cost. The technical documents shall include the reference and numbers of the standards used in the construction and, wherever deemed practical by the INSPECTOR, copy of such standards.
- 13.13 Nothing in Article-13 shall in any way release the SELLER from any warrantee or other obligations under this CONTRACT.
- 13.14 Arrangements for all inspections required by Indian Statutory Authorities and as specified in technical specifications shall be made by SELLER.
- 13.15 **Inspection & Rejection of Materials by consignees**  
When materials are rejected by the consignee, the supplier shall be intimated with the details of such rejected materials, as well as the reasons for their rejection, also giving location where such materials are lying at the risk and cost of the contractor/supplier. The supplier will be called upon either to remove the materials or to give instructions as to their disposal within 14 days and in the case of dangerous, infected and perishable materials within 48 hours, failing which the consignee will either return the materials to the contractor freight to pay or otherwise dispose them off at the contractor's risk and cost. The PURCHASER shall also be entitled to recover handling and storage charges for the period, during

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which the rejected materials are not removed @ 5% of the value of materials for each month or part of a month till the rejected materials are finally disposed off.

#### **14 Time Schedule & Progress Reporting**

##### **14.1 Time Schedule Network/Bar Chart**

14.1.1 Together with the Contract confirmation, SELLER shall submit to PURCHASER, his time schedule regarding the documentation, manufacture, testing, supply, erection and commissioning of the GOODS.

14.1.2 The time schedule will be in the form of a network or a bar chart clearly indicating all main or key events regarding documentation, supply of raw materials, manufacturing, testing, delivery, erection and commissioning.

14.1.3 The original issue and subsequent revisions of SELLER's time schedule shall be sent to PURCHASER.

14.1.4 The time schedule network/bar chart shall be updated at least every second month.

##### **14.2 Progress Trend Chart/Monthly Report**

14.2.1 SELLER shall report monthly to PURCHASER, on the progress of the execution of CONTRACT and achievement of targets set out in time bar chart.


14.2.2 The progress will be expressed in percentages as shown in the progress trend chart attached to the Time Schedule specification.

14.2.3 The first issue of the Progress Trend Chart will be forwarded together with the time bar chart alongwith CONTRACT confirmation.

14.3.1 PURCHASER's representatives shall have the right to inspect SELLER's premises with a view to evaluating the actual progress of work on the basis of SELLER's time schedule documentation.

14.3.2 Irrespective of such inspection, SELLER shall advise PURCHASER, at the earliest possible date of any anticipated delay in the progress.

14.4 Notwithstanding the above, in case progress on the execution of contract at various stages is not as per phased time schedule and is not satisfactory in the opinion of the PURCHASER which shall be conclusive, or SELLER shall neglect to execute the CONTRACT with due diligence and expedition or shall contravene the provisions of the CONTRACT, PURCHASER may give notice of the same in writing to the SELLER calling upon him to make good the failure, neglect or contravention complained of. Should SELLER fail to comply with such notice within the period considered reasonable by PURCHASER, the PURCHASER shall have the option and be at liberty to take the CONTRACT wholly or in part out of the SELLER's hand and make alternative arrangements to obtain the requirements and completion of CONTRACT at the SELLER's risk and cost and recover from the SELLER, all extra cost incurred

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by the PURCHASER on this account. In such event PURCHASER shall not be responsible for any loss that the SELLER may incur, and SELLER shall not be entitled to any gain. PURCHASER shall, in addition, have the right to encash Performance Guarantee in full or part.

## **15 Delivery & Documents**

15.1 Delivery of the GOODS shall be made by the SELLER in accordance with terms specified in the CONTRACT, and the goods shall remain at the risk of the SELLER until delivery has been completed.

15.2 Delivery shall be deemed to have been made:

- a) In the case of FOB Contracts, when the Goods have been put on board the ship, at the specified port of loading and a clean Bill of Lading is obtained. The date of Bill of Lading shall be considered as the delivery date. However, for CFR & CIF Contracts delivery date will be receipt of goods at Indian Port.
- b) In case of FOT despatch point contract (For Indian bidder), on evidence that the goods have been loaded on the carrier and a negotiable copy of the GOODS receipt obtained. The date of LR/GR shall be considered as the date of delivery.
- c) In case of FOT site (for Indian bidders) on receipt of goods by PURCHASER at the designated site(s).

15.3 The delivery terms are binding and essential and consequently, no delay is allowed without the written approval of PURCHASER. Any request concerning delay will be void unless accepted by PURCHASER through a modification to the CONTRACT.

15.4 Delivery time shall include time for submission of drawings for approval, incorporation of comments, if any, and final approval of drawings by PURCHASER.

15.5 In the event of delay in delivery, Price Reduction Schedule as stipulated in Article – 26 shall apply.

15.6 The documentation, in English Language, shall be delivered in due time, in proper form and in the required number of copies as specified in the contract.


15.7 The additional copies of final drawings and instructions will be included in the package of goods, properly enveloped and protected.

15.8 The SELLER should comply with the Packing, Marking and Shipping Documentation Specifications enclosed.

## **16 Transit Risk Insurance**

16.1 All goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery.



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- 16.2 Where delivery is on FOB or CFR basis, marine insurance shall be the responsibility of the Purchaser against the advance information by the contractor with all the details.

Indigenous Bidders : Transit risk insurance till FOT Site shall be arranged and borne by Bidder.

The SELLER shall ensure that in effecting despatch of materials, the primary responsibility of the carriers for safe movement is always retained so that the PURCHASER's interests are fully safeguarded and are in no way jeopardised. The Seller shall furnish the cost of materials against each equipment.

- 16.2 **PURCHASER's Insurance Agent:**  
[The name and address-as mentioned under SCC].

## **17 Transportation**


- 17.1 Where the SELLER is required under the CONTRACT to deliver the GOODS FOB, transport of the GOODS until delivery, that is, upto and including the point of putting the GOODS on board the export conveyance at the specified port of loading, shall be arranged and paid for by the SELLER and the cost thereof shall be included in the Contract price.

Where the SELLER is required under the CONTRACT to deliver the GOODS CFR or CIF, transport of the Goods to the port of discharge or such other point in the country of destination as shall be specified in the CONTRACT shall be arranged and paid for by the SELLER and the cost thereof shall be included in the Contract price.

## **18 Incidental Services**

- 18.1 The Seller may be required to provide any or all of the following services:
- 18.1.1 Performance or supervision of onsite assembly and/or start-up of the supplied Goods.
- 18.1.2 Furnishing tools required for assembly and/or maintenance of the supplied Goods.
- 18.1.3 Performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Seller of any warrantee/guarantee obligations under the Contract.
- 18.1.4 Training of the Purchaser's personnel at the Seller's plant and/or at Site, in assembly, start-up operation, maintenance and/or repair of the supplied Goods at no extra cost. However, Purchaser will bear boarding, lodging & personal expenses of Trainees.
- 18.2 Prices charged by the Seller for the preceding incidental services, shall not exceed the prevailing rates charged to other parties by the Seller for similar services.



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18.3 When required, Seller shall depute necessary personnel for supervision and/or erection of the Equipment at site for duration to be specified by Purchaser on mutually agreed terms. Seller's personnel shall be available at Site within seven days for emergency action and twenty-one days for medium and long-term assistance, from the date of notice given by Purchaser.

18.4 The cost of incidental services shall not be included in the quoted prices. The cost of applicable incidental services should be shown separately in the price schedules.

**19 Spare Parts, Maintenance Tools, Lubricants**

19.1 Seller may be required to provide any or all the following materials and notification pertaining to spare parts manufactured or distributed by the Seller.

19.1.1 Such spare parts as the Purchaser may opt to purchase from the Seller, provided that his option shall not relieve the Seller of any warranty obligations under the Contract, and

19.1.2 In the event of termination of production of the spare parts:

- i) Advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements, and
- ii) Following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings, and specifications of the spare parts, if any when requested.

19.2 Seller shall supply item wise list with value of each item of spare parts and maintenance tools requirements, along with full details of manufacturers/vendors for such spares/maintenance tools for:

19.2.1 The construction, execution, and commissioning.


19.2.2 2 years' operation and maintenance.

19.3 Spare parts shall be new and of first-class quality as per engineering standards/codes, free of any defects (even concealed), deficiency in design, materials and workmanship and also shall be completely interchangeable with the corresponding parts.

19.4 Type and sizes of bearings shall be clearly indicated.

19.5 Spare parts shall be packed for long storage under tropical climatic conditions in suitable cases, clearly marked as to intended purpose.

19.6 A list of special tools and gauges required for normal maintenance and special handling and lifting appliances, if any, for the Goods shall be submitted to Purchaser.

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19.7 Bidders should note that if they do not comply with Clause 19.2 above, their quotation may be rejected.

#### 19.8 Lubricants

19.8.1 Whenever lubricants are required, Seller shall indicate the quantity of lubricants required for the first filling, the frequency of changing, the quantity of lubricants required for the one year's continuous operation and the types of recommended lubricants indicating the commercial name (trademark), quality and grade.

19.8.2 If Seller is unable to recommend specific oil, basic recommended characteristics of the lubricants shall be given.

19.8.3 Seller shall indicate various equivalent lubricants available in India.


#### 20 Guarantee

20.1 All Goods or Materials shall be supplied strictly in accordance with the specifications, drawings, data sheets, other attachments and conditions stated in the Contract.

No deviation from such specifications or alterations or of these conditions shall be made without PURCHASER'S agreement in writing which must be obtained before any work against the order is commenced. All materials supplied by the SELLER pursuant to the Contract (irrespective of whether engineering, design data or other information has been furnished, reviewed or approved by PURCHASER) are guaranteed to be of the best quality of their respective kinds (unless otherwise specifically authorised in writing by PURCHASER) and shall be free from faulty design, workmanship and materials, and to be of sufficient size and capacity and of proper materials so as to fulfill in all respects all operating conditions, if any, specified in the Contract.

If any trouble or defect, originating with the design, material, workmanship or operating characteristics of any materials, arises at any time prior to twelve (12) months from the date of the commercial operation of the Plant for which the materials supplied under the Contract form a part thereof, or twenty four (24) months from the date of last shipment whichever period shall first expire, and the SELLER is notified thereof, SELLER shall, at his own expense and as promptly as possible, make such alterations, repairs and replacements as may necessary to permit the materials to function in accordance with the specifications and to fulfil the foregoing guarantees.

PURCHASER may, at his option, remove such defective materials, at SELLER'S expense in which event SELLER shall, without cost to PURCHASER and as promptly as possible, furnish and install proper materials. Repaired or replaced materials shall be similarly guaranteed by the SELLER for a period of not less than twelve (12) months from the date of replacement/repair.

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If the materials supplied do not meet the specifications and/or not in accordance with the drawings data sheets or the terms of the Contract and rectification is required at site, PURCHASER shall notify the SELLER giving full details of differences. The SELLER shall attend the site within seven (7) days of receipt of such notice to meet and agree with representatives of PURCHASER, the action required to correct the deficiency. Should the SELLER fail to attend meeting at Site within the time specified above, PURCHASER shall immediately rectify the work/materials and SELLER shall reimburse PURCHASER all costs and expenses incurred in connection with such trouble or defect.

## **20.2 PERFORMANCE GUARANTEE OF EQUIPMENT**

20.2.1 SELLER shall guarantee that the performance of the EQUIPMENT supplied under the CONTRACT shall be strictly in conformity with the specifications and shall perform the duties specified under the CONTRACT.

20.2.2 If the SELLER fails to prove the guaranteed performance of the EQUIPMENT set forth in the specification, the SELLER shall investigate the causes and carry out necessary rectifications /modifications to achieve the guaranteed performance. In case the SELLER fails to do so within a reasonable period, the SELLER shall replace the EQUIPMENT and prove guaranteed performance of the new equipment without any extra cost to PURCHASER.

20.2.3 If the SELLER fails to prove the guarantee within a reasonable period, PURCHASER shall have the option to take over the EQUIPMENT and rectify, if possible, the EQUIPMENT to fulfil the guarantees and/or to make necessary additions to make up the deficiency at Seller's risk and cost. All expenditure incurred by the PURCHASER in this regard shall be to SELLER's account.


## **21 Terms of Payment**

21.1 The method of payment to be made to the SELLER under this CONTRACT shall be specified in the Special Conditions of Contract.

21.2 The type(s) of payment to be made to the SELLER under this CONTRACT shall be specified in the Special Conditions of Contract.

21.3 The SELLER's request(s) for payment shall be made to the PURCHASER in writing accompanied by an invoice describing, as appropriate, the Goods delivered and services performed, and by shipping documents submitted, and upon fulfillment of other obligations stipulated in the Contract.

21.4 Payment will be made in the currency or currencies in which the Contract Price has been stated in the SELLER's bid, as well as in other currencies in which the SELLER had indicated in his bid that he intends to incur expenditure in the performance of the Contract and wishes to be paid. If the requirements are stated as a percentage of the bid price alongwith exchange rates used in such calculations these exchange rates shall be maintained.

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**General Notes:**

1. All foreign currency payments to foreign bidder shall be released through an irrevocable Letter of Credit, which shall be opened through Government of India Nationalized Bank and hence shall not be confirmed. In case any bidder insists on confirmation, charges towards confirmation shall be borne by him. L/C shall be established within 30 days after receipt of unconditional acceptance of Letter /Fax of Intent together with Performance Guarantee for 10% of Purchase Order Value.
2. For dispatches on FOT dispatch point (in India) basis, the payment shall be through PURCHASER's bank. Payment through Bank, wherever applicable, shall be released as per normal banking procedures.
3. Payment shall be released within 45 days after receipt of relevant documents complete in all respects.
4. All bank charges incurred in connection with payments shall be to Seller's account in case of Indian bidders and to respective accounts in case of foreign bidders.
5. Unless otherwise specifically stated in bid document, all payments shall be made in the currency quoted.
6. No interest charges for delay in payments, if any, shall be payable by PURCHASER.
7. In case of Indian bidder, variation, if any, on account of customs duty on their built-in- import content, as per terms of bid document, shall be claimed separately by bidder after receipt of goods at site (s). However, any price benefits to the PURCHASER, on account of such variation as per terms specified in the bid document, shall be passed on to the PURCHASER alongwith invoicing itself.
8. Agency commission, if any, to Indian agent for foreign bidders, indicated in prices, shall be paid to the agent in equivalent Indian Rupees on receipt and acceptance of material at site.

**22 Prices**


- 22.1 Prices charged by the SELLER for Goods delivered and services performed under the CONTRACT shall not, with the exception of any price adjustments authorized by the Contract vary from the prices quoted by the SELLER in his bid.

**23 Subletting & Assignment**

- 23.1 The contractor shall not without previous consent in writing of the PURCHASER authority, sublet, transfer, or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever. Provided, nevertheless, that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

**24 Time as Essence of Contract**

- 24.1 The time and date of delivery/completion of the GOODS/SERVICES as stipulated in the Contract shall be deemed to be the essence of the Contract.

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## **25 Delays in The Seller's Performance**

25.1 If the specified delivery schedule is not adhered to or the progress of manufacture or supply of the items is not satisfactory or is not in accordance with the progress schedule the PURCHASER has the right to:

- i) hire for period of delay from elsewhere goods which in PURCHASER's opinion will meet the same purpose as the goods which are delayed, and SELLER shall be liable without limitation for the hire charges; or
- ii) cancel the CONTRACT in whole or in part without liability for cancellation charges. In that event, PURCHASER may procure from elsewhere goods which PURCHASER's opinion would meet the same purpose as the goods for which CONTRACT is cancelled and SELLER shall be liable without limitations for the difference between the cost of such substitution and the price set forth in the CONTRACT for the goods involved; or
- iii) hire the substitute goods vide (i) above and if the ordered goods continue to remain undelivered thereafter, cancel the order in part or in full vide (ii) above.

25.2 Any inexcusable delay by the SELLER or his sub-contractor shall render the SELLER liable, without prejudice to any other terms of the Contract, to any or all of the following sanctions:  
forfeiture of Contract performance guarantee, imposition of price reduction for delay in delivery and termination of the contract for default.

## **26 Price Reduction Schedule for Delayed Delivery**


26.1 Subject to Article -29, if the SELLER fails to deliver any or all of the GOODS or performance of the services within the time period (s) specified in the CONTRACT, the PURCHASER shall, without prejudice to his other remedies under the CONTRACT, deduct from the CONTRACT PRICE, a sum calculated on the basis of the CONTRACT PRICE, including subsequent modifications.

26.1.1 Deductions shall apply as per following formula:

In case of delay in delivery of equipment/materials or delay in completion, total contract price shall be reduced by ½% (half percent) of the total contract price per complete week of delay or part thereof subject to a maximum of 5% (Ten Percent) of the total contract price.

26.2 In case of delay in delivery on the part of Seller, the invoice/document value shall be reduced proportionately for the delay and payment shall be released accordingly.

26.3 In the event the invoice value is not reduced proportionately for the delay, the PURCHASER may deduct the amount so payable by SELLER, from any amount falling due to the SELLER or by recovery against the Performance Guarantee.

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Both seller and PURCHASER agree that the above percentages of price reduction are genuine pre estimates of the loss/damage which the PURCHASER would have suffered on account of delay/breach on the part of the SELLER and the said amount will be payable on demand without there being any proof of the actual loss/or damage caused by such breach/delay. A decision of the PURCHASER in the matter of applicability of price reduction shall be final and binding.

Price reduction schedule on failure of pipe under field hydrotest and/ or during guarantee/ warranty period shall be as follows (for pipe supplier):

Pursuant to General Conditions of Contract as per Volume-I and clause 14 (new) of the Technical Specification, owner shall be reimbursed by the successful bidders for any pipe supplied against this order that fails under field hydrostatic test and/ or during guarantee/ warranty period, if such failure is caused by a defect in pipes which is outside the acceptance limits of the specifications. The reimbursement cost will be the landed cost of the defective pipes including all cost incurred up to delivery thereof at site and shall also include but not limited to cost of all duties, freight, insurance, labor, material, charges for cutting, removing, re-coating, replacement and relaying of defective pipeline including cost of incidental activities as well as losses suffered by MNGL. The recovery cost shall be calculated at actual but will be subject to the minimum values given below. Recovery shall be applied on the actual or minimum pre-determined rate, whichever is higher. The minimum pre-determined rate shall not need any justifications. The minimum pre-determined reimbursement cost of each pipe shall be as under:

i) Rs. 20,00,000/- (Rs. Twenty Lacs only) for bidder quoting in Indian Rupees.


The above cost shall be for each pipe, payable by the vendor to the Owner on demand without necessity of any proof of replacement/ reimbursement cost. Further, in case, the amount payable by the vendor to MNGL become more than what can be adjusted through price reduction, MNGL may recover at its discretion through deduction from any payment due or becomes due to the contractor or by encashing the Bank Guarantee(s) furnished by contractor, the unrecovered part of such payment will be paid by the contractor to MNGL within 15 days of date of notification by MNGL to him.

In the event of conflict between the stipulations of this article and anything contained in the Technical Specification (Material Requisition), the stipulations of this article shall govern.

Necessary tests to establish cause of failure of pipes shall be carried out at Welding Research Institute, Trichi, India and shall be binding on both MNGL and the pipe supplier.

## 27 Rejections, Removal of Rejected Equipment & Replacement



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- 27.1 Preliminary inspection at SELLER's works by INSPECTOR shall not prejudice PURCHASER's claim for rejection of the EQUIPMENT on final inspection at SITE or claims under warranty provisions.
- 27.2 If the EQUIPMENTS are not of specification or fail to perform specified duties or are otherwise not satisfactory the PURCHASER shall be entitled to reject the EQUIPMENT/MATERIAL or part thereof and ask free replacement within reasonable time failing which obtain his requirements from elsewhere at SELLER's cost and risk.
- 27.3 Nothing in this clause shall be deemed to deprive the PURCHASER AND/OR AFFECT ANY rights under the Contract which it may otherwise have in respect of such defects or deficiencies or in any way relieve the SELLER of his obligations under the Contract.
- 27.4 EQUIPMENT rejected by the PURCHASER shall be removed by the Seller at his cost within 14 days of notice after repaying the amounts received against the SUPPLY. The PURCHASER shall in no way be responsible for any deterioration or damage to the EQUIPMENT under any circumstances whatsoever.
- 27.5 In case of rejection of EQUIPMENT, PURCHASER shall have the right to recover the amounts, if any, from any of CONTRACTOR'S invoices pending with PURCHASER or by alternative method(s).

## **28 Termination of Contract**


### **28.1 Termination for Default**

28.1.1 The PURCHASER may, without prejudice to any other remedy for breach of CONTRACT, by written notice of default sent to the SELLER, terminate the CONTRACT in whole or in part:

- A) If the SELLER fails to deliver any or all of the GOODS within the time period(s) specified in the CONTRACT; or
- B) If the SELLER fails to perform any other obligation(s) under the CONTRACT, and
- C) If the SELLER, in either of the above circumstances, does not cure his failure within a period of 30 days (or such longer period as the PURCHASER may authorize in writing) after receipt of the default notice from the PURCHASER.

28.1.2 In the event the PURCHASER terminates the CONTRACT in whole or in part, pursuant to Article 28.1.1, the PURCHASER may procure, upon such terms and in such manner as it deems appropriate, goods similar to those undelivered and the SELLER shall be liable to the PURCHASER for any excess costs for such similar GOODS. However, the SELLER shall continue performance of the CONTRACT to the extent not terminated.



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**28.1.3 In case of termination of CONTRACT herein set forth (under clause 28) except under conditions of Force Majeure and termination after expiry of contract, the VENDOR shall be put under holiday [i.e. neither any enquiry will be issued to the party by MAHARSHRATRA NATURAL GAS LIMITED Against any type of tender nor their offer will be considered by MNGL against any ongoing tender (s) where contract between MNGL and that particular VENDOR (as a bidder) has not been finalized] for three years from the date of termination by MAHARSHRATRA NATURAL GAS LIMITED to such VENDOR.**

**28.2 Termination for Insolvency**

The PURCHASER, may at any time, terminate the CONTRACT by giving written notice to the SELLER, without compensation to the SELLER, if the SELLER becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the PURCHASER.

**28.3 Termination for Convenience**

**28.3.1** The PURCHASER may, by written notice sent to the SELLER, terminate the CONTRACT, in whole or part, at any time for his convenience. The notice of termination shall specify that termination is for the PURCHASER's convenience, the extent to which performance of work under the CONTRACT is terminated and the date upon which such termination becomes effective.

**28.3.2** The GOODS that are complete and ready for shipment within 30 days after the SELLER's receipt of notice of termination shall be purchased by the PURCHASER at the CONTRACT terms and prices. For the remaining GOODS, the PURCHASER may opt:


- a) to have any portion completed and delivered at the CONTRACT terms and prices, and /or
- b) to cancel the remainder and pay to the SELLER an agreed amount for partially completed GOODS and for materials and parts previously procured by the SELLER.

**29 Force Majeure**

**29.1** Shall mean and be limited to the following:

- a) War/hostilities
- b) Riot or Civil commotion
- c) Earthquake, flood, tempest, lightening or other natural physical disaster.
- d) Restrictions imposed by the Government or other Statutory bodies which prevents or delays the execution of the Contract by the SELLER.

The SELLER shall advise PURCHASER/CONSULTANT by a registered letter duly certified by the local Chamber of Commerce or statutory authorities, the beginning and end of the above causes of delay within seven (7) days of the occurrence and cessation of such Force Majeure Conditions. In the event of delay lasting over one month, if arising out of causes of Force Majeure, PURCHASER reserves the right to

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cancel the Contract and the provisions governing termination stated under Article 28.0 shall apply.

For delays arising out of Force Majeure, the SELLER shall not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither PURCHASER/CONSULTANT nor SELLER shall be liable to pay extra costs provided it is mutually established that Force Majeure Conditions did actually exist.


SELLER shall categorically specify the extent of Force Majeure Conditions prevalent in their works at the time of submitting their bid and whether the same have been taken into consideration or not in their quotations. In the event of any force majeure cause, the SELLER or the PURCHASER shall not be liable for delays in performing their obligations under this order and the delivery dates will be extended to the SELLER without being subject to price reduction for delayed deliveries, as stated elsewhere.

### **30 Resolution of Disputes/Arbitration**

- 30.1 The PURCHASER and the SELLER shall make every effort to resolve amicably by direct informal negotiations any disagreement or dispute arising between them under or in connection with the contract.
- 30.2 If, after thirty days from the commencement of such informal negotiations, the PURCHASER and the SELLER have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanism as specified hereunder.
- 30.3 The Contract shall be, in all respects be construed and operated as an Indian Contract and in accordance with Indian Laws as in force for the time being and is subject to and referred to the Court of Law situated at Pune.
- 30.4 Arbitration:  
All disputes, controversies, or claims between the parties (except in matters where the decision of the Engineer-in-Charge is deemed to be final and binding) which cannot be mutually resolved within a reasonable time shall be referred to Arbitration by a sole arbitrator.

The PURCHASER (MNGL) shall suggest a panel of three independent and distinguished persons to the Seller to select any one among them to act as the sole Arbitrator.

In the event of failure of the Seller to select the Sole Arbitrator within 30 days from the receipt of the communication suggesting the panel of arbitrators, the right of selection of Sole Arbitrator by the other party shall stand forfeited and the PURCHASER shall have discretion to proceed with the appointment of the Sole

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Arbitrator. The decision of the PURCHASER on the appointment of Sole Arbitrator shall be final and binding on the parties.

The award of the Sole Arbitrator shall be final and binding on the parties and unless directed/awarded otherwise by the Sole Arbitrator, the cost of arbitration proceedings shall be shared equally by the parties. All matters relating to this contract are subject to the exclusive jurisdiction of the courts situated at Pune. Subject to the above, the provisions of (Indian) Arbitration & Conciliation Act, 1996 and the rules framed thereunder shall be applicable. All matters relating to this contract are subject to the exclusive jurisdiction of the Courts situated at Pune, Maharashtra, India.

### **31 Governing Language**

31.1 The Contract shall be written in English language as specified by the PURCHASER in the Instruction to Bidders. All literature, correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in English language. Printed literature in other language shall only be considered, if it is accompanied by an English translation. For the purposes of interpretation, English translation shall govern and be binding on all parties.

### **32 Notices**

32.1 Any notice given by one party to the other pursuant to the Contract shall be sent in writing or by telegram or fax, telex/cable confirmed in writing.

32.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

### **33 Taxes & Duties**

33.1 A foreign Seller shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the PURCHASER's country.


33.2 A domestic Seller shall be entirely responsible for all taxes, duties, license fees etc. incurred until the delivery of the contracted goods to the PURCHASER. However, Sales Tax and Excise duty on finished products shall be reimbursed by PURCHASER.

33.3 Customs duty payable in India for imported goods ordered by PURCHASER on foreign Seller shall be borne and paid by PURCHASER.

33.4 Any income tax payable in respect of supervisory services rendered by foreign Seller under the Contract shall be as per the Indian Income Tax Act and shall be borne by SELLER.

### **34 Books & Records**

34.1 SELLER shall maintain adequate books and records in connection with Contract and shall make them available for inspection and audit by PURCHASER/CONSULTANT or their authorized agents or representatives during

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the terms of Contract until expiry of the performance guarantee. Fixed price (lumpsum or unit price) Contract will not be subject to audit as to cost except for cost reimbursable items, such as escalation and termination claims, transportation and comparable requirements.

### **35 Permits & Certificates**

35.1 SELLER shall procure, at his expense, all necessary permits, certificates and licenses required by virtue of all applicable laws, regulations, ordinances and other rules in effect at the place where any of the work is to be performed, and SELLER further agrees to hold PURCHASER and/or CONSULTANT harmless from liability or penalty which might be imposed by reason of any asserted or established violation of such laws, regulations, ordinances or other rules. PURCHASER will provide necessary permits for SELLER's personnel to undertake any work in India in connection with Contract.

### **36 General**

36.1 In the event that terms and conditions stipulated in the General Conditions of Contract should deviate from terms and conditions stipulated in the Contract, the latter shall prevail.

36.2 Losses due to non-compliance of Instructions Losses or damages occurring to the PURCHASER owing to the SELLER's failure to adhere to any of the instructions given by the PURCHASER in connection with the contract execution shall be recoverable from the SELLER.

#### **36.3 Recovery of sums due**


All costs, damages or expenses which the PURCHASER may have paid, for which under the CONTRACT SELLER is liable, may be recovered by the PURCHASER (he is hereby irrevocably authorized to do so) from any money due to or becoming due to the SELLER under this Contract or other Contracts and/or may be recovered by action at law or otherwise. If the same due to the SELLER be not sufficient to recover the recoverable amount, the SELLER shall pay to the PURCHASER, on demand, the balance amount.

36.4 Payments, etc. not to affect rights of the PURCHASER No sum paid on account by the PURCHASER nor any extension of the date for completion granted by the PURCHASER shall affect or prejudice the rights of the PURCHASER against the SELLER or relieve the SELLER of his obligation for the due fulfillment of the CONTRACT.

#### **36.5 Cut-off Dates**

No claims or correspondence on this Contract shall be entertained by the PURCHASER after 90 days after expiry of the performance guarantee (from the date of final extension, if any)

#### **36.6 Paragraph heading**

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The paragraph heading in these conditions shall not affect the construction thereof.

**37 Import License**

37.1 No import license is required for the imports covered under this document.

**38 FALL CLAUSES**

38.1 The price charged for the materials supplied under the order by the supplier shall in no event exceed the lowest price at which the supplier or his agent/principal/dealer sells the materials of identical description to any persons/organizations including the Purchaser or any department of the Central Govt. or any Deptt. Of a State Govt. or any Statutory Undertaking of the Central or State Govt. as the case may be, during the currency of the order.

38.2 If at any time during the said period, the supplier, or his agent/principal/dealer, as the case may be, reduces the sale price, sells or offers to sell such materials to any persons/organizations including the Purchaser or any Deptt. Of Central Govt. or State Govt. as the case may be, at a price lower than the price chargeable under the order, he shall forthwith notify such reduction or sale or offer of sale to the Purchase Authority who has issued this order and the price payable under the order for the materials supplied after the date of coming into force of such reduction or sale or offer of sale shall stand correspondingly reduced.

The above stipulation will, however, not apply to:


- a) Exports by the Contractor/Supplier or
- b) Sale of goods as original equipment at prices lower than the prices charged for normal replacement
- c) sale of goods such as drugs which have expiry dates.

38.3 The supplier shall furnish the following certificate to the concerned Paying Authority alongwith each bill for payment for supplies made against this order:

"I/We certify that there has been no reduction in sale price of the items/goods/materials of description identical to those supplied to the MNGL under the order herein and such items/ goods/materials have not been offered/sold by me/us to any person/organizations including the Purchaser or any Deptt. Of Central Govt. or any Deptt. Of State Govt. or any Statutory Undertaking of the Central or State Govt. upto the date of bill/during the currency of the order whichever is later, at a price lower than the price charged to the MNGL under the order.

Such a certificate shall be obtained, except for quantity of items/goods/materials categories under sub-clause (a), (b) & (c) of sub-para 38.2 above, of which details shall be furnished by the supplier.

**39 Publicity & Advertising**

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39.1 Seller shall not without the written permission of PURCHASER make a reference to PURCHASER or any Company affiliated with PURCHASER or to the destination or the description of goods or services supplied under the contract in any publication, publicity, or advertising media.

**40 Repeat Order:**

40.1 PURCHASER reserves the right, within 6 months of order to place repeat order upto 50% of the total order value without any change in unit price or other terms and conditions.

**41 Limitation of Liability:**

41.1 Notwithstanding anything contrary contained herein, the aggregate total liability of Seller under the Agreement or otherwise shall be limited to 100% of Agreement / Order price. However, neither party shall be liable to the other party for any indirect and consequential damages, loss of profits or loss of production.

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**SECTION - IIIA  
FORMS AND FORMATS**





**MAHARASHTRA NATURAL  
GAS LIMITED**

**Tender for automation of 300 CNG Stations, along  
with AMC for the period of 5 years in the GA's of  
Pune, Nashik, Sindhudurg, Ramanagara, Nanded and  
Nizamabad GA of MNGL**

**Bid Doc. No. MNGL/CP/2025-26/35**

**FORM F-1**  
**BIDDER'S GENERAL INFORMATION**  
**(Information must be provided on bidder's letterhead)**

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

1-1 Bidder Name: \_\_\_\_\_

1-2 Number of Years in Operation: \_\_\_\_\_

1-3 Address of Registered Office: \_\_\_\_\_

City \_\_\_\_\_ District \_\_\_\_\_

State \_\_\_\_\_ PIN \_\_\_\_\_

1-4 Operation Address  
(If different from above): \_\_\_\_\_

City \_\_\_\_\_ District \_\_\_\_\_

State \_\_\_\_\_ PIN \_\_\_\_\_

1-5 Telephone Number: \_\_\_\_\_  
(Area Code) (Telephone Number)

1-6 Mobile Number, if any \_\_\_\_\_

1-7 E-mail address: \_\_\_\_\_

1-8 Website: \_\_\_\_\_

1-9 Fax Number: \_\_\_\_\_  
(Area Code) (Telephone Number)

1-10 ISO Certification, if any {If yes, please furnish details} \_\_\_\_\_


1-11 Whether Supplier / Manufacturer  
/ Dealer / Trader / Service Provider \_\_\_\_\_

1-12 Types of material / service provided \_\_\_\_\_

1-13 Bank's Name: \_\_\_\_\_

1-14 Bank's Branch: \_\_\_\_\_

1-15 Branch Code: \_\_\_\_\_

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- 1-16 Bank account Number: \_\_\_\_\_
- 1-17 Account type: \_\_\_\_\_
- 1-18 IFSC Code: \_\_\_\_\_
- 1-19 MICR Code: \_\_\_\_\_
- 1-20 Type of Firm: Proprietary/ Partnership/ PVT/Public Ltd.: \_\_\_\_\_
- 1-21 If others, please specify \_\_\_\_\_
- 1-22 **Details of Directors/ Proprietors/ Partners** \_\_\_\_\_


**(Kindly attach separate sheets giving details for names of directors/proprietors and their stakes) along with the supporting documents.**

- 1-23 PAN No.: \_\_\_\_\_
- 1-24 EPF No.: \_\_\_\_\_
- 1-25 MSME category, if applicable (i) Type of Enterprises: \_\_\_\_\_
- (ii) Social Category of Enterprises: \_\_\_\_\_
- (iii) Gender (Male/Female/Transgender/NA): \_\_\_\_\_
- 1-26 GST Registration no.  
(If registered) \_\_\_\_\_
- 1-27 If unregistered (Reason)
- a) Turnover threshold
- b) Providing exemption goods/services
- c) Others (specify) \_\_\_\_\_
- (SIGNATURE OF BIDDER WITH SEAL)

Note:

- 1 The above-required information is required on the bidder's letterhead.
- 2 Bidders must submit supporting documents for the above details including the following:
  - a. PAN Card copy
  - b. GST certificate copy (of the same state as the office address mentioned above)
  - c. Cancelled cheque of the bank account mentioned above

(SIGNATURE OF BIDDER WITH SEAL)

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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**FORM F-2  
BID BOND PROFORMA**

Bank Guarantee No.:

Date:

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Dear Sir,

Having examined the Conditions of Contract and Specifications including Addenda Nos. (Insert Numbers) the receipt of which is hereby duly acknowledged, we the undersigned, offer to supply and deliver (Description of Goods and Services) in conformity with the said Drawings, Conditions of Contract and specifications for the same for (as quoted in price bid) or such other sums as may be ascertained in accordance with the Schedule of Prices.

We undertake, if our bid is accepted, complete delivery of ..... as agreed and specified in the IFB document. If our bid is accepted, we will obtain the guarantee of a Bank in a sum not exceeding (10)% of the Contract / Delivery Order price for the due performance of the Contract.

We agree to abide by this bid for a period of 4(four) months from the date fixed for bid opening under Instructions to Bidders and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We have enclosed Bid Security in the form of Demand Draft/ Bank Guarantee in line with Cl. 17 of ITB for \_\_\_\_\_ (amount in figure & words) valid for 6 (six) months' period as per the requirement of bid document.

Until a formal contract is prepared and executed, this bid, together with your written acceptance thereof in your notification of award (Fax of Intent / Purchase Order) shall constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any bid, you may receive.

Dated this                      Day of                      2025


SEAL AND SIGNATURE

In the capacity of Duly authorized to sign bid for and on behalf of:

(SIGNATURE OF WITNESS)

WITNESS NAME:

ADDRESS:

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**PROFORMA FOR BANK GUARANTEE FOR EARNEST MONEY DEPOSIT / BID  
SECURITY**

(To be stamped in accordance with the Stamp Act)

Ref: ..... Bank Guarantee No. ....  
Date .....


To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Dear Sir(s),  
In accordance with Letter Inviting Tender under your reference No.  
\_\_\_\_\_ M/s  
\_\_\_\_\_ having their Registered/ Head Office at  
\_\_\_\_\_ (hereinafter called the Tenderer) wish to participate in the  
said tender for \_\_\_\_\_.

As an irrevocable Bank Guarantee against Earnest Money for the amount of  
\_\_\_\_\_ is required to be submitted by the Tenderer as a condition precedent for  
participation in the said tender which amount is liable to be forfeited on the happening of  
any contingencies mentioned in the Tender Document.

We, the \_\_\_\_\_ Bank at \_\_\_\_\_  
having our Head Office \_\_\_\_\_ (Local  
Address) guarantee and undertake to pay immediately on demand without any recourse to  
the tenderers by  
Maharashtra Natural Gas Ltd. the amount \_\_\_\_\_ without any  
reservation, protest, demur and recourse. Any such demand made by MNGL, shall be  
conclusive and binding on us irrespective of any dispute or difference raised by the  
Tenderer.

This guarantee shall be irrevocable and shall remain valid up to \_\_\_\_\_ [this date  
should be 6 months after the date finally set out for closing of tender]. If any further  
extension of this guarantee is required, the same shall be extended to such required period  
on receiving instructions from M/s \_\_\_\_\_ whose behalf this  
guarantee is issued.

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this \_\_\_\_\_ day of \_\_\_\_\_ 2025 at \_\_\_\_\_.

WITNESS:

(SIGNATURE)  
(NAME)


(OFFICIAL ADDRESS)

(SIGNATURE)  
(NAME)

Designation with Bank Stamp  
Attorney as per  
Power of Attorney No. \_\_\_\_\_  
Date: \_\_\_\_\_

#### **INSTRUCTIONS FOR FURNISHING BID-GUARANTEE / BANK GUARANTEE**

1. The Bank Guarantee by bidders will be given on non-judicial stamp paper as per stamp duty applicable. The non-judicial stamp paper should be in the name of the issuing bank. In case of foreign bank, the said banks guarantee to be issued by its correspondent bank in India on requisite non-judicial stamp paper.
2. The expiry date as mentioned in bid document should be arrived at by adding 2 months to the date of expiry of the bid validity unless otherwise specified in the Bid Documents.
3. The bank guarantee by bidders will be given from bank as specified in ITB
4. A letter along with SWIFT Statement from the issuing bank of the requisite Bank Guarantee confirming that said bank guarantee/ all future communication relating to the Bank Guarantee shall be forwarded to the Employer at its address as mentioned at ITB.
5. Bidders must indicate the full postal address of the bank along with the bank's E-mail/ Fax from where the earnest money bond has been issued.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F – 3 A**

**ANNUAL TURNOVER**


**Bidder must fill in this form**

Annual Turnover data for the last 3 years:

Year	Last three financial year	Amount (in INR)
Year 1:		
Year 2:		
Year 3:		

1. The information supplied should be the Annual Turnover of the bidder
2. A brief note should be appended describing thereby details of turnover as per audited results.

**SEAL AND SIGNATURE OF THE BIDDER**

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F – 3 B  
FINANCIAL STATUS**

**Bidder must fill this form**


**FINANCIAL DATA FOR LAST AUDITED FINANCIAL YEAR**

Description	Amount (in INR)
1. Current assets	
2. Current Liabilities (including secured and un-secured short-term loans & working capital loans)	
3. Working Capital (Current Assets-Current liabilities)	
4. Net Worth Owners funds (Paid up share capital and Free Reserves & Surplus) (NW)	

1. Attached are copies of the audited balance sheets, including all related notes and income statement and Auditor's report, for the last Audited Financial year, as indicated above, complying with the following conditions.
  - All such documents reflect the financial situation of the bidder
  - Historic financial statements must be audited by a certified accountant.
  - Historic financial statements must be complete, including all notes to the financial statements.
  - Historic financial statements must correspond to accounting periods already completed and audited (no statement for partial periods shall be requested or accepted)

**SEAL AND SIGNATURE OF BIDDER**



 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-4**  
**CHECK LIST FOR AGREED TERMS AND CONDITIONS**

Sr. No.	DESCRIPTION	BIDDER'S CONFIRMATION
1.	Price & Delivery Basis	FOT- MNGL Store basis at various Locations
2.	Firm & Fixed Prices (As per Tender document)	Accepted
3.	Supply as per scope defined in the Tender documents	Included
4.	All Taxes, duties, levies, etc. included in price	Included
5.	Packing & Forwarding is Included in unit price	Included
6.	Delivery period (As per Tender document)	Accepted
7.	Guarantee/ Warranty Clause	Accepted
8.	Price Reduction Schedule as per Tender document	Accepted
9.	Term of Payments (As per Tender document)	Accepted
10.	Contract-Cum-Equipment Performance Bank Guarantee to be submitted as per tender document	Accepted
11.	Firm Price - during the entire duration of contact (As per Tender document)	Accepted
12.	Validity of bid & bid security	Accepted
13.	Bid Security (EMD) & Details of EMD	Submitted
14.	Price Quoted as per SOR.	Yes
15.	Deviation / exception Form 5	Yes
16.	Defect Liability Period/Warranty	Accepted
17.	Goods & Service Tax	Included
18.	General & Special Conditions of Contract & Technical terms and conditions of the Tender	Accepted

Name of the Bidder : M/s.


Signature :

Name :

Designation :

Date :

Seal:

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-5  
DEVIATION FORM  
(On Bidder's letterhead)**

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045


Notes:

- 1) BIDDER may give a consolidated list of deviations/clarifications/comments for all sections of the bid documents which for an appropriate offer are considered unavoidable by him.
- 2) Deviations/clarifications mentioned elsewhere in the offer shall not be binding on the MNGL and any such deviations if indicated elsewhere other than this form will render the offer non-responsive and shall be liable to be rejected.
- 3) BIDDER shall state the reason for the deviations in the remark column.
- 4) Only the deviations listed herein, in conjunction with the original Tender shall constitute the contract document for the award of the job to the BIDDER.
- 5) Any clarification raised by the Purchaser/ Consultant should be resolved within 10 days failing which the bid is liable for rejection.

Sec No./ Clause. No.	Page No.	Requirements as per tender	Deviation by Bidder	Clarification/ Comments by Bidder	Remarks
1)					
2)					
3)					
4)					
5)					
6)					

The bidder confirms that all clauses of the tender document, which are not listed above are fully complied by the bidder.

(Signature of the bidder)

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-6  
DECLARATION ON TENDER DOCUMENT DOWNLOADED  
(on Bidder's letterhead)**

No.

Date:

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045


Subject:

Sir,

We hereby confirm that we have read each page of the subject tender document along with Corrigendum & Reply to bidder's queries thoroughly and understood the complete Scope of Work and other terms & conditions. We hereby also confirm that tender terms & conditions are acceptable to us and any deviation other than mentioned in deviation Form F-5 is not to be taken into account.

Yours faithfully,

Signature  
Name & Designation  
For and on behalf of

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-7  
PROFORMA FOR LETTER OF AUTHORITY**

No.

Date:

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Subject:

Sir,

We \_\_\_\_\_ hereby authorise  
following representative (s) to attend the Un-Priced Bid opening and Priced Bid opening  
against above Bidding Document:

1. Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_


2. Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_

**We confirm that we shall be bound by all and whatsoever our representative(s) shall  
commit.**

Yours faithfully,

Signature  
Name & Designation  
For and on behalf of

Note: This letter of authority should be on the letterhead of the bidder and should be  
signed by a person competent and having the power of attorney to bind the bidder.

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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**FORM F-8  
DECLARATION  
(on Bidder's letter head)**


To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Subject:

We confirm that we are not under any liquidation, court receivership or similar proceedings.

We also confirm that we have not been put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s) for any forgery, Corrupt or Fraudulent Practice or unethical behaviour.


SEAL AND SIGNATURE OF BIDDER

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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**Form F-9**

**DETAILS OF LITIGATION  
(on Bidder's letterhead)**

Bidder shall furnish details of litigation cases of the bidder during the last 5 years if any, in this Form.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-10  
COVERING LETTER  
(ON LETTERHEAD)**

Date:

To,

Subject: Certificate regarding.....

Dear Sir,

We..... (name of the Statutory Auditor/Chartered Accountant)  
are            the            Statutory            Auditor/Chartered            Accountant            of  
M/s..... (name of the bidder).

We hereby confirm that we have issued following certificate:

- 1.
- 2.
- 3.

Thanking You.


Place: (Signature)

Date: Name of Authorised Signatory  
Membership No.

Encl.: As above

Note: Submission of this form is Mandatory for all the bidders.



 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F- 11**

**FORMAT FOR STATUTORY AUDITOR'S / CHARTERED ACCOUNTANT  
CERTIFICATE FOR FINANCIAL CAPABILITY OF THE BIDDER**

**(For supply of Goods/Works/Services)**

We have verified the Annual Accounts and other relevant records of M/s.....  
(Name of the bidder) and certify the following:

**A. ANNUAL TURNOVER OF LAST 3 YEARS:**

Year	Amount (Currency)
Year 1:	
Year 2:	
Year 3:	

**B. FINANCIAL DATA FOR LAST AUDITED FINANCIAL YEAR:**


Description	Year
	Amount (Currency)
1. Currency Assets	
2. Current liabilities	
3. Working capital (Current assets-current liabilities)	
4. Net worth (Paid up share capital and free reserves & surplus)	

Name of Audit Firm:  
Chartered Accountant  
Date:

[Signature of Authorized signatory]  
Name:  
Designation:  
Seal:  
Membership no.  
UDIN No.

**Instructions:**

- The financial year would be the same as one normally followed by the bidder for its Annual Report.
- The bidder shall provide the audited annual financial statements as required for this Tender Document. Failure to do so would result in the personnel being considered as non-responsive.
- For the purpose of this Tender document, (i) Annual Turnover shall be "Sale value/Operating Income" (ii) Working capital shall be "Current Assets Less Current

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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Liabilities" and (iii) Net Worth shall be "Paid up share capital and Free reserves & Surplus"

**FORM F-12**  
**FORMAT FOR CERTIFICATE FROM STATUTORY AUDITOR FOR DETAILS OF SIMILAR  
GOODS/ WORK/ SERVICES SUPPLIED/ DONE DURING PAST 10  
YEARS**

Sr. no.	Description of the goods/works/services	LOA/PO /WO no. & date	Full proposal, address & phone nos. of client Name, designation & address of engineer/officer-in-charge (for cases other than purchase)	Value of Contract /Order (Specify Currency amount)	Date of Commencement of work/service s or supply of goods	Scheduled completion time(months) delivery schedule	Date of actual completion /supply	Reasons for delay in execution, if any	Project cost
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

**Place:**

**[Sign. Of authorized signatory of bidder]**


**Date:**

**Name:**

**Designation:**

**Instructions:**

1. Copies of letter of awards/order/work orders and completion certificate (in case of works/services) or IRN/Proof of delivery (in case of supplies, if applicable) to be enclosed.
2. The supply/work/services completed earlier than 5 years need not be indicated here.
3. The list of supply/ work/ services not of similar nature need not be indicated here. Failing to comply aforementioned instructions may lead to rejection of bid.
4. Bidders are expected to provide details in respect of each order in this Annex. The orders cited must comply with the bid evaluation criteria specified in Tender Document. Details provided in this section is intended to serve as a backup for information provided in Offer/Quotation. Bidder should also refer to the instructions below.
5. A separate sheet should be filled for each LOA/work order/ purchase order.

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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6. Certificate from the bidder's statutory auditors must be furnished in the format below for LOA/Work Order/Purchase Order mentioned above (separately for each order).
7. It may be noted that in the absence above certificates, the details would be considered inadequate and could lead to the bid being considered ineligible for further evaluation.

**Certificate from the Statutory Auditor regarding Supply of Goods/Works/Services**

Based on its books of accounts and other published information authenticated by it, {this is to certify that LOA/PO/WO no. .... dated.....was awarded to ..... (name of the bidder) by.....(name of the client) to execute.....((name of the supply/work/service). The Supply/ works/services commenced on ..... (date) was/is likely to be completed on.....(date, if any). It is certified that the total value of contract/order executed by..... (name of bidder) was..... (specify currency & amount) and executed value was.....(specify currency & amount).

Name of Audit Firm:

[Signature of authorized signatory]

Chartered Accountant:


Date:

Name:

Designation:

Seal:

Membership No.:

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORM F-13**

**FORMAT FOR SUPPLY RECORDS FOR MEETING BEC**

Sr. no.	Purchase Order no.	Purchaser Name	Ordered Quantity	Supplied Quantity	IRN no./ DCN/ Taxable Invoice no.	Sr. No. of pages
(1)	(2)	(3)	(4)	(5)	(6)	(7)

**Bidder shall submit this form along with the relevant documents with properly numbered.**

**For tenders having various items/ parts, the bidder is to submit a separate format for each item/ part quoted.**

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**Form F-14  
FORMAT FOR BIDDER'S PRE-BID QUERIES**


To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

**Subject:**

Sr. no.	Section / Tender page no.	Clause no.	Subject	Bidder's Query

**NOTE: The Pre-Bid Queries may be sent by e-mail, before the pre-bid meeting due date, to MNGL. An editable copy of queries may be enclosed while sending signed pre-bid queries.**

SEAL AND SIGNATURE OF BIDDER

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**Form F-15**

**TECHNO-COMMERCIAL PROPOSAL**

(To be filled serial-wise on the e-tendering portal bid floor in the provided format)


Wherever remarks are required, bidders are advised to ensure that sufficient information has been provided and remarks such as “attached”, “enclosed”, “submitted” or other such terms alone should be avoided.

Sr.	Requirement	Response
	<b>General Information</b>	
1	Complete Bidder Organization Name	
2	Date of Registration	
3	Company Address(es) in India	
4	No. of years in business	
5	Type of Firm (Proprietary / Partnership / Private Ltd. / Public Ltd.)	
6	Details of Directors / Proprietors / Partners	
7	Phone no. of contact person	
8	Email ID of contact person	
9	GST registration number	
	<b>Technical BEC</b>	
1	As defined in tender document	Agree
	<b>Details in support of Technical BEC</b>	
1	Any one past reference client (Company Name)	
2	Reference client's PO / work order / Agreement no. and date of award	
3	Reference client's Completion certificate with clear mention of PO / work order / Agreement no., awarded value/ qty. & executed value/ qty.	
	<b>Financial BEC</b>	
1	Bidder's turnover for immediate preceding financial year FY _____ (as per tender requirement).	
2	Bidder's turnover for second to last preceding financial year FY _____ (as per tender requirement).	
3	Bidder's turnover for third to last preceding financial year FY _____ (as per tender requirement).	
4	Bidder's net worth for preceding financial year FY _____ (as per tender requirement). Should be positive.	
5	Bidder's working capital for preceding financial year FY _____ (as per tender requirement).	
	<b>Commercial Terms and Conditions</b>	
1	Bidder accepts to keep the bid valid for a period of 4 months from the date of opening of techno-commercial bid	Agree
2	Bidder to submit the original copy of EMD / Bid Security (if applicable) required against tender document within the stipulated time.	Agree

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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3	EMD / Bid Security DD/BG no. / MSME/NSIC certificate no. and date	
4	Bidder accepts to quote the prices as per SOR enclosed with this tender document	Agree
5	Prices quoted by the bidder shall remain firm, fixed and valid for entire contractual period	Agree
6	Prices quoted by the bidder shall be inclusive of all taxes, duties, levies, fees, insurance, etc.	Agree
7	Bidder understands and accepts the complete scope of work as defined in the tender document	Agree
8	Bidder accepts the contractual validity period as per tender	Agree
9	Bidder accepts the terms of payment as per tender	Agree
10	Bidder accepts to submit the Performance Bank Guarantee(s) as per tender provisions	Agree
11	Bidder accepts the Price Reduction Schedule and other penalties as mentioned in the tender document	Agree
12	Bidder accepts the General / Special / Technical Terms & Conditions of the tender	Agree
13	Bidder accepts all statutory compliances against tender	Agree
14	Bidder has read and accepts the tender document in toto	Agree
15	Any deviation from the tender document sought by the bidder is listed separately in Form-5 only	Agree
16	All the bidders must ensure adequacy and sufficiency of their document while submitting bid in all respects. Bid shall include all documents confirming to the tender terms and conditions, BEC and the tender specifications in toto failing which their bids are liable to be rejected.	Agree



 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**DOCUMENTS TO BE UPLOADED ON E-TENDER PORTAL**


Sr.	Document Header Name	Document Description
1	Covering Letter/Forwarding Letter	Covering Letter/ Forwarding Letter
2	Bid Signatory PoA / Board Resolution	Power of attorney of the signatory to the bid offer on non-judicial stamp paper / Board resolution of a company for authorized signatory.
3	Form-1	Bidder's General Details/Information as per appended format
4	Form-2	Bid Security (EMD) as per format Form F-2
5	Form-3A & 3B	Certificate for financial capability of the bidder as per appended format. In case bidder's working capital is lower than that required as per Tender BEC, letter from bidder's bank showing availability of credit to cover inadequacy of working capital to be attached with this Form-14
6	Form-4	Agreed Terms & Conditions
7	Form-5	Deviation/ Exceptions as per appended format.
8	Form-6	Declaration as per appended format.
9	Form-7	Letter of authority in favour of any one or two of Bidder's executives having authority to attend the un-priced and price bid opening as per the appended format.
10	Form -8	Declaration for bidder not under Liquidation, etc. (on Bidder's letterhead)
11	Form-9	Information regarding any current litigation in which the bidder is involved in Form F-9.
12	Form-10,11 & 12 Certificates	Certificates as per appended Form- F- 10, 11 & 12
13	Form 13	Supply Records
14	Form 15	Techno-Commercial Proposal as per form 15
15	Copy of GST	Copy of GST (Goods & Service Tax), ESI, PF, PAN registration Certificates
16	Other Documents for Technical BEC Eligibility	Any other documents to show compliance of Technical BEC
17	Corrigenda and Other Docs	Copy of all addenda / corrigenda, if any, along with required documents as stated therein, duly signed and stamped. (In case no addendum / corrigendum has been issued against this tender document, then the bidder may upload a letter stating that "No addendum / corrigendum has been issued against this tender document").

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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Notes:

1. Bidder may attach any other docs, not in above list but relevant to this tender, at the specified link on the e-tendering portal.
2. Bidder must upload the file as asked above on e-tender portal in .pdf format by keeping the file name as provide in the column "*Document Header Name*" above only.
3. All pages of the bid offer to be signed and stamped by an authorised representative (as described in bid document) of the bidder.
4. Bidder must ensure the numbering of all pages submitted in bid document. Further total number of pages submitted in bid document must be mentioned in the covering letter of bid submitted.

**Bidders must upload the unpriced SOR marked "Quoted/ Unquoted" for each item as per Excel (named "*Unpriced SOR*") provided on the e-tender portal along with applicable GST rate (in percentage only) and HSN code. If there is any discrepancy observed between the HSN code/ GST rate in unpriced SOR and priced bid, then the GST rate as per the unpriced SOR or as agreed during technical-commercial queries shall be considered for evaluation. MNGL may also take necessary clarifications from bidders quoting HSN code or GST rate inconsistent with other bidders or the previous contract.**

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**Form F-17**  
**CONTRACT PERFORMANCE BANK GUARANTEE**  
**(To be stamped in accordance with Stamp Act)**

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045


Dear Sir,

M/s \_\_\_\_\_ have been awarded the work of \_\_\_\_\_ for Maharashtra Natural Gas Ltd., Pune vide Purchase Order No. \_\_\_\_\_ dated \_\_\_\_\_.

The Contracts conditions provide that the CONTRACTOR shall pay a sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) as full Contract Performance Guarantee in the form therein mentioned. The form of payment of Contract Performance Guarantee includes guarantee executed by Nationalized Bank, undertaking full responsibility to indemnify M/s. Maharashtra Natural Gas Ltd., Pune in case of default.

The said \_\_\_\_\_ has approached us and at their request and in consideration of the premises we having our office at \_\_\_\_\_ have agreed to give such guarantee as hereinafter mentioned.

1. We \_\_\_\_\_ hereby undertake and agree with you that if default shall be made by M/s \_\_\_\_\_ in performing any of the terms and conditions of the tender or in payment of any money payable to Maharashtra Natural Gas Ltd. we shall on demand pay without any recourse to the contractor to you in such manner as you may direct the said amount of Rupees \_\_\_\_\_ only or such portion thereof not exceeding the said sum as you may from time to time require.
2. You will have the full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said \_\_\_\_\_ and to enforce or to forbear from endorsing any powers or rights or by reason of time being given to the said \_\_\_\_\_ which under law relating to the sureties would but for provision have the effect of releasing us.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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3. Your right to recover the said sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) from us in manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s \_\_\_\_\_ and/ or that any dispute or disputes are pending before any officer, tribunal or court.
4. The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or changes of constitution or insolvency of the said but shall in all respects and for all purposes be binding and operative until payment of all money due to you in respect of such liabilities is paid.
5. This guarantee shall be irrevocable and shall remain valid up to \_\_\_\_\_. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instruction from M/s \_\_\_\_\_ on whose behalf this guarantee is issued.
6. The Bank Guarantee's payment of an amount is payable on demand and in any case within 48 hours of the presentation of the letter of invocation of Bank Guarantee. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the jurisdiction of Pune or High Court of Mumbai.
7. We have power to issue this guarantee in your favor under Memorandum and Articles of Association and the undersigned has full power to do under the Power of Attorney dated \_\_\_\_\_ granted to him by the Bank.

Yours faithfully,


\_\_\_\_\_ Bank

By its Constituted Attorney


Signature of a person duly  
authorized to sign on behalf of  
the Bank.

#### **INSTRUCTIONS FOR FURNISHING PERFORMANCE GUARANTEE**

1. The Bank Guarantee by successful bidder(s) will be given on non-judicial stamp paper as per stamp duty applicable. The non-judicial stamp paper should be in name of the issuing bank. In case of foreign bank, the said bank guarantee to be issued by its correspondent bank in India on requisite non-judicial stamp paper and place of bid to be considered as Pune.
2. The bank guarantee by bidders will be given from bank as specified in ITB.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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3. A letter along SWIFT Statement from the issuing bank of the requisite Bank Guarantee confirming that said bank guarantee and all future communication relating to the Bank Guarantee shall be forwarded to Employer
4. All the Bank Guarantees should be submitted along with SWIFT message against this tender.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**Form F-18**

**FORMAT FOR CERTIFICATE FROM BANK  
IF BIDDER'S WORKING CAPITAL IS INADEQUATE/NEGATIVE**

(To be provided on Bank's letterhead)

Date:

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Dear Sir,

This is to certify that M/s ..... (Name of the bidder with address)  
(Hereinafter referred to as Customer) is an existing customer of our Bank.

The Customer has informed that they wish to bid for MNGL's Tender no.  
..... Dated ..... for ..... (Name  
of the supply/work/services/consultancy) and as per the terms of the said Tender they have  
to furnish a certificate from their Bank confirming the availability of line of credit.

Accordingly M/s ..... (Name of the Bank with address) confirms  
availability of line of credit to M/s ..... (Name of the bidder) for at least an  
amount of Rs. \_\_\_\_\_

It is also confirmed that the net worth of the Bank is more than Rs.100 Crores (or  
Equivalent USD) and the undersigned is authorized to issue this certificate.

Yours truly


For ..... (Name & address of Bank)

(Authorized signatory)

Name of the signatory:

Designation:

Stamp

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**Form F-19**  
**E-Banking Mandate Form**  
(To be issued on vendor's letter head)

1. Vendor/customer Name:
2. Vendor/customer Code:
3. Vendor /customer Address:
4. Vendor/customer e-mail id:
5. Particulars of bank account
  - a) Name of Bank
  - b) Name of branch
  - c) Branch code:
  - d) Address:
  - e) Telephone number:
  - f) Type of account (current/saving etc.)
  - g) Account Number:
  - h) RTGS IFSC code of the bank branch
  - i) NEFT IFSC code of the bank branch
  - j) 9-digit MICR code

I/We hereby authorize MNGL to release any amount due to me/us in the bank account as mentioned above. I/We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or lost because of incomplete or incorrect information, we would not hold the MNGL responsible.

(Signature of vendor/customer)

**BANK CERTIFICATE**


We certify that ----- has an Account no. ----- with us and we confirm that the details given above are correct as per our records.

Bank stamp

Date

(Signature of authorized officer of bank)



 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**F – 20**  
**[APPLICABLE FOR DOMESTIC TENDERS]**  
**PACKING, MARKING AND SHIPPING INSTRUCTIONS**


The Packing, Marking, Shipping and Documentation for Goods shall be as follows:

- a) The SUPPLIER shall provide such Packing of GOODS as is required to prevent their damage or deterioration during transit to their final destination as indicated in the CONTRACT. The Packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the GOODS final destination and the absence of heavy handling facilities at all points in transit.
- b) The packing, markings and documentation within and outside the packages, shall comply strictly with such special requirements as shall be expressly provided for in the documents.
- c) SUPPLIER shall comply with all applicable prescriptions in the specifications. Lack of relevant information and/or documents shall not absolve the SUPPLIER of his responsibilities.
- d) Supplier shall ensure that consignments destined for different project sites as detailed in Purchase Order are packed separately and marked clearly.

**1.0 SPECIFICATIONS FOR GOODS BEING PROCURED INDIGENOUSLY**

**1.1 Packing**

- 1.1.1 The packing specifications incorporated herein are supplementary to the internal and external packing methods and standards as per current general rules of IRCA Goods Tariff Part I. All packaging shall be done in such a manner as to reduce volume as much as possible. Fragile articles should be packed with special packing materials depending on the type of materials.
- 1.1.2 Items shipped in bundles must be securely tied with steel wire or strapping. Steel reinforcing rods, bars, pipes, structural members etc. shall be bundled in uniform lengths and the weight shall be within the breaking strength of the securing wire or strapping.
- 1.1.3 All delicate surface on equipment's/materials should be carefully protected and painted with protective paint/compound and wrapped to prevent rusting and damage.
- 1.1.4 All mechanical and electrical equipment and other heavy articles shall be securely fastened to the case bottom and shall be blocked and braced to avoid any displacement/shifting during transit.

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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- 1.1.5 Attachments and spare parts of equipment and all small pieces shall be packed separately in wooden cases with adequate protection inside the case and wherever possible should be sent along with the main equipment. Each item shall be suitably tagged with identification of main equipment, item denomination and reference number of respective assembly drawing. Each item of steel structure and furnaces shall be identified with two erection markings with minimum lettering height of 15 mm. Such markings will be followed by the connection number in indelible ink/ paint. A copy of the packing list shall accompany the material in each package.
- 1.1.6 All protrusions shall be suitably protected by providing a cover comprising of a tightly bolted wooden disc on the flanges.
- 1.1.7 Wherever required, equipment/materials/instruments shall be enveloped in polythene bags containing silica gel or similar dehydrating compound.
- 1.1.8 All pipes and tubes of stainless steel, copper, etc., shall be packed in wooden case or crates irrespective of their size.
- 1.1.9 Pipes with threaded or flanged ends shall be protected with suitable caps/covers, before packing.
- 1.1.10 Detailed packing list in waterproof envelope shall be inserted in the package together with equipment/material. One copy of the detailed packing list, shall be fastened outside of the package in waterproof envelope and covered by metal cover.
- 1.1.11 The supplier shall be held liable for all damages or breakages to the goods due to the defective or insufficient packing as well as for corrosion due to insufficient protection.
- 1.1.12 Packaged equipment or material showing damage, defects or shortages resulting from improper packaging material or packing procedures or having concealed damage or shortages, at the time of unpacking, shall be to the supplier's account.
- 1.2 Marking**
- 1.2.1 Each package shall be marked on three sides with proper paints/indelible waterproof ink as follows:

(OWNER)  
PROJECT  
(DESTINATION)


Purchase order No. \_\_\_\_\_

Net Wt. \_\_\_\_\_ Kgs.

Gross Wt. \_\_\_\_\_ Kgs.

Dimensions \_\_\_\_\_ X \_\_\_\_\_ X \_\_\_\_\_ CMS.

Package No. (S. No. of total Packages) \_\_\_\_\_

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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Supplier's name\_\_\_\_\_

- 1.2.2 Additional marking such as 'HANDLE WITH CARE' 'THIS SIDE UP' 'FRAGILE' or any other additional indications for protection and safe handling shall be added depending on the type of material.
- 1.2.3 Specific marking with white paint for 'SLINGING' and 'CENTRE OF GRAVITY' should be provided for all heavy lifts weighing 5 Tones and above.
- 1.2.4 In case of bundles/bags or other packages, wherever marking cannot be stenciled, the same shall be embossed on metal or similar tag and wired securely at two convenient points.

### 1.3 Dispatch

- (a) Dispatch of materials shall be made in accordance with the relevant terms of the CONTRACT FORM. Any change in mode of transport shall be resorted to only after prior approval in writing. SUPPLIER shall ensure dispatch of GOODS immediately after they are inspected and released and shall intimate status of dispatch by fax to
  - General Manager (C&P), MNGL, Pune
  - Respective consignee fax nos. at site (to be indicated in Purchase Order).
- (b) Dispatch by Road
  - (i) The SUPPLIER shall be responsible for dispatch of materials through a reliable Bank approved transport company unless, the Transport Company is named by PURCHASER.
  - (ii) The SUPPLIER shall ensure with Transport Company the delivery of materials within a reasonable transit period. SUPPLIER shall also obtain from transporter particulars of Lorry Number, transporter's Challan Number, destination of Lorry (if transshipment is involved), Transporter's Agent at destination, if any, etc. and intimate same following: -
    - General Manager (C&P), MNGL, Pune
    - Respective consignee fax nos. at site (to be indicated in Purchase Order).
- (c) Shipment by Air
 

Whenever SUPPLIER is instructed by the PURCHASER or its representative to airfreight any material, the SUPPLIER shall take prompt action for the same. Immediately after air shipment is effected, the SUPPLIER shall intimate by Fax the details of Airway Bill number and date, Flight number, number of packages etc. to the OWNER'S and PURCHASER'S authorities at destination Airport City. Details of MNGL's agents shall be intimated later.
- (d) Advance Information

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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Immediately after a shipment is made SUPPLIER shall send advance information such as the particulars of materials, value, Purchase Order Number, date of dispatch, Railway receipt Wagon Number/ GOODS Consignment note number, Truck number, name of transport company and their destination Office/ Associate's address etc., by way of Fax to following:

- General Manager (C&P), MNGL, Pune
- Respective consignee fax nos. at site (to be indicated in Purchase Order).

(e) **Transmission of Dispatch Documents**


SUPPLIER shall, within 48 hours of the dispatch of the GOODS depending upon the payment terms of the CONTRACT FORM either negotiate through PURCHASER'S Bankers or forward direct to PURCHASER at respective consignee address by Registered Post the following Documents in Original.

- (i) Two copies of the SUPPLIER invoice showing descriptions of the GOODS, Quantity, unit price and total amount.
- (ii) Delivery Note/Railway Receipt/Truck Receipt.
- (iii) Manufacturer's/Supplier's Guarantee Certificate
- (iv) Inspection Certificate issued by the PURCHASER/CONSULTANT and/or its representative and the SUPPLIER'S factory inspection report. Copies of the above documents shall be sent to the following addresses:

A M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045  
Ph. No. – 020 25611000  
Email – [gasaid@mngl.in](mailto:gasaid@mngl.in)

B Office In Charge  
M/s. Maharashtra Natural Gas Ltd.,  
Respective MNGL Site(s) address. (The Bidder shall request for add.  
15 days in advance before dispatch)

- (f) The SUPPLIER shall be responsible for any delay in clearance of the Consignment at destination and consequent wharfage/demurrage, if any, due to delay in transmittal of the Lorry/Railway receipt Consignment Note, etc.

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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**FORMAT FOR TENDER ACCEPTANCE LETTER**

(To be given on Company Letterhead)

Date:

To,  
M/s. Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 2<sup>nd</sup> Floor,  
Baner Road, Baner, Pune – 411045

Sub.: Acceptance of Terms & Conditions of Tender.


Tender Reference No.:

Name of Tender / Work.:

Dear Sir / Madam,

1. I/ We have downloaded/obtained the tender document(s) for the above-mentioned 'Tender/Work' from the website (s) namely: \_\_\_\_\_ as per your advertisement, given in the above-mentioned website(s).
2. I / We hereby certify that I/we have read the entire terms and conditions of the tender documents from Page No. \_\_\_\_\_ to \_\_\_\_\_ (including all documents like annexure(s), schedule(s), etc.), which form part of the contract agreement and I/we shall abide hereby by the terms/conditions/clauses contained therein.
3. The corrigendum(s) issued from time to time by your department/organization too have also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the tender conditions of the above-mentioned tender document(s) / corrigendum(s) in its totality/entirety.
5. I / We do hereby declare that our Firm has not been put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s).
6. I / We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason thereof summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,  
(Signature of the Bidder, with Official Seal)

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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### FORMAT CONTRACT AGREEMENT

Contract Agreement for the work of..... of Maharashtra Natural Gas Limited made on ----- between ..... hereinafter called the "CONTRACTOR" (which term shall unless excluded by or repugnant to the subject or context include its successors and permitted assignees) of the one part and MAHARASHTRA NATURAL GAS LIMITED hereinafter called the "EMPLOYER" (which term shall, unless excluded by or repugnant to the subject or context include its successors and assignees) of the other part.


#### WHEREAS

- A. The EMPLOYER being desirous of having provided and executed certain work mentioned, enumerated or referred to in the Tender Documents including Letter Inviting Tender, General Tender Notice, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, Plans, Time Schedule of completion of jobs, Schedule of Rates, Agreed Variations, other documents has called for Tender.
- B. The CONTRACTOR has inspected the SITE and surroundings of WORK specified in the Tender Documents and has satisfied himself by careful examination before submitting his tender as to the nature of the surface, strata, soil, sub-soil and ground, the form and nature of site and local conditions, the quantities, nature and magnitude of the work, the availability of labor and materials necessary for the execution of work, the means of access to SITE, the supply of power and water thereto and the accommodation he may require and has made local and independent enquiries and obtained complete information as to the matters and thing referred to, or implied in the tender documents or having any connection therewith and has considered the nature and extent of all probable and possible situations, delays, hindrances or interferences to or with the execution and completion of the work to be carried out under the CONTRACT, and has examined and considered all other matters, conditions and things and probable and possible contingencies, and generally all matters incidental thereto and ancillary thereof affecting the execution and completion of the WORK and which might have influenced him in making his tender.
- C. The Tender Documents including the Notice Letter Inviting Tender, General Conditions of Contract, Special Conditions of Contract, Schedule of Rates, General Obligations, SPECIFICATIONS, DRAWINGS, PLANS, Time Schedule for completion of Jobs, Letter of Acceptance of Tender and any statement of agreed variations with its enclosures copies of which are hereto annexed form part of this CONTRACT though separately set out herein and are included in the expression "CONTRACT" wherever herein used.

#### AND WHEREAS

The EMPLOYER accepted the Tender of the CONTRACTOR for the provision and the execution of the said WORK at the rates stated in the schedule of quantities of the work and finally approved by EMPLOYER (hereinafter called the "Schedule of Rates") upon the terms and subject to the conditions of CONTRACT.

NOW THIS AGREEMENT WITNESSETH AND IT IS HEREBY AGREED AND DECLARED AS FOLLOWS: -

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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1. In consideration of the payment to be made to the CONTRACTOR for the WORK to be executed by him, the CONTRACTOR hereby covenants with EMPLOYER that the CONTRACTOR shall and will duly provide, execute and complete the said work and shall do and perform all other acts and things in the CONTRACT mentioned or described or which are to be implied there from or may be reasonably necessary for the completion of the said WORK and at the said times and in the manner and subject to the terms and conditions or stipulations mentioned in the contract.
2. In consideration of the due provision execution and completion of the said WORK, EMPLOYER does hereby agree with the CONTRACTOR that the EMPLOYER will pay to the CONTRACTOR the respective amounts for the WORK actually done by him and approved by the EMPLOYER at the Schedule of Rates and such other sum payable to the CONTRACTOR under provision of CONTRACT, such payment to be made at such time in such manner as provided for in the CONTRACT.

A N D

3. In consideration of the due provision, execution and completion of the said WORK the CONTRACTOR does hereby agree to pay such sums as may be due to the EMPLOYER for the services rendered by the EMPLOYER to the CONTRACTOR, such as power supply, water supply and others as set for in the said CONTRACT and such other sums as may become payable to the EMPLOYER towards the controlled items of consumable materials or towards loss, damage to the EMPLOYER'S equipment, materials construction plant and machinery, such payments to be made at such time and in such manner as is provided in the CONTRACT.

It is specifically and distinctly understood and agreed between the EMPLOYER and the CONTRACTOR that the CONTRACTOR shall have no right, title or interest in the SITE made available by the EMPLOYER for execution of the works or in the building, structures or work executed on the said SITE by the CONTRACTOR or in the goods, articles, materials etc., brought on the said SITE (unless the same specifically belongs to the CONTRACTOR) and the CONTRACTOR shall not have or deemed to have any lien whatsoever charge for unpaid bills will not be entitled to assume or retain possession or control of the SITE or structures and the EMPLOYER shall have an absolute and unfettered right to take full possession of SITE and to remove the CONTRACTOR, their servants, agents and materials belonging to the CONTRACTOR and lying on the SITE.

The CONTRACTOR shall be allowed to enter upon the SITE for execution of the WORK only as a licensee simpliciter and shall not have any claim, right, title or interest in the SITE or the structures erected thereon and the EMPLOYER shall be entitled to terminate such license at any time without assigning any reason.

The materials including sand, gravel, stone, loose, earth, rock etc., dug up or excavated from the said SITE shall, unless otherwise expressly agreed under this CONTRACT, exclusively belong to the EMPLOYER and the CONTRACTOR shall have no right to claim over the same and such excavation and materials should be disposed off on account of the EMPLOYER according to the instruction in writing issued from time to time by the ENGINEER-IN-CHARGE.

In Witness whereof the parties have executed these presents in the day and the year first above written.





**MAHARASHTRA NATURAL  
GAS LIMITED**

**Tender for automation of 300 CNG Stations, along  
with AMC for the period of 5 years in the GA's of  
Pune, Nashik, Sindhudurg, Ramanagara, Nanded and  
Nizamabad GA of MNGL**

**Bid Doc. No. MNGL/CP/2025-26/35**

Signed and delivered for and on  
on behalf of EMPLOYER.

Signed and Delivered for and  
on behalf of the CONTRACTOR.

MAHARASHTRA NATURAL GAS LIMITED

\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

**IN PRESENCE OF TWO WITNESSES**

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_


\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_


Place: \_\_\_\_\_

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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**SECTION – IV  
BREIF AGREED TERMS & CONDITIONS**

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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### **BRIEF SUMMARY OF AGREED TERMS AND CONDITIONS**

Following shall be duly filled in and should be returned by the bidder along with each copy of Unpriced Part of Bid / Offer:


Sl. No.	Description	Bidder's Confirmation
1	<b>Bidder's details:</b> a) Name b) Full address c) Tel. No. d) Fax No. e) E-mail f) State / UT where Registered Office of Company is located g) State / UT where Manufacturing Facilities of the Company is located h) Name and Designation of the person signing the Bid	
2	<b>In case the bidder is not manufacturer:</b> a) Name b) Full address c) Tel. No. d) Fax No. e) E-mail f) Name and Designation of the contact person	
3	<b>The followings are to be enclosed along with the bid:</b> a) Power of Authority of the person signing the bid b) Letter of Authority of the person attending the bid opening. c) In case bidder is not manufacturer: Letter of authority from the manufacturer that they will meet the commitment of the bidder and supply the material in time, as required.	
4	Indicate Country of origin of offered GOODS	
5	Indicate dispatch point (Place of dispatch)	
6	<b>Bid Security Details:</b> a) Name and Address of Issuing Bank: b) Security No. & Date: c) Value (Rs. _____) d) Validity (Valid Minimum for 6 (Six) months from the final date of submission of offer e) Details of Issuing Bank i) Name: ii) Full Address: iii) Tel. No.: iv) Fax. No.: v) E-mail: vi) Name & Designation of the contact person	

 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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7	<b>Validity of Bid:</b> {Valid minimum for Four (4) months from the final date of submission of offer.}	
8	a) Please confirm that the scope of work is complete as per tender requirement.	
	b) If reply to (a) is 'No', have all 'Exception & Deviation' been furnished in the format attached with bid document.	
	c) Confirm there are no 'Exception & Deviation' other than those indicated as (b) above and if indicated in offer elsewhere the same shall be considered 'NULL & VOID'.	
9	<b>Delivery Period / Completion period:</b> Confirm your acceptance of delivery period completion period as per requirement Specified in bid Document in 'Time Schedule' on FOT Project Site Basis to be reckoned from date of Purchase Order (PO).	
10	<b>Currency of Offer:</b>	
	a) Please indicate the currency in which the offer is submitted. (for foreign bidder US Dollar for foreign component and / or Indian Rupee).	
	b) For Domestic bidder in Indian Rupees c) Please confirm that currency once quoted shall not be permitted to be changed.	
11	<b>Correspondence Language:</b> a) Confirm that all correspondences will be in English language only.	
12	<b>Price:</b>	
	a) Ensure and confirm that unit prices Quoted in 'Price Schedule', (i.e. Schedule of Rates) on FOT Site Basis.	
	b) Confirm that price quoted are as per 'Price Format' given in tender document without any change.	
	c) Confirm that quoted prices will remain firm and fixed till complete execution of the order. Purchase Order (PO), placed within offer validity, shall be considered as 'Notification of Award of Contract'.	
	d) Confirm that the tender document is carefully studied & understood and have taken its full consideration in the quoted prices.	
	e) Confirm that Blank SOR submitted with un-priced part of the bid contains the followings	
	i) Each 'Cell' of the schedule has been marked "Quoted" or "Not Quoted" and none of the 'Cell' has been left blank.	
	ii) All information on the top of the SOR or at the 'Note' of the SOR has been provided in totality.	
13	<b>Spares (Article – 19 of GCC):</b> Confirm that 2 years Spares if required in Bid Document, has been quoted on FOT Site and or FOB port of exit Basis and	

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	Freight charges have also been indicated separately.	
14	<b>Freight Charges:</b> <b>For Indian bidder</b> -Ensure & confirm that firm freight charges up to Project Site has been quoted separately for each item in SOR.	
15	<b>Transit Insurance and all other insurances:</b> a) Transit Insurance and all other insurance shall not be arranged by the Purchaser. Confirm that Insurance charges have been included in Quoted Price.	
16	<b>Goods &amp; Service Tax (GST) for Indian bidders:</b> Indicate rate of taxes & duties applicable, as quoted in price schedule a) Goods & Service Tax	
	b) Confirm that GST indicated above is what have been indicated in blanked SOR and also in Priced SOR submitted.	
	c) In case of Discrepancy, rate indicated here shall be considered for bid evaluation. However, order will be placed on the lower one. Difference will be borne and paid by bidder.	
17	<b>Taxes &amp; Duties for Indian bidders:</b> All taxes, duties, levies, License fee etc. incurred until delivery of the contracted goods, shall be borne, and paid by the bidder. However, Goods & Service Tax on finished products shall be reimbursed by the Owner (limited to provisions in the quoted price as per bid document).  The statutory variation in taxes & duties (payable on finished product) if any, within the contractual delivery period shall be to the Owner account. Further, variation in basic charge on Goods & Service Tax within contractual delivery schedule, shall be borne and paid by the Owner. (However, limited to provision in bid document).	
18	<b>Goods &amp; Service Tax for Indian bidders:</b> a) Indicate present rate of terminal Goods & Service Tax (GST) applicable on the supplies and as quoted in price schedule. In case, Bid Document calls for Spares, (Mandatory/2 years) where, generally more than one rate of GST is applicable then such rates as considered in offer are to be indicated in the itemized Spare parts list.	
	b) If there is any variation in Goods & Service Tax at the time of supplies for any reason, other than statutory, including due to turnover, confirm the same will be borne by bidder.	
	c) It is noted and confirmed that statutory variation in GST within contractual delivery shall be to Owner's account.	
	d) If GST is presently not applicable, confirm whether the same will be borne by bidder in case it becomes leviable later.	
	e) In case (b) or (d) is not acceptable, indicate maximum rate of	


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	GST chargeable (same shall be considered by Owner for price evaluation & comparison).	
19	<b>Price Reduction Schedule:</b> a) Confirm acceptance of Price Reduction Schedule (PRS) as per clause 26 of GCC and modified as per SCC i) For delay in completion/ delivery beyond contractually agreed delivery schedule as specified in the Bid Document. ii) for deficiency in performance & services as per provision of Bid Document. The invoice shall be submitted for the amount duly reduced to the extent of PRS. Otherwise, purchaser / owner reserve right to deduct the same.	
	b) Confirm in case of delay in delivery beyond CDD, any new or additional or increase in taxes and duties imposed after contractual delivery the same shall be to Bidder's account.	
20	<b>Terms of Payment as specified in Special conditions of Contracts:</b> a) Confirm acceptance of terms of payment. b) It is noted and confirmed that deviations to 'Terms & Conditions of Payment' may lead to rejection of offer, as Owner considers fit. c) All the Deviation have been indicated in 'Exception & Deviation' format (including annexure, if any) and have not been repeated in the bid/offer and if repeated, the same shall be considered " Null & Void"	
21	<b>Guarantee / Warrantee:</b> Confirm that the GOODS shall be guaranteed against defective materials/workmanship etc. for a period of 24 months from the last Shipment or 12 months from the commissioning date, whichever is earlier, as per Guarantee/warranty conditions of Bid Document.	
22	<b>Contract-cum-Performance BG:</b> Confirm that Contract-cum-Equipment-Performance Bank Guarantee (CPBG) for 10% of Purchase Order Value shall be furnished as per provision of bid document, valid for 3 months beyond the expiry of Guarantee/Warranty or Defect Liability Period & AMC, as applicable as per terms of Bid Document.	
23	<b>Inspection (Article – 13 of GCC):</b> a) Confirm acceptance to inspection requirement as per Bid Document. b) As inspection & certification of all goods may also be conducted by OWNER. Confirm there shall be no extra charges, since all personal & incidental expenses of Owner's Inspectors shall be borne by the Owner.	
24	<b>Part order:</b> Confirm acceptance to PART ORDER. In case of part ordering any value of part ordering, charges if quoted lumpsum and/or	

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	applicable to more than one item, shall be prorated on value basis.	
25	<b>Quantity Variation:</b> PURCHASER reserves the right at the time of award of ORDER to increase or decrease by up to 20% the quantity of GOODS specified in the Material Requisition, without any change in unit price or other terms and conditions. Variation beyond this limit will be subject to mutual agreement between the PURCHASER and the Seller.	
26	<b>Advance Payment:</b> Please note that No Advance payment shall be made by Purchaser / Owner	
27	<b>MISCELLANEOUS:</b> a) Confirm that all Bank charges associated with Bidder's Bank shall be borne by Bidder. b) Confirm that all documents, as per Article -10 of ITB 'Documents comprising after by Bidder', have been enclosed. c) Confirm that owner reserves the right to make any change in the terms & conditions of the Bid Document and to reject any or all bids including those received late or incomplete.	
28	<b>Declaration by Bidder:</b> a) Confirm acceptance in toto of the Terms & Conditions contained in the bid document. Deviation, if any, have been listed in 'Exception & Deviation' format. b) Confirmed that all the terms & conditions have been indicated in this format (including annexure, if any) and have not been repeated in the bid elsewhere. It is noted and confirmed that Terms & Conditions indicated elsewhere including any Printed Terms & Conditions, shall not be considered by Owner. c) Confirm that any of the Directors of bidder is not a relative of any Director of Owner or the Bidder is a firm in which any Director of Owner or his relative is a partner or the Bidder is a private company in which any Director of Owner is a member or Director. d) Confirm that you have not been put on Black / Holiday list by MNGL / MoP&NG / Oil Public Sector Enterprise(s). If you have been banned delisted, then this fact must be clearly stated. e) Confirm that bidder is not under litigation including arbitration for 20 years. i) If answer is No than confirm that complete details of litigation and / or arbitration have been furnished in the offer.	

Bidder Signature:  
Name:  
Designation & Stamp:


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## VOLUME II OF II

### C O N T E N T

Sl. No.	Description
SECTION - V	SPECIAL CONDITIONS OF CONTRACT (SCC)
SECTION - VI	SCOPE OF WORK / TECHNICAL SPECIFICATIONS
SECTION - VII	UNPRICED SCHEDULE OF RATES



 <b>MAHARASHTRA NATURAL GAS LIMITED</b>	<b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b>  <b>Bid Doc. No. MNGL/CP/2025-26/35</b>
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## SECTION - V

### SPECIAL CONDITIONS OF CONTRACT (SCC)

#### 1.0 DEFINITIONS & INTERPRETATION

In addition to meaning ascribed to certain initial capitalized terms in "GCC", following initial capitalized terms shall have the meaning as ascribed to such term hereunder. In case any term defined hereunder is also defined in Section -(GCC), the meaning ascribed to such term hereunder shall prevail:

##### 1.1 Definitions

1.1.1 Bid Document shall mean documents issued to the Bidder pursuant to document listed in ITB.

1.1.2 Effective date shall mean the date on which Seller's obligations will commence and that will be the date of Purchase Order (PO).

##### 1.2 Interpretations


1.2.1 Where any portion of the GCC is repugnant to or at variance with any provisions of the SCC then, unless a different intention appears, the provisions of the SCC shall be deemed to govern the provisions of the GCC and SCC provisions shall prevail to the extent of such repugnancy, or variations exist.

1.2.2 In contract documents unless otherwise stated specifically, the singular shall include the plural and vice versa wherever the context so requires.

1.2.3 Notwithstanding the sub-division of the Contract Documents into separate sections and volumes, every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with and into the Agreement so far as it may be practicable to do so.

1.2.4 All headings, subtitles and marginal notes to the clauses of the GCC, SCC or to the Specifications or to any other part of the Bid Document are solely for the purpose of giving a concise indication and not a summary of the contents thereof, and they shall never be deemed to be part thereof or be used in the interpretation of construction thereof.

1.2.5 The terms fully capitalized and / or initial capitalized shall be interchangeable and shall have the meaning as assigned to fully capitalized term or initial capitalized term.

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- 1.2.6 Except the obligation of payment to Seller, Purchaser may discharge all other Purchaser's obligations. In Bid Document, at all such places where obligations are confined to Purchaser alone such provision to read as Purchaser's obligation to the extent the context so mean / require.

## 2.0 SELLER'S SCOPE

- 2.1 The scope shall be as defined in the Scope of Work.

## 3.0 DURATION OF CONTRACT

- 3.1 The duration of contract shall be **Seven (07)** years from the date of issuance of SO/NOTIFICATION OF AWARD. Rates will be firm and fixed during the contract period as described below.

Supply: Supply of materials required shall be completed in lots within 1 year from the date of issuance of SO/NOTIFICATION OF AWARD as per instruction of Owner & site requirement.

**Supply – 6 months for Supply & 6 months for Erection, Installation, Testing, FAT, SAT, commissioning of complete Automation system as defined in tender document.**

- 3.2 The duration for comprehensive maintenance shall be limited to following:

### 3.2.1 5 years after defect liability period.

- 3.3 Comprehensive Maintenance service shall be after defect liability period. The rates as given in Service order for Supply, Erection / Installation/ Services and Comprehensive Maintenance shall be valid for the contract duration as mentioned above.


- 3.4 Work shall be executed as per instruction of owner & owner decision shall be final.

## 4.0 Payment Terms

### Payment against Supply, Erection / Installation & Commissioning Services

- **50% (Fifty Percent) Payment of invoice value:** Shall be released on receipt of materials at MNGL's stores against submission of material receipt certificate issued by owner, bill of entry / Goods Receipt, manufacturer's test certificates, invoice, packing list, insurance policy, inspection release note, dispatch clearance issued by the Owner and Bank Guarantee.

- **40% (Thirty percent) payment of invoice value:** Shall be released on completion of Installation & testing.

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- **10% (Ten percent) payment of invoice value:** Shall be released on completion of Commissioning and Go-Live of the complete project.

**Payment against Comprehensive Maintenance:** 100% (One Hundred Percent) payment will be released against monthly invoices after completion of monthly comprehensive maintenance.

**4.3 Mode of Payment**

4.3.1 Payment will be released through Account Payee Cheque or through E-payment

**4.4 Deduction at Source**

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

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

**4.5 Paying Authority**

**Chief Financial Officer**  
Maharashtra Natural Gas Ltd.,  
Pride Purple Coronet, 3rd Floor,  
Baner Road, Baner,  
Pune - 411045

**5. PACKING AND FORWARDING**


5.1 The seller, wherever applicable shall after proper painting, pack and crate all goods for sea / air / rail / road transportation in a manner suitable to tropical humid climatic region in accordance with the internationally accepted practices and in such a manner so as to protect it from damage and deterioration, in transit by sea or air or road or rail and during storage at the storehouse till the time of issuance to erection contractor. The Seller shall be held responsible for all damages due to improper packing. The seller shall ensure sizing or packing of all consignments in such a way that availability of carrier and / or rail / road route is properly taken into consideration.

**6.0 DISPATCH CLEARANCE**

6.1 Seller shall obtain dispatch clearance from the Purchaser prior to each dispatch, which will be issued on receipt of copy of Inspection Release Note.

**7.0 INDEPENDENT SELLER**

7.1 It is expressly understood and agreed that Seller is an independent party and that neither the Seller / its personnel are servants, agents or employees of the Purchaser nor the seller has any kind of interest in other sellers.

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**8.0 LIEN**

8.1 Seller shall ensure that the Scope of Supply supplied under the Agreement shall be free from any third party. In the event of such claims by any party, Seller shall at his own cost defend, indemnify and hold harmless Purchaser or its authorized representative from such disputes of title / liens, costs, consequences etc.

**9.0 TRANSIT & STORAGE RISK INSURANCE**

9.1 In partial modification to GCC Clause 16.0, All transit risk insurance from dispatch point to bidder's storage facility as Project site shall be arranged and borne by Supplier.

9.2 Bidder shall also obtain suitable storage risk insurance for storage of all pipes through out storage and preservation of pipes at bidder's storage facility (Project site).

**10.0 FALL CALUSE**

10.1 Clause 38 of GCC stands deleted.

**11.0 RECOVERY OF GOODS AND SERVICE TAX**

11.1 In case, the statutory variation entitles the Purchaser to recover the amount (irrespective of Contractual Delivery), such amount will be recovered from any bill of the Seller, immediately on enforcement of such variation, under intimation to the Seller.

**12.0 REJECTION**

12.1 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.

12.2 Seller 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 Purchaser.


**13.0 LIMITATION OF LIABILITY**

13.1 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.

**14.0 GOVERNING LAW**

14.1 Laws of India will govern the Agreement and Pune Courts will have exclusive jurisdiction on all matters related to the Agreement.

**15.0 PURCHASER'S RIGHTS AND REMEDIES**


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

**16.0 GUARANTEE / WARRANTY / DEFECT LIABILITY PERIOD**

- 16.1 The Contractor warrants that the Goods supplied and services provided under the Agreement are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract Documents. The Contractor further warrants that all Goods supplied and services provided under this Agreement shall have no defect, arising from design, materials, or workmanship (except when the design and / or material is required by the Purchaser's specifications and the Contractor has given his disclaimer of warranty obligations with respect to such requirement) or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods in the conditions prevailing in the place of use / destination.
- 16.2 Defect liability period shall be 12 months from the date of handing over the system to MNGL i.e. installation and commissioning of package.
- 16.3 Contractor will assume responsibility in obtaining manufacturer's warranty for all bought out items and maintain sufficient stock of spares at each site to meet urgent requirements.
- 16.4 The Owner shall promptly notify the Contractor in writing of any claims arising under this warranty.
- 16.5 Upon receipt of such notice, the Contractor shall, within a reasonable period, repair or replace the defective Goods or parts thereof, free of cost to the Purchaser, deliver at the appropriate destination. The Contractor may take over the replaced parts / Goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts / goods thereafter. In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced Goods or item or material shall be extended to a further period of twelve (12) Months from the date of such repair/replacement if put to use immediately or eighteen (18) Months.
- 16.6 If the Contractor, having been notified, fails to remedy the defect(s) within a reasonable period, the Purchaser may proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Purchaser may have against the Contractor under the Agreement.


**17.0 QUALITY ASSURANCE / QUALITY CONTROL**

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- 17.1 The Seller shall prepare a detailed Quality Assurance Plan for the execution of the Contract for various facilities, which will be mutually discussed and agreed to.
- 17.2 The Seller shall establish document and maintain an effective quality assurance system outlined in recognized codes.
- 17.3 The Purchaser, while agreeing to a Quality Assurance Plan shall mark the stages where they would like to witness the tests, review any or all stages of work at shop as deemed necessary for quality assurance.

**18.0 General Information relating to Consignee address, Banker's Name, Insurance Agent etc. :**

- **Location & Address of project Consignee**  
Maharashtra Natural Gas Ltd.  
Pride Purple Coronet, 2nd Floor,  
Baner Road, Baner,  
Pune – 411045  
Tel. No. 020-25611190  
Mobile no. 9763252251
- **Name & Address of the Bankers :**  
Corporation Bank  
Jeevan Prakash Bldg.,  
LIC University Road,  
Shivajinagar, Pune – 411005
- **GST Number :** 27AAECM5536G1ZF
- **Name & Address of consignee for import at seaport/ airport of entry:**  
Mumbai
- **Whether Certificate for availing concessional project rate of custom duty will be given:** No
- **Name of Address of insurance agency:**  
To be intimated at the time of placement of PO.
- **Mode of Payment:** A/C Payee Cheque
- **Preferred mode of despatch:**  
Imports: Sea  
Domestic: By Road
- **Inspection agency for indigenous and imported items:** MNGL / Third party inspection agency appointed by MNGL

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**19. Miscellaneous**

19.1 In case of an irreconcilable conflict between Indian or other applicable standards, General Conditions of Contract, Special Conditions of Contract, Specification, Drawings or Schedule of Rates, the following shall prevail to the extent of such irreconcilable conflict in order of precedence :

- i) Letter of Award/ Purchase Order
- ii) Letter of Acceptance/ FOI alongwith Statement of Agreed Variations.
- iii) Schedule of Rates as enclosures to Letter of Award/ Purchase Order
- iv) Special Conditions of Contract
- v) Drawings
- vi) Technical/ Material Specifications / Scope of work
- vii) Instruction to Bidder
- viii) General Conditions of Contract (Goods) for supply part of the contract.
- ix) Applicable standards as specified.
- x) Applicable standards not specified.

19.2 It will be the Manufacturer's responsibility to bring to the notice of Purchaser any irreconcilable conflict in the contract documents before starting the work(s) or making the supply with reference to which the conflict exists.

19.3 In the absence of any Specifications covering any material, design of work(s) the same shall be performed/ supplies/ executed in accordance with Standard Engineering Practice as per the instructions/ directions of the Purchaser, which will be binding on the Manufacturer.

19.4 Subsequent Price Change on Account of Technical/ Commercial Clarification and/ or Validity Extension Once quoted, the bidder shall not make any subsequent price changes, whether resulting or arising out of any technical/ commercial clarifications sought regarding the bid even if any deviation or exclusion may be specially stated in the bid. Such price changes shall render the bid liable for rejection.

**20.0 ANNUAL MAINTENANCE (AMC) REQUIREMENT DURING MAINTENANCE PERIOD**

The contractor must follow the AMC REQUIREMENT as stated below but not limited to and ensure to provide trouble free services as defined in the bid documents.


**20.1 Accommodation/ Transportation/ Medical**

The contractor shall make his own arrangement for the accommodation of his personnel and transportation arrangement for visiting MNGL sites / office. Owner shall have no obligation in this respect.

**20.2 Discipline**

The contractor shall be responsible for the discipline and good behaviour of all his personnel deployed in the services contracted out.



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### 20.3 Identity Card

The contractor shall arrange to supply / renew identity card to his workforce at his own cost, if so required by OWNER 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.

### 20.4 The Engineer-in-Charge Shall Have Power To

- i) Issue the contractor from time to time during the running of the contract such further instructions as shall be necessary for the purpose of proper and adequate execution of the contract and the contractor shall carry out and bound by the same.
- ii) Order the contractor to remove or replace any workman whom the Owner considers incompetent or unsuitable and opinion of the Owner representative as to the competence of any workman engaged by the contractor shall be final and binding on the contractor.

### 20.5 Indemnity

Contractor shall exclusively be liable for non-compliance of the provision of any act, laws, rules and regulations having bearing over engagement of workers directly or indirectly for execution of work and the contractor hereby undertake to indemnify the Owner against all actions, suits, proceedings, claims, damages demands, losses, etc. which may arise under minimum wages act, payment of wages act, workman compensation act, personnel injury (compensation insurance) act ESI Act, Fatal Accident Act, Industrial Dispute Act, Shops and Establishment Act, Employees Provident Fund Act, Family Pension and deposit Linked Insurance Scheme or any other act or statutes not herein specifically mentioned but having direct or indirect application for the persons engaged under this contract. (A certificate to this effect shall be submitted by the contractor immediately on receipt of Purchase Order).


## 21.0 INSURANCE IN INDIA:

### 21.1 General

CONTRACTOR shall at his own expense arrange secure and maintain insurance with reputable insurance companies to the satisfaction of the OWNER as follows:

CONTRACTOR at his cost shall arrange, secure and maintain insurance as may be necessary and to its full value for all such amounts to protect the works in progress from time to time and the interest of OWNER against all risks as detailed herein. The form and the limit of such insurance, as defined herein together with the under writer works thereof in each case should be as acceptable to the OWNER. However, irrespective of work acceptance, the responsibility to maintain adequate insurance coverage at all times during the period of CONTRACT shall be that of CONTRACTOR alone. CONTRACTOR's failure in this regard shall not relieve him of any of his responsibilities and obligations under CONTRACT.



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Any loss or damage to the equipment, during ocean transportation, port/custom clearance, inland and port handling, inland transportation, storage, erection, testing and commissioning till such time the work is taken over by OWNER, shall be to the account of CONTRACTOR. CONTRACTOR shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and/or replacement of the parts of the work damaged or lost. CONTRACTOR shall provide the OWNER with a copy of all insurance policies and documents taken out by him in pursuance of the CONTRACT. Such copies of documents shall be submitted to the OWNER immediately upon the CONTRACTOR having taken such insurance coverage. CONTRACTOR shall also inform the OWNER at least 60 (Sixty) days in advance regarding the expiry cancellation and/or changes in any of such documents and ensure revalidation/renewal etc., as may be necessary well in time.


Statutory clearance, if any, in respect of foreign supply required for the purpose of replacement of equipment lost in transit and/or during Testing & Commissioning, shall be made available by the OWNER. CONTRACTOR shall, however be responsible for obtaining requisite licenses, port clearances and other formalities relating to such import. The risks that are to be covered under the insurance shall include, but not be limited to the loss or damage in handling, transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire, war risk (during ocean transportation only) etc. The scope of such insurance shall cover the entire value of supplies of equipments, plants and materials to be imported from time to time.

All costs on account of insurance liabilities covered under CONTRACT will be to CONTRACTOR's account and will be included in VALUE OF CONTRACT. However, the OWNER may from time, during the currency of the CONTRACT, ask the CONTRACTOR in writing to limit the insurance coverage risk and in such a case, the parties to the CONTRACT will agree for a mutual settlement, for reduction in VALUE OF CONTRACT to the extent of reduced premium amounts.

CONTRACTOR as far as possible shall cover insurance with Indian Insurance Companies, including marine Insurance during ocean transportation.

**i) EMPLOYEES STATE INSURANCE ACT:**

The CONTRACTOR or their local agents agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employee State Insurance Act, 1948 including notified modification and the CONTRACTOR further agrees to defend, indemnify and hold OWNER harmless for any liability or penalty which may be imposed by the Central, State or local authority by reason of any asserted violation by CONTRACTOR or SUB-CONTRACTOR of the Employees' State Insurance Act, 1948 and also from all claims, suits on proceeding that may be brought against the OWNER arising under, growing out of or by reasons of the work provided for by this CONTRACTOR


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whether or by Central or State Government authority or any political sub-division thereof.

The CONTRACTOR agrees to fill in with the Employees' State Insurance Corporation, the Declaration Forms, and all forms which may be required in respect of the CONTRACTOR's or SUB-CONTRACTOR's employees, who are employed in the WORK provided for or those covered by ESI from time to time under the Agreement. The CONTRACTOR shall deduct and secure the agreement of the SUB-CONTRACTOR to deduct the employee's contribution as per the first schedule of the Employee's State Insurance Act from wages and affix the Employees Contribution Card at wages payment intervals. The CONTRACTOR shall remit and secure the agreement of the SUB-CONTRACTOR to remit to the State Bank of India, Employee's State Insurance Corporation, Account, the Employee's Contribution as required by the Act. The CONTRACTOR agrees to maintain all cards and records as required under the Act in respect of employees and payments and the CONTRACTOR shall secure the agreement of the SUB-CONTRACTOR to maintain such records. Any expenses incurred for the contributions, making contributions or maintaining records shall be to the CONTRACTOR's or SUB-CONTRACTOR's account.

The OWNER shall retain such sum as may be necessary from the total VALUE OF CONTRACT until the CONTRACTOR shall furnish satisfactory proof that all contributions as required by the Employees State Insurance Act, 1948, have been paid. This will be pending on the CONTRACTOR when the ESI Act is extended to the place of work.

- ii) **WORKMEN COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE:**  
Insurance shall be affected for all the CONTRACTOR's employees engaged in the performance of this CONTRACT. If any part of WORK is sublet, the CONTRACTOR shall require the SUB-CONTRACTOR to provide Workman's Compensation and employer's liability insurance for the later's employees if such employees are not covered under the CONTRACTOR's Insurance.
- iii) **ANY OTHER INSURANCE REQUIRED UNDER LAW OR REGULATIONS OR BY OWNER:**  
CONTRACTOR shall also carry and maintain any and all other insurance(s) which he may be required under any law or regulation from time to time without any extra cost to OWNER. He shall also carry and maintain any other insurance which may be required by the OWNER.
- iv) **ACCIDENT OR INJURY TO WORKMAN:**  
The OWNER shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the Employment of the CONTRACTOR or any SUB-CONTRACTOR save and except an accident or injury resulting from any act or default of the OWNER, his agents or servants and the CONTRACTOR shall

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indemnify and keep indemnified the OWNER against all such damages and compensation (save and except and aforesaid) and against all claims, demands, proceeding, costs, charges and expenses, whatsoever in respect or in relation thereto.

**vi) TRANSIT INSURANCE:**

In respect of all items to be transported by the CONTRACTOR to the SITE OF WORK, the cost of transit insurance should be borne by the CONTRACTOR and the quoted price shall be inclusive of this cost.

**vii) CONTRACTOR'S ALL RISK INSURANCE POLICY (CAR)**

The contractor shall take all risk insurance policies at its own cost.

**21.2 Damage to property or to any person or any third party :**

21.2.1 CONTRACTOR shall be responsible for making good to the satisfaction of the OWNER any loss or any damage to structures and properties belonging to the OWNER or being executed or procured or being procured by the OWNER or of other agencies within the premises of all the WORK of the OWNER, if such loss or damage is due to fault and/or the negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representatives or SUB-CONTRACTORS.


21.2.2 The CONTRACTOR shall take sufficient care in moving his plants, equipments and materials from one place to another so that they do not cause any damage to any person or to the property of the OWNER or any third party including overhead and underground cables and in the event of any damage resulting to the property of the OWNER or of a third party during the movement of the aforesaid plant, equipment or materials the cost of such damages including eventual loss of production, operation or services in any plant or establishment as estimated by the OWNER or ascertained or demanded by the third party shall be borne by the CONTRACTOR. Third party liability risk shall be Rupees One lakh for single accident and limited to Rupees Ten lakhs.

21.2.3 The CONTRACTOR shall indemnify and keep the OWNER harmless of all claims for damage to property other than OWNER's property arising under or by reason of this agreement, if such claims result from the fault and/or negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representative of SUBCONTRACTOR.

**22.0 ADDITION TO GCC:**

**i) Also:-**

In case of range of variation up to inclusive of range of +50% & -25% no increase and/or decrease shall be applicable in Schedule of Rates.

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**ii) Abnormally High Rated Item (AHR)**

In items rate contract where the quoted rates for the item, exceed 50% of the owners estimated rates, such items will be considered as Abnormally High Rates Items (AHR) and payment of AHR items beyond the BOQ stipulated quantities shall be made at the least of the following rates :-

1. Rates as per BOQ, quoted by the Contractor.
2. Rate of the item, which shall be delivered as follows :
  - a) Based on rate of machine and labour as available from the contract (which is including 15% cover towards contractor's profit overhead and other expenses).
  - b) Based on prevailing market rate of machine materials and labour plus 15% to cover contractors profit, overhead and other expenses, when the rates are not available in the contracts.

iii) Notwithstanding the provisions contained in Clause (ii) above, MNGL would have the right to negotiate all such AHR items before the award of the work.




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## **SECTION - VI**

### **SCOPE OF WORK / TECHNICAL SPECIFICATIONS**

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### **INTRODUCTION:**

Maharashtra Natural Gas Limited is a Joint Venture of GAIL & BPCL, operating City Gas Distribution Network in Pune and Pimpri-Chinchwad Cities. The Automation Project is a very important tool for MNGL to maintain control over its exponential growth Of PNG & CNG stations across the periphery of Pune and newer GAS' and upgrade existing products and maintain competitive position in the market with the existing Infrastructure, human resource etc.

The CGD network in Pune city is basically divided into the following functional areas, through which piped gas is distributed effectively to customers.

1. Mother Station: Main Gas receiving terminal for the city/area, wherein gas is received at 19 bar pressure, through steel pipeline from GAIL.
2. Online CNG stations: Online stations are CNG stations which receive piped Natural Gas through steel lines at 19 bar pressure and convert the same to 200 bar pressure through online compressors.
3. Daughter Booster Stations: Daughter Booster stations are CNG stations where there is no piped gas connectivity, but CNG is being delivered to the customers through dedicated LCV network and booster compressors.
4. District Pressure Regulating Stations: DRS/DPRS are pressure regulating skids which receive natural gas through steel lines at 19 bar pressure and convert de pressurize the same to 4 bars for domestic/commercial/industrial use.
5. Meter Regulating Stations: MRS are pressure regulating skids installed at industrial customer premises, which receive natural gas through MDPE lines and de-pressurize or regulate the pressure as per individual customer requirement.

### **Cathodic Protection (CP):**

CP systems protect steel buried pipelines from corrosion through, Transformer & Rectifier Unit (TR Unit).TR Unit is a system to protect steel pipeline from Corrosion by providing continuous current for wider area.

### **Test Lead Point (TLP):**

Test lead point are installed to monitor Pipe to Soil potential (PSP) in smaller segments of steel line.


### **Odorizer Unit:**

This system is use to odour the Natural Gas.

MNGL is presently planning to integrate Tap-Off points, MRS, CNG stations, TR units, TLP for monitoring and control through Web-Application.

### **On-line Gas Chromatograph:**

On-line Gas chromatograph has been installed for analysis of Gas composition.

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**DRS:**

Monitor Inlet & Outlet Pressure, Slam Shut valve position & control for effective control of Network pressure.

**Fire & Gas Detection (F&G) system:**

Fire & Gas detection system shall be installed in DRS/MRS for monitoring & control of Metering Skid.

**A. Project Background**

MNGL operation & network for PNG and CNG is widespread across Pune and Pimpri-Chinchwad cities. Monitoring & Data logging is done manually, and Systems are controlled at individual locations. This calls for huge manpower and manual intervention, also various systems like CNG station, MRS, DRS, CGS, TR Unit and Odorizer Unit is functioning in stand-alone mode.

To ensure effective Monitor and Control, with Safe and Efficient operation of network spread across Pune city – web-Application based control system is envisaged. (The complete project shall herein after referred to as MNGL Automation project in this specification, the COMPANY shall herein refer to as Maharashtra Natural Gas Limited-MNGL)

In the event of any conflict between this specification, related standards and codes, any other attachment to this tender, the Automation Vendor shall refer the matter to COMPANY for clarification and only after obtaining the same should proceed with the manufacture/ supply/ engineering of the item in question. The decision of the COMPANY shall be binding on the Automation vendor.

**B. Project Objectives**


This specification outlines the requirements of Automation Project (Web-App) system, for company's complete Natural Gas Distribution Network consisting of CNG stations, City Gate Station (CGS), PNG customers. (This complete project shall herein after being referred to as MNGL Automation project in this specification).

Presently there are 2 nos. of City Gate Station, 300+ nos. of Industrial customers, 250+CNG outlets and many additional CGS/Customers/Outlets are planned every year.

**OPERATION PHILOSOPHY for CNG Station Automation:**


1. The Automation Project will include gathering of all data/operating parameters from all the field equipment viz. CNG Compressor, CNG Dispenser, LCV Filling point mass flowmeter etc. through local RTU/IoT and **push** the same into the **dedicated** server periodically without human intervention through GPRS/Ethernet based communication protocol.
2. A web-based application to be designed for human interface/GUI, which will display all the collected data in the server on any internet enabled device, through proper login credentials with Fire walls.



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3. The server will be cloud based. No physical server to be installed separately in MNGL premises.
4. The Web-Application will be able to display data, station wise as well as email the same to pre-defined email addresses at a pre-defined time (0600 HRS), on daily basis.
5. The vendor must design an FTP server to collect data from the Web-Application in a pre-defined format so as to interface with SAP to process the billing for individual CNG station.
6. The web-application will have provision for remotely shutting down CNG compressor of any given station in case of EMERGENCY.
7. In addition to the regular data collection and display interface the Web-Application should be able to do predictive analysis of Gas Consumption/usage by any given customer and MNGL as a whole by comparing daily Gas consumption patterns. This will help MNGL during Gas-Sourcing. The algorithm used by the Web-Application should be handed over to MNGL after commissioning, by the bidder, without any further cost implications to MNGL.
8. The bills for each CNG station to be generated on fortnightly/monthly basis and must be mailed to the respective customers as well as MNGL. This will be in the scope of SAP vendor, but the data must be transmitted to the FTP server by the Web-Application.
9. The data that will be pushed by the RTU to Web-Application must have an intermediate stage where-in the operator at the control room can validate the data before the data is pushed to FTP server, for billing. Without operator validation the Web-Application will not push the data into the FTP server.  
Uploading of Data to FTP server will be in the scope of the bidder. Total manpower deployment must be decided by the bidder to attain the %availability of entire system as mentioned in the tender document.
10. Each RTU should have in-built memory for storing data of at least 1 GB, so as to facilitate data storage in case of communication failure between RTU and the cloud server. The RTU must push the entire data stored, after recovery of communications. The RTU should store data of at least past 72 Hours and continuously over-write after every cycle, after pushing the data into cloud server.
11. The RTU will push data into the Web-Application at an interval of 5 minutes, which will enable the operator to monitor live status of the equipment.
12. The entire system should employ proper security measures/encryption and decryption to avoid data theft.
13. All data should be communicated through CAT6 cables from equipment to RTU and then from RTU to cloud server through Ethernet or GPRS as per availability at the site, preferably Ethernet.
14. All the data will be made available in a Master Control Room, where MNGL personnel/operator will be monitoring the data 24X7 basis. There will be provision for singular viewing on authorized log in ID and credentials, at any location in any internet enabled device apart from MCC. The structure of MCC will be defined in the subsequent pages.




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15. Both Read and Write access will be required for all equipment for specific parameters
16. After project completion a minimum of 5 years AMC service has to be provided by the vendor, which will include all aspects of the project. During this period the bidder has to implement all necessary changes pertaining to Operational requirement as suggested by MNGL.  
Changes in User Interface, Software patches/upgradation, aesthetics of application, addition/deletion etc. will be done by the bidder during the AMC period on request from MNGL. Other aspects such as hardware replacement/repairing will come under comprehensive AMC.
17. The design of the Web-Application will be in consultation with MNGL. No pre-defined application will be entertained. The application will be MNGL specific and MNGL centric, hence the bidder has to build the application from scratch. Source code of the application to be handed over to MNGL with exclusive rights to avoid further copy-right infringement.
18. All critical parameters/alarms to be sent to registered cell phone numbers through SMS alerts, notifying the user/management for corrective measures.
19. Mandatory Spares (SMPS, Antenna, GSM modem, Relays and converters, Barriers.) to be provided by vendor after commissioning of the entire system.
20. Firewall to be provided and synchronized for accurate data collection.
21. All work to be done as per PNGRB guidelines.

## 1 SRS

Technology has continued to drive forward industrial manufacturing at a breakneck pace, and IoT deployments are starting to lead the charge in efficient production, operations and logistic flows. IoT offers a revolutionary new way to look at the business process, doing automation and generating cost savings in places previously thought impossible.

Internet of Things (IoT) represents a vision in which the Internet extends into the real world embracing everyday objects. Physical items are no longer disconnected from the virtual world but can be controlled remotely and can act as physical access points to Internet services.


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*At **MNGL**, we aim to bring together advances in digital technologies by combining the technologies together and creating a cohesive technological environment with **Industrial IoT, Big Data and Analytics, Cloud and Edge Computing**.*

With that basic understanding of IoT in place, here's a quick rundown of the application you need to build. The application should mine data that is incredibly unstructured and complex compared to even the most intricate enterprise data sources. It has to correlate and match data from different data sources. It has to analyse historical patterns and track time series data in real time. This document explains the elements to build a robust, maintainable, end-to-end IoT solution on Cloud Platform.

### **1.1 Project Background**

MNGL operation & network for PNG and CNG is widespread across Pune and Pimpri- Chinchwad cities. Monitoring & Data logging is done manually, and Systems are control at individual locations. This calls for huge manpower and manual intervention, also various systems like CNG station, MRS, DRS, CGS, TR Unit and Odorizer Unit are functioning in stand-alone mode. To ensure effective Monitor and Control, with Safe and Efficient operation of network spread across Pune city – Web-Application based control system is envisaged. (The complete project shall hereinafter refer to as MNGL Automation project in this specification, the COMPANY shall herein referred to as Maharashtra Natural Gas Limited (MNGL). In the event of any conflict between this specification, related standards and codes, any other attachment to this tender, the Automation Vendor shall refer the matter to COMPANY for clarification and only after obtaining the same should proceed with the manufacture/ supply/ engineering of the item in question. The decision of the COMPANY shall be binding on the Automation vendor.

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## **1.2 Project Objective**

This specification outlines the requirements of Automation Project (Web-App) system, for company's complete Natural Gas Distribution Network consisting of CNG stations, City Gate Station (CGS), PNG customers. (This complete project shall hereafter be referred to as MNGL Automation project in this specification).

## **1.3 Challenges**


Compressed Natural Gas and PNG has seen massive development due to a major government drive for clean energy. However, gas services involve a range of interests on many sides, including safety, customer satisfaction, enterprise profitability, and balancing energy demand and supply. CGD business is also beset with multiple management problems.

CNG and PNG are supplied via Steel and MDPE pipeline networks. To supply and sell, gas meters are provided to measure amounts and calculate charges. The accuracy and frequency of reading gas meters and the rate of timely payments directly impacts business profits and the collection efficiency of receivables.

Traditionally, meter reading and invoicing are time consuming and error prone activities which affect business a lot.

There are many challenges to building IoT applications, such as a lack of network connectivity due to the remote location of industrial plants. Using a proper Edge Gateway design is essential to the remote location of industrial plants. Getting access to data from equipment sensors is a challenge, due to the disparate equipment types from different manufacturers. Industrial equipment produces huge volumes of data in a short amount of time. This data needs to be processed, and insights gathered from it in real-time.

To provide data security at all levels, from edge to cloud, is a challenge, therefore careful design decisions should be made regarding security. Developing analytics targeted for a specific asset is another challenge and it requires deep domain knowledge as well as knowledge of the equipment.

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New, general-purpose predictive algorithms such as anomaly detection using Deep Neural Networks and K-Cluster analysis are available.

## 2 Technology & Platform

Server	:	Cloud (Amazon Web Services)
Server Operating System	:	Windows/Linux Latest
Server Instances	:	Elastic Compute Cloud - EC2 (t2.xlarge) or better
Database Instance	:	Amazon RDS for MySQL
Storage Instance	:	Simple Storage Service - S3
Server-Side Programming	:	Python
Client-Side Programming	:	HTML5/CSS3/JavaScript with ReactJs
IIOT Analytic	:	CoAP/MQTT Server/Client Architecture
Web Server	:	Nginx
GIS Server	:	ArcGIS 10.6
API	:	REST API (JSON)

In this project, the Agency will implement the Automation System using Cloud Infrastructure. As per the throughput calculation, AWS EC2, t2.xlarge instances has been taken into the consideration however further infrastructure may scale up to required specification as per the future requirement. The detailed cloud server specifications have been provided as under:

1. 4 vCPU, 16GB RAM, 3.0 GHz/300GB Application Server- Intel Scalable Processor, High frequency Intel Xeon processors or better.
2. 4vCPU/32 GB RAM /1 TB Pay as you use basis DB Server
3. Managed Services -OS, DB Management, Daily, Weekly, Monthly, bi-monthly, Half yearly, Yearly backups, Shared Managed Firewall
4. 2 mbps uncapped bandwidth
5. Public IP Address x 2 (1 Required other one optional)
6. Backup Agent Per instance
7. Storage management Per job

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8. Backup management Per instance
9. Firewall management Per instance
10. Advance Monitoring Per instance
11. Port termination Per Port
12. Data Replication management Per Job Comes under Maintenance Architecture
13. Backup space Per TB Pay as you use basis

In addition to the above technology platform, IIoT and required hardware shall be supplied and installed at the designated CNG Pump stations as per the tender specification.

IIoTs / RTUs are powerful, secure, and inexpensive long-range wireless communication technology that can solve issues with smart metering and guarantee wide coverage, low power use, and a high number of connections.

## 2.1 Components

*IIoT system architecture consists of three major networked components.*


### 1. Devices

### 2. Gateway

### 3. Cloud

1. Devices, typically sensors and actuators, from the IIoT equipment which use Modbus to connect to an Edge Gateway.

2. Sensor data aggregation systems called Edge Gateways that provide functionality, such as pre-processing of the data, securing connectivity to the Cloud, and using systems such as WebSocket, edge analytics or fog computing. The data generated by sensors creates large volumes of data rapidly and, by pre-processing the data, the gateway can only send relevant data to the Cloud.

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3. Cloud includes Application built for Industrial IoT (IIoT) using the micro services architecture, which inherently secure in nature using HTTPS/OAuth. This also includes storage of sensor data using various database systems, such as time series databases or asset stores using backend data storage systems such as Cassandra or MySQL. In addition to data storage, we analyse the data using various analytics, predictive, or threshold-based, or regression-based, to get more insights on the IoT equipment. As an example, we can use historical data from sensors, and the outcomes from analytics, to provide recommendations. In this case, we would store the historical data, both the input and output action, in a cloud datastore and then use this data as a training model for supervised and unsupervised machine learning algorithms to provide recommendations for case management systems.

### **Types of information**


Each device can provide or consume various types of information. Each form of information might best be handled by a different backend system, and each system should be specialized around the data rate, volume, and preferred API. This section lists and describes common categories of information found in IoT scenarios.

### **Device metadata**

Metadata contains information about a device. Most metadata is immutable or rarely changes.

Examples of metadata fields include:

- Identifier (ID) - An identifier that uniquely identifies a device. The device ID should never change for the lifespan of a deployed device.
- Class or type (EVC, Compressor, Dispenser etc...)
- Model (e.g. Plum Macbat IV or V)
- Revision
- Date manufactured

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- Hardware serial number

### State information

State information describes the status of the device, not of the environment. This information can be read/write. It is updated, to understand the real-time status of the device.

### Telemetry

Data collected by the device is called *telemetry*. This is the eyes-and-ears data that IoT devices provide to applications. Telemetry is read-only data about the environment, usually collected through sensors.

Each source of telemetry results in a *channel*. Telemetry data might be preserved as a stateful variable on the device or in the cloud.


Although each device might send only a single data point in real-time, when you multiply that data by many devices, you quickly need to apply big data strategies and patterns.

### Commands

*Commands* are actions performed by a device. Commands often have traits that constrain the choices available in your implementation. These traits include:

- Commands are not easily represented as state data.
- Commands are often not idempotent, which means each duplicate message usually results in a different outcome. Like messaging systems, the implementation of a command function determines the delivery semantics, such as "at least once" or "exactly once". The command mechanism can include a return value or might rely on the confirmation being made through a separate return message or by reflecting the expected change in the state data.
- Commands might be of limited temporal relevance, so they should include a time-to-live (TTL) or other expiration value.

Examples of commands, in our case, include:

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- Remote Shut off Valve through SOV
- Increase Pressure through PLC

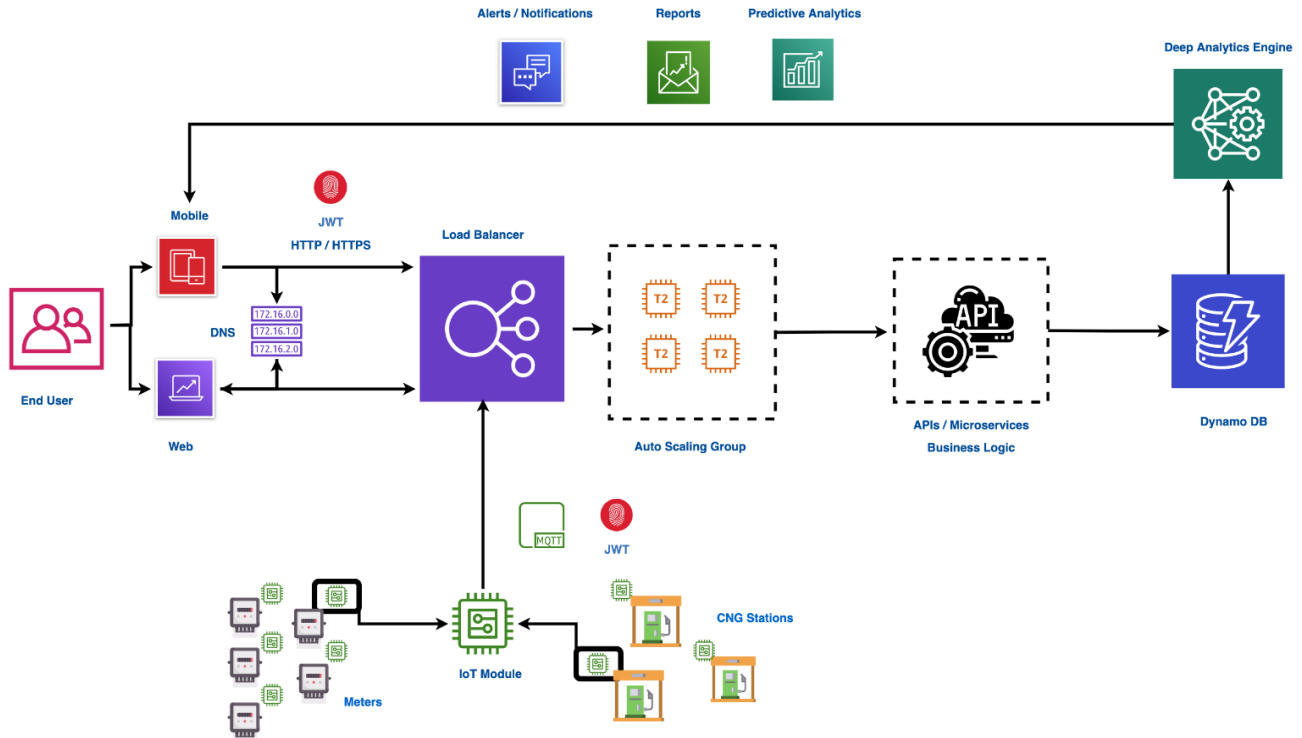
### **Operational Information**

Operational information is data that is most relevant to the operation of the device as opposed to the business application. This might include things such as device operating temperature, battery state, firmware/software version etc. This kind of data might not have long-term analytical value, but it has short-term value to help maintain the operating state, such as responding to breakages and correcting performance degradation of software/firmware after version updates.

Operational information can be transmitted as telemetry or state data.




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## Analytics for IIoT

Analytics is at the heart of a robust IIoT application, and understanding different types of analytics and utilizing the appropriate technology is essential for the success of developing an IIoT application. There are different types of analytics that can be developed for IoT applications, all the way from a simple threshold analytic to streaming analytics using Kafka, Spark, and NoSQL stores like DynamoDB, as given as follows.

- **Descriptive Analytics** - insight into device health
- **Predictive Analytics** - understanding the future failure modes of the device
- **Prescriptive Analytics** - advice on possible outcomes

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### Device Management

Core Device Manager application should provide a fully managed service for managing devices. This includes registration, authentication, and authorization inside the Cloud Platform resource hierarchy as well as device metadata stored in the cloud, and the ability to send device configuration from the service to devices.

### Ingestion

Ingestion is the process of importing information from devices into Cloud Platform services. Cloud Platform should provide different ingestion services, depending on whether the data is telemetry or operational information about the devices and the IoT infrastructure.


### Core MQTT

The application should provide a secure MQTT (Message Queue Telemetry Transport) broker for devices managed by Core Device Manager. This efficient binary industry standard allows for constrained devices to send real-time telemetry as well as immediately receive messages sent from cloud to device by using the configuration management feature.

### Pipeline processing tasks

Pipelines manage data after it arrives on Cloud Platform, similar to how parts are managed on a factory line. This includes tasks such as:

- **Transforming data.** You can convert the data into another format, for example, converting a captured device signal voltage to a calibrated unit measure of temperature.
- **Aggregating data and computing.** By combining data you can add checks, such as averaging data across multiple devices to avoid acting on a single, spurious, device. You can ensure that you have actionable data if a single device goes offline. By adding computation to your pipeline, you can apply streaming analytics to data while it is still in the processing pipeline.

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- **Enriching data.** You can combine the device-generated data with other metadata about the device, or with other datasets, such as weather or traffic data, for use in subsequent analysis.
- **Moving data.** You can store the processed data in one or more final storage locations.

### **Data Storage**

When you need to make state or telemetry data available to mobile or web apps, you can store processed or raw data in structured but schema less databases, such as NoSQL, where you can represent IoT device data as domain or application-level objects.

### **Data Analytics**

Performing analytics on data obtained through IoT sources is often the entire purpose of instrumenting the physical world. After streaming data has been analysed in a processing pipeline, it will begin to accumulate. Over time, this data provides a rich source of information for looking at trends, and can be combined with other data, including data from sources outside of your IoT devices.

### **Machine Learning**

IoT data is often inherently multi-dimensional and noisy by nature. These attributes can make it hard to extract insight by using conventional analytics techniques. However, this nuance and complexity is often where Deep Neural Networks excel. Below mentioned are the steps that need to be followed for every ML Solution that needs to be used for predictive analysis.

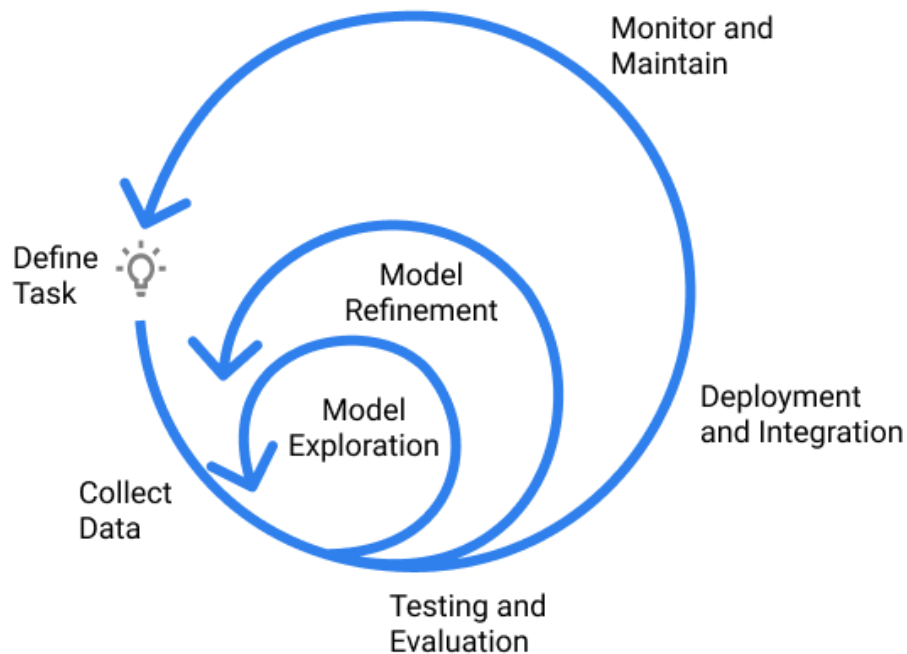


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## Machine Learning Development Lifecycle



**Model Building:** A combination of an understanding of the problems, unified with proposed solutions, and available data, will enable a suitable ML model selection process to achieve the ideal solution result. The problems that can be tackled using the collected data should be formulated by discussing with MNGL and then suitable models should be developed using **Keras, PyTorch or Tensorflow**.

*Neural Network or the developed model Architecture should be submitted to MNGL using which the data is to be trained.*

- [Keras](#) is a high-level API capable of running on top of TensorFlow, CNTK, Theano, or MXNet (or as tf.contrib within TensorFlow). Since its initial release in March 2015, it has gained favour for its ease of use and syntactic simplicity, facilitating fast development. It's supported by Google.

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- [PyTorch](#), released in October 2016, is a lower-level API focused on direct work with array expressions. It has gained immense interest in the last year, becoming a preferred solution for academic research, and applications of deep learning requiring optimizing custom expressions. It's supported by Facebook.
- [TensorFlow](#), is an open-source machine learning framework for all developers. It is used for implementing machine learning and deep learning applications. To develop and research on fascinating ideas on artificial intelligence, Google team created TensorFlow. TensorFlow is designed in Python programming language, hence it is considered an easy-to-understand framework.

**Training, Validation and Test Datasets:** Data is the fuel for an ML/CV application. Data aggregation is a crucial step that sets a precedent for the effectiveness and performance of the trained model. The output of the agreed-upon solution defines the data aggregated. Data understanding is paramount, and any sourced data should be examined and analysed utilizing visualization tools or statistical methods. Data examination promotes data integrity and credibility by ensuring the data sourced is the expected data.

*The annotated data source representing the input parameters and the output parameters to be shared with MNGL along with the split of Training, Validation and Test datasets.*

**Data Pre-processing:** The pre-processing step transforms the raw sourced data into a format that enables successful model training. Data pre-processing could include the identified steps below, but not limited to the mentioned steps:

- Data Reformatting
- Data Cleaning

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- Data Normalization

**Data augmentation:** The step that is carried out to improve the diversification of data that has been sourced.


*The applied pre-processing and augmentation steps need to be shared with MNGL after which the input data to the model is ready.*

**Training:** Typically, model implementation is simplified by leveraging existing models. Most ML/DL frameworks such as Keras, PyTorch or TensorFlow, have pre-trained models that are leveraged to speed up the model implementation stage. These pre-trained models have been trained on robust datasets and mimic the state-of-the-art neural network architectures' performance and structure. The following might be expected to be conducted during the model implementation stage if you are using any pre-trained model:

- Removal of last layers within a neural network to re purpose models for specific tasks.
- Fine-tuning pre-trained models

The training data delivered from the previous Data stages are utilized within the training stage. The implementation of model training involves passing the refined aggregated training data through the implemented model to create a model that can perform its dedicated task well.

The training of the implemented model involves iteratively passing mini batches of the training data through the model for a specified amount of epochs. During the early stages of training, model performance and accuracy can be very unimpressive. Still, as the model conducts predictions and a comparison of predicted values is made to the desired/target value, backpropagation takes place within the neural networks, the model begins to improve and gets better at the task it is designed and implemented to do.

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Just before training can commence, we must set hyperparameters and network parameters that will steer the effectiveness of our training stage on the model. Just before training can commence, we must set hyperparameters and network parameters that will steer the effectiveness of our training stage on the model.


- **Hyperparameters:** These are values that are defined before the training of the network begins; they are initialized to help steer the network to a positive training outcome. Their effect is on the machine / deep learning algorithm, but they are not affected by the algorithm. Their values do not change during training. Examples of hyperparameters are regularization values, learning rates, number of layers, etc.
- **Network parameters:** These are components of our network that are not manually initialized. They are embedded network values that are manipulated by the network directly. An example of a network parameter is the weights internal to the network.

*The finalised optimal hyper-parameters used for training the model should be shared with MNGL with appropriate reasoning.*

**Metrics:** When conducting training, it is vital to ensure that metrics are recorded of each training process and at each epoch. The metrics that are generally collected are the following:

- Training accuracy
- Validation accuracy
- Training Loss
- Validation Loss

To collate and visualize training metrics, tools such as visualization tools **Matplotlib** and **Tensorboard** can be utilized. By visualizing the training metrics, it is possible to identify some common ML model training pitfalls, such as underfitting and overfitting.

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- **Underfitting:** This occurs when a machine learning algorithm fails to learn the patterns in a dataset. Underfitting can be fixed by using a better algorithm or model that is more suited for the task. Underfitting can also be adjusted fixed by recognizing more features within the data and presenting it to the algorithm.
- **Overfitting:** This problem involves the algorithm predicting new instances of patterns presented to it, based too closely on instances of patterns it observed during training. This can cause the machine-learning algorithm not to generalize accurately to unseen data. Overfitting can occur if the training data does not accurately represent the distribution of test data. Overfitting can be fixed by reducing the number of features in the training data and reducing the complexity of the network through various techniques.

*The metrics values obtained by training the finalized model should be shared and discussed with MNGL.*

**Evaluation:** At this stage, you should have a trained model and are ready to conduct evaluation techniques on its performance. For evaluation, we utilize a partition of the refined data, usually referred to as the 'test data'. The test data have not been seen during the model during training. They are also representative of examples of data that are expected to be encountered in practical scenarios. Some examples of evaluation strategies that can be leveraged are as follows:

- **Confusion matrix (error matrix):** Provides a visual illustration of the number of matches or mismatches the annotation of the ground truth to the classifier results. A confusion matrix is typically structured in tabular form, where the rows are filled with the observational results from the ground-truth, and the columns are filled with inference results from the classifier.





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- **Precision-Recall:** These are performance metrics that are used to evaluate classification algorithms, visual search systems, and more. Using the example of evaluating a visual search system (find similar images based on a query image), precision captures the number of results returned that are relevant, while recall captures the number of relevant results in your dataset that are returned.

**Parameter tuning and Inference:** Parameter tuning is the process of model refinement that is conducted by making modifications to hyperparameter values. The purpose of parameter tuning is to increase the model performance, and this correlates to improvements in evaluation results. Once hyperparameters are tuned and new values are selected, training and evaluation commence again. The process of parameter tuning is carried out until a suitable enough model is generated. Inference is a real-world test of our model. It involves utilizing real-world data that have been sourced from applicable environments.

**Model Conversion to appropriate mobile format:** At this stage, we should be confident in our model performance. Once we have our refined model, we are ready to place it on devices where it can be utilized. Model conversion is a step that is required when developing models that are to be used within edge devices such as mobile phones or IoT devices. Model conversion involves ML models trained in a GPU/CPU environment and converting them into an optimized and efficient version. The streamlined model is small enough to be stored on devices and sufficiently accurate to conduct suitable inference.

Examples of tools that enable model conversion to the mobile-optimized model are:

- **Core ML:** This is a framework released by Apple to create iOS only dedicated models. CoreML provides some models for common machine learning tasks such as recognition and detection. It's an iOS-only alternative to TensorFlow Lite.

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- **PyTorch Mobile:** PyTorch is a popular machine learning framework and is used extensively in machine learning-related research. PyTorch mobile can be compared to TensorFlow Lite, as it enables the conversion of PyTorch trained model to a mobile-optimized version that can be leveraged on iOS and Android devices. Although, PyTorch Mobile is still in its infancy and currently in experimental release status.
- **TensorFlow Lite:** takes existing TensorFlow models and converts them into an optimized and efficient version in the form of a .tflite file. The streamlined model is small enough to be stored on devices and sufficiently accurate to conduct suitable inference.

*The models should be converted into optimized and efficient versions for usage in different applications, to be shared with MNGL.*


**Model deployment:** Deploying our final trained model is the last step within all the identified stages. Integrating our model within a broader ecosystem of application or tool, or simply building an interactive web interface around our model, is an essential step of model deployment. There is also a monitoring responsibility that should be undertaken to assess the performance of the model while in a production environment. This is to ensure that the model is performing sufficiently well, and it still fit for purpose. Model retraining and updating is also a process within the model deployment stage. Model updating ensures the credibility and reliability of our model for the desired task.

*The CI/CD (Continuous integration/ Continuous Deployment) pipelines that enable model re-deployment should be given to MNGL.*

### **End to End Security**

Security is a critical concern when deploying and managing IoT devices. Cloud IoT Core offers the following security features:

- Per-device public/private key authentication using JSON Web Tokens (JWTs, [RFC 7519](#)).

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- This limits the surface area of an attack, because a compromised key would affect only a single device and not the whole fleet.
- JWTs are valid for a limited duration, so any compromised keys will expire.
- Support for RSA or Elliptic Curve algorithms to verify signatures, with enforcement for strong key sizes.
- Support to rotate keys per device by allowing concurrent keys to be registered, and support for expiration time per credential.
- [TLS 1.2](#) connection, using root certificate authorities (required for MQTT).
- XCloud Core API access is controlled by Cloud Identity and Access Management (IAM) roles and permissions.


Cloud Platform should bring device management, scale of infrastructure, networking, and a range of storage and analytics products we can use to make the most of device-generated data.

### **Geographic Information System (GIS)**

A **geographic information system (GIS)** is a conceptualized framework that provides the ability to capture and analyse spatial and geographic data.

GIS data represents real objects (such as roads, land use, elevation, pipeline, waterways, CNG stations, Industrial Zones, Green Zones etc.) with digital data determining the mix. Real objects can be divided into two abstractions: discrete objects and continuous fields. Traditionally, there are two broad methods used to store data in a GIS for both kinds of abstractions mapping references: raster images and vector. Points, lines, and polygons are the stuff of mapped location attribute references. GIS thematic maps then are becoming more and more realistically visually descriptive of what they set out to show or determine.

**ArcGIS** is a geographic information system for working with maps and geographic information maintained by the Environmental Systems Research Institute (Esri). It is used for creating and using maps, compiling geographic data, analysing mapped information, sharing and discovering geographic information, using maps and geographic information in a range of applications, and

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managing geographic information in a database. The system provides an infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the Web.

ArcGIS is built around a geodatabase, which uses an **object-relational database** approach for storing spatial data. A geodatabase is a "container" for holding datasets, tying together the spatial features with attributes. The geodatabase can also contain topology information, and can model behaviour

of features, such as road intersections, with rules on how features relate to one another. When working with geodatabases, it is important to understand feature classes which are a set of features, represented with points, lines, or polygons. With shapefiles, each file can only handle one type of feature. A geodatabase can store multiple feature classes or type of features within one file.


Geodatabases in ArcGIS can be stored in three different ways – as a **"file geodatabase"**, a **"personal geodatabase"**, or an **"enterprise geodatabase"** (formerly known as an SDE or ArcSDE geodatabase).

**Objective:** *Make maps that communicate, perform analysis, share information, and solve complex problems by discussing with MNGL.*

At MNGL, we want to streamline the gas utility workflows using this GIS platform. We want to extend the information model to represent how the gas systems are constructed, and to integrate with other information systems. This platform should possess the capability to be extended to meet any additional asset, workflow, or 3rd party system integration needs.

#### **Streamlining gas utility workflows**

**Distribution:** Leverage MNGL's geographic information to maintain comprehensive gas utility records, plan and conduct mandatory inspections, communicate with customers, and more should be done using this platform.

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**Transmission:** Create facility reports, survey assets, provide information to MNGL, and more to be managed from this platform.


**Gathering:** Organize MNGLs network assets, summarize facilities for annual reporting, collect system data in the field, and more to be accessed from this platform.

### **Cloud Services**


IoT involves the linking of physical entities (“things”) with IT systems that derive information about or from those things which can be used to drive a wide variety of applications and services which may be directly or indirectly connected or related to those things. IoT covers an extensive spectrum of applications, spanning enterprises, governments and consumers and represents the integration of systems from traditionally different communities: Information Technology and Operational Technology. As a result, it is important for IoT systems to have architectures, systems principles, and operations that can accommodate the interesting scale, safety, reliability, and privacy requirements.

There are several aspects that apply to IoT systems that affect their architecture and implementation, as follows:

- **Scalability:** Scale for IOT system applies in terms of the numbers of sensors and actuators connected to the system, in terms of the networks which connect them together, in terms of the amount of data associated with the system and its speed of movement and in terms of the amount of processing power required.
- **Big Data:** Many more advanced IoT systems depend on the analysis of vast quantities of data. There is a need, for example, to extract patterns from historical data that can be used to drive decisions about future actions. The extraction of useful information from complex data such as video is another example of analysis requiring large amounts of processing. The ability to mine existing data for new insights and the need to combine different datasets in novel ways are characteristics likely to be part of an IoT system. IoT systems are thus often classic examples of “Big Data” processing.

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- **Cloud computing:** IoT systems frequently involve the use of cloud computing platforms. Cloud computing platforms offer the potential to use large amounts of resources, both in terms of the storage of data and in the ability to bring flexible and scalable processing resources to the analysis of data. IoT systems are likely to require the use of a variety of processing software – and the adaptability of cloud services is likely to be required to deal with new requirements, firmware or system updates and offer new capabilities over time.
- **Real time:** IoT systems often function in real time; data flows in continually about events in progress and there can be a need to produce timely responses to that stream of events. This may involve stream processing; acting on the event data as it arrives, comparing it against previous events and also against static data in order to react in the most appropriate way. There is a parallel need to ensure that corrupted data is detected and not used – whether introduced by faulty sensors or malicious action – since the use of corrupted data could cause harm and damage to humans, equipment, and the environment.
- **Highly distributed:** IoT systems can span whole buildings, span whole cities, and even span the globe. Wide distribution can also apply to data – which can be stored at the edge of the network or stored centrally. Distribution can also apply to processing – some processing takes place centrally (in cloud services), but processing can take place at the edge of the network, either in the IoT gateways or even within (more capable types of) sensors and actuators. Today there are officially more mobile devices than people in the world. Mobile devices and networks are one of the best known IoT devices and networks.
- **Heterogeneous systems:** This applies to the sensors and actuators, but also applies to the types of networks involved and the variety of processing components. It is common for sensors to be low-power devices, and it is often the case that these devices use specialized local networks to communicate. To enable internet scale access to devices of this kind, an IoT gateway is used.

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- **Security and Privacy:** The question of the security and trustworthiness of distributed heterogeneous IoT systems is a hard problem whose solutions must scale and evolve with the systems. Data protection is necessary, including significant privacy concerns regarding data that relate to individuals. Gaining assurance that these systems are safe, secure, and resilient and uphold their stakeholder's expectations about privacy is especially challenging.
- **Compliance:** Providing confidence about the operation of these IoT systems is necessary both due to the regulations of *MNGL* and also the norms and expectations of the stakeholders of the IoT systems.
- **Integration:** IoT systems do not exist on their own but need to connect to existing operational technology systems like factory systems, building control systems, and other types of physical management systems as well as existing enterprise systems including enterprise applications and enterprise databases.

*Understanding IoT architecture builds on understanding mobile, web application hosting, and big data and analytics capabilities. The cloud components of IoT architecture are positioned within a three-tier architecture pattern comprising edge, platform and enterprise tiers.*

- The **edge-tier** includes Proximity Networks and Public Networks where data is collected from devices and transmitted to devices. Data flows through the IoT gateway or optionally directly from/to the device then through edge services into the cloud provider via IoT transformation and connectivity.
- The **Platform tier** is the provider cloud, which receives, processes and analyses data flows from the edge tier and provides API Management and Visualization. It provides the capability to initiate control commands from the enterprise network to the public network as well.

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- The **Enterprise tier** is represented by the Enterprise Network comprised of Enterprise Data, Enterprise User Directory, and Enterprise Applications. The data flow to and from the enterprise network takes place via a Transformation and Connectivity component. The data collected from structured and unstructured data sources, including real-time data from stream computing, can be stored in the enterprise data.

### **AWS Cloud Services**

Some services needed to allow data to flow safely from the internet into the provider cloud and into the enterprise. They include:


- **Domain Name System Server** - resolves the URL for a particular web resource to the TCP-IP address of the system or service that can deliver that resource.
- **Content Delivery Networks (CDN)** - support end user applications by providing geographically distributed systems of servers deployed to minimize the response time for serving resources to geographically distributed users, ensuring that content is highly available and provided to users with minimum latency. Which servers are engaged will depend on server proximity to the user, and where the content is stored or cached.
- **Firewall** - controls communication access to or from a system permitting only traffic meeting a set of policies to proceed and blocking any traffic that does not meet the policies. Firewalls can be implemented as separate dedicated hardware, or as a component in other networking hardware such as a load-balancer or router or as integral software to an operating system.
- **Load Balancers** - provides distribution of network or application traffic across many resources (such as computers, processors, storage, or network links) to maximize throughput, minimize response time, increase capacity and increase reliability of applications. Load balancers can balance loads locally and globally. Load balancers should




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be highly available without a single point of failure. Load balancers are sometimes integrated as part of the provider cloud analytical system components like stream processing, data integration, and repositories.


- **IoT Transformation and Connectivity** - enables secure connectivity to and from IoT devices. This component must be able to handle and perhaps transform high volumes of messages and quickly route them to the right components in the IoT solution. The Transformation and Connectivity component includes the following capabilities:
  - **Secure Connectivity** - provides the secured connectivity which authenticates and authorizes access to the provider cloud.
  - **Scalable Messaging** - provides messaging from and to IoT devices. Scalability of the messaging component is essential to support high data volume from MRS and CNG stations.
  - **Scalable Transformation** - provides transformation of device IoT data before it gets to provide cloud layer, to provide a form more suitable for processing and analysis. This may include decoding messages that are encrypted, translating a compressed formatted message, and/or normalizing messages from varying devices.
- **Application Logic** - the core application components, typically coordinating the handling of IoT device data, the execution of other services and supporting end user applications. An Event based programming model with trigger, action and rules is often a good way to write IoT application logic. Application logic can include workflow. Application logic may also include control logic, which determines how to use actuators to affect physical entities, for those IoT systems that have actuators.
- **Visualization** - enables users to explore and interact with data from the data repositories, actionable insight applications, or enterprise applications. Visualization capabilities include **End user UI, Admin UI & dashboard** as subcomponents.

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- **End User UI** - allows users to communicate and interact with MNGL applications, analytics results, etc. This also includes internal or customer facing mobile user interfaces.
- **Admin UI** - enables administrators to access metrics, operation data, remote control and various logs.
- **Dashboard** - allows users to view various reports. Admin UI and Dashboard are internal facing user interfaces.
- **Analytics** - Analytics is the discovery and communication of meaningful patterns of information found in IoT data, to describe, to predict, and to improve business performance. It covers the following capabilities for IoT:
  - **Analytics Data repository** - supports legacy, new and streaming sources, enterprise applications, enterprise data, cleansed data and reference data, as well as output from streaming analytics. Capabilities include:
    - **Exploration & Archive** (for storing, exploring and augmenting large data sets using a wide variety of tools);
    - **Deep Analytics & Modelling** (application of statistical models to yield information from large data sets comprised of both unstructured and weakly-structured elements);
    - **Interactive Analysis & Reporting** (tools to answer business and operations questions over Internet scale datasets);
    - **Data Catalogue** (results from discovery and IT data curation create a consolidated view of information that is reflected in a catalogue).

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- **Cognitive** - intelligent system that learns at scale, reasons with purpose, analyses to predict, to prescribe, and to discover from massive datasets of interconnected physical, social, enterprise and other entities, and closes the loop with machine-generated advice, assistance and actions, in a manner that self-learns and adapts, for enabling augmented human intelligence through man/ machine collaborations.
- **Actionable Insight** - insights that ultimately drive actions that may be used by business applications from data collected, processed and stored in the data repositories. Capabilities include:
  - **Decision Management** (analytics-based and operational).
  - **Discovery & Exploration** (exploration across a variety of sources to provide business users with new visibility into business performance);
  - **Predictive Analytics** (extracts information from existing datasets to determine the current state, identify patterns and predict future trends);
  - **Analysis & Reporting** (reports of operational and warehouse data to business stakeholders and regulators where big data typically increases the scope and depth of available data);
  - **Content Analytics** (enables businesses to gain insight and understanding from their structured and unstructured content);
  - **Planning & Forecasting** (enables faster and more efficient development of plans, budgets and forecasts by creating, comparing and evaluating business scenarios).
- **Streaming Computing** - accepts and processes in real time large volumes of highly dynamic, time-sensitive continuous data streams from a variety of inputs such as sensor-based monitoring devices and messaging systems. Capabilities include:

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- **Real Time Analytical Processing** (applying analytic processing and decision making to in-motion and transient data with minimal latency) and
- **Data Augmentation** (filtering and diverting in-motion data to data warehouses for deeper background analysis).
- **Process Management** - activities of planning, developing, deploying and monitoring the performance of a business process. For IoT systems, real-time process management may provide significant benefits.
- **Device Data Store** - stores data from the IoT devices so that the data can be integrated with processes and applications that are part of the IoT System. Devices may generate a large amount of data in real time calling for the Device Data Store to be elastic and scalable.
- **API Management** - publishes catalogues and updates APIs in a wide variety of deployment environments. This enables developers and end users to rapidly assemble solutions through discovery and reuse of existing data, analytics and services.
- **Device Management** - provides an efficient way to manage and connect devices securely and reliably to the cloud platform. Device management contains device provisioning, remote administration, software updating, remote control of devices, monitoring devices. Device management may communicate with management agents on devices using management protocols as well as communicate with management systems for the IoT solutions.
- **Device Registry** - stores information about devices that the IoT system may read, communicate with, control, provision or manage. Devices may need to be registered before they can connect to and or be managed by the IoT system. IoT deployments may have a large number of devices therefore scalability of the registry is important.

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- **Device Identity Service** - ensures that devices are securely identified before being granted access to the IoT systems and applications. In the IoT systems, device identification can help address threats that arise from fake servers or fake devices.


### **Security and Privacy of AWS**

Security and Privacy in IoT deployments must address both information technology (IT) security as well as operations technology (OT) security elements. Furthermore, the level of attention to security and the topic areas to address varies depending upon the application environment, business pattern, and risk assessment. A risk assessment will take into account multiple threats and attacks along with an estimate of the potential costs associated with such attacks. In addition to security considerations, the connecting of IT systems with physical systems also brings with it the need to consider the impact to safety that the IoT system may have. IoT systems must be designed, deployed, and managed such that they can always bring the system to a safe operating state, even when disconnected from communications with other systems that are part of the deployment.

- Identity and Access Management
- Data Protection
- Security Monitoring, Analysis, and Response
- System, Application, and Solution Lifecycle Management

### **Identity and Access Management**

As with any computing system, there must be strong identification of all participating entities – users, systems, applications, and, in the case of IoT, devices and the IoT gateways through which those devices communicate with the rest of the system. Device identity and management necessarily involves multiple entities, starting with chip and device manufacturers, including IoT platform providers, and also including enterprise users and operators of the devices. In IoT solutions it is often the case that multiple of these entities will continue to communicate and address the IoT devices throughout their operational lifetime.


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## **Data Protection**

Data in the device, in flight throughout the public network, provider cloud, and enterprise network, as well as at rest in a variety of locations and formats must be protected from inappropriate access and use. Multiple methods can be utilized, and indeed, in many cases, multiple methods are applied simultaneously to provide different levels of protection of data against different types of threats or isolation from different entities supporting the system. Communications link protection may be used in addition to individual data field level encryption and/or signing done at/in the device in order to provide both end-to-end and point-to-point communications protection. Data at rest in different formats may be encrypted at the field, database, and even whole disk/media level to protect against leakage and improper usage. Increased data collection also results in a need to consider potential privacy implications, requiring additional attention to data segregation, redaction, and special handling requirements.

It is important to consider whether the data involved in an IoT system includes **personally identifiable information** (PII) – which implies legal and regulatory obligations, sometimes termed “privacy.” In some cases, devices may be directly associated with individuals, or individuals may be the physical entities that are the subject of sensor data. If it is possible to associate the device or the data with an individual, then the data is likely to be PII. It is important to recognise that with enough of this observed information, the aggregate data could be used to identify the person it relates to, even where individual elements of data do not. As an example, a domestic gas meter generates readings that can be related to the individuals who live in the premises concerned – and thus the meter readings should be treated as PII. PII is usually the subject of laws and regulations and the IoT system must be designed to give appropriate protection to these types of data. Protections may involve where and how data can be stored, the identified owner of the information, and what data usage restrictions need to be enforced. Data protection considerations can have a wide range of implications.

As just one example for future, it may be the case that data collected by the device must be stored in the same vicinity where it is collected, either on the device or on an IoT gateway that is close to the device – it cannot be transmitted to a central location such as the provider cloud.

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### **Security Monitoring, Analysis, and Response**

Every system must have monitoring of the environment built in so that active attacks as well as anomalous behaviour is detected and acted upon. Because of the scale of IoT systems, both in the number of devices as well as the amount of information being processed, there is a requirement for automated response to known attacks as well as automatic detection of suspicious behaviour. Response to attacks and suspicious behaviour may include temporary isolation, quarantine, or removal of parts of the IoT system as well as having formal incident response processes for addressing vulnerabilities that are discovered after the systems have been put into service.

Like IT security, there is a need for disclosure of vulnerabilities such that all affected parties can implement appropriate mitigations, changes, and updates in a timely manner. Note that attacks could come in a wide variety of different forms. As just one example, an attack might come in the form of injection of fake, erroneous, or erratic sensor data into the IoT system to steer automated decision-making parts of the system to act in a desired (by the attacker) manner. Such attacks must also be expected, planned for, and responded to.

### **System, Application, and Solution Lifecycle Management**

Lifecycle management of the IoT system is complex, multi-faceted, and has relationships with identity management, device management, the supply chain, application and software development, through to system operations and change management of deployed and in-service systems. Attention to security in all of these areas is required in order to prevent a variety of attacks ranging from malicious code insertion to inappropriate firmware/software deployment, to effective cryptographic key management. Code, key material, and even physical components must be verified as they flow from procurement and creation through to their installation into the devices, IoT gateways, and systems that make up the IoT system.

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The IoT system should also provide the capability to update individual components in a secure way, both to address vulnerabilities and to address functional enhancements over the lifetime of the system. Similar lifecycle considerations apply to privacy and data protection – from “privacy by design” approaches during the creation and assembly of the IoT system through to data deletion when components are decommissioned.

### **Deployment Considerations**

Cloud environments offer tremendous flexibility with less concern for how components are physically connected. The need for advanced planning is reduced but still important. This section offers suggestions for better provisioning of data and computing resources. Initial Criteria

- Scalability & Elasticity
- Data Bandwidth
- Data Sovereignty
- Resilience
- CPU and Computation
- Data Volume
- Security


### **3 Functional Requirement Specification**

Since Automation Project includes Supply & Services the Functional Requirements are classified into two parts (Scope of Supply Installation & Commissioning and Scope of Services)


#### **3.1 Scope of Supply, Installation & Commissioning**

1. The AUTOMATION vendor shall undertake full responsibility for providing a complete and State of Art Scalable AUTOMATION system with open architecture, meeting the objectives, functional and specific requirements described in the tender.
2. The scope of supply and works of AUTOMATION shall also include fulfilment of complete AUTOMATION requirements for monitoring and control as per the present I/O point for various field devices and at least 50 % of capacity for future requirements.




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3. The AUTOMATION vendor's scope of supply and works shall include, but not limited to, all the activities of Project Management, Design, Engineering, Training, Factory Acceptance Test, Supply, Packaging, Forwarding, Transportation, Insurance, port handling, custom clearance, Receipt and Storage at site, Installation, Commissioning, Site testing, Test Run, Warranty, AMC, Quality control and Documentation with the Turn Key responsibility and meet the requirements of the tender, its objective, functional and specific requirements described in the specifications.
4. Material to be delivered and works performed shall be to meet the Technical Specifications and requirement described in the tender.
5. Supply of all items including all accessories, console desks, system cabinets, special tool, test equipment, Software, Installation Material, Spares etc. required to execute the project in all respects as specified in Tender. However, if any additional items are required to meet the functionality of the AUTOMATION System as per this tender, vendor shall highlight along with offer or otherwise during execution vendor shall supply the same without any cost and time implication.
6. Supply of Hardwired Signal Cable, Communication Cable, Power Cable, Glands, Conduits and laying of Cables (underground or aboveground), Termination at site locations between RTU and field units, in Control room for interfacing devices, instruments/marshalling racks/cabinets, serial cables & connectors including dressing, ferruling, glanding & termination etc. at both ends. All field instruments interconnections will be though Intrinsically Safe Barrier.
7. Design, engineering, supply, installation and commissioning of telecom hardware in form of GPRS based SIM cards.
8. Supply and laying of Telecom Cables and Connectors for interconnection between AUTOMATION equipment's with the Telecom Equipment's. The cabling will be done through proper conduits and proper sealing at both ends.
9. Performing all works required for Designing, Engineering, Testing, Supply, Installation, Interfacing & establishing with Communication system on dedicated Channels, PLC, Dispenser Cards, Odorizer unit, instrumentation & electrical system etc. (through RTU or


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GSM/GPRS polling), Commissioning (with supply of commissioning spares including consumables), Site Testing, Test Run and putting into commercial operation of the system complete in all aspects.

10. Any kind of electrical, instrumentation, mechanical & civil work (limited to AUTOMATION work) required to carry out fulfil the overall functionality of the AUTOMATION system.
11. The Electrical works associated with the Installation and commissioning of the equipment's, earthing of equipment's at all sites, powering of equipment's at all sites, termination of cables required.
12. Designing, Engineering, Testing, Supply, Installation and commissioning of AUTOMATION related hardware, software, networking equipment at MNGL control room. The AUTOMATION Servers shall be designed so that it meets the system loading requirement for future expansion.
13. AUTOMATION vendor shall ensure that the servers and workstations models meet the system performance and functional requirement specified in tender document and in case any up gradation or additional resources are required at any stage of project implementation for fulfilling the system performance requirements, the same shall be done by AUTOMATION vendor, without any price and schedule implications.
14. AUTOMATION vendor shall ensure that system support for maintenance, up-gradation and enhancement/expansion of the AUTOMATION system/software shall be available on payment basis for minimum of 5 years from the expiry of AMC.
15. AUTOMATION vendor shall ensure the completeness of the materials (w.r.t. Model No. and quantities of various equipment, hardware and software modules, cards, peripherals, software licenses etc.) to meet the complete requirements of this tender as part of their responsibility and any change/ modifications required for the same during detailed engineering to meet the requirements of the tender shall be done by the AUTOMATION Vendor without any delivery & cost implications to the COMPANY.
16. Training of Company's personnel in operation, maintenance, system internals, expansion/modification and any other details required for trouble free operation of installed AUTOMATION system along with communication system as proposed.

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17. Packaging, Forwarding, Transportation, Insurance etc. of the complete system.
18. Furnishing all documentation, drawing and other information required here-in including user operation and maintenance manuals, handbook of inventory of all the equipment supplied and installed. Documentation shall also include AUTOMATION application specific documents, Database documents, HMI documents, Web Server related documents, API documents etc. covering all the hardware and software aspects of entire supplied system including communication system as proposed.
19. Furnishing as built documentation, drawing and installation files of the entire system.
20. System warranty including all services and spares for operation and maintenance of the system
21. MNGL shall provide supply of 230V AC, 50 Hz in MCC, HO and CNG. MNGL shall provide UPS supply at CNG station. All necessary power distribution and required conversion for MCC, HO, and all site locations are within the scope of AUTOMATION vendor. Battery backup/UPS with minimum 6 hrs. backup/UPS at MCC shall be provided by AUTOMATION vendor. Power distribution cabinet shall be free standing enclosed type cabinet having 25% spare MCB's.
22. The Servers shall be designed so that it meets the system loading requirement for future expansion.
23. AUTOMATION vendor shall ensure that the servers and workstations models meet the system performance and functional requirement specified in tender document and in case any up gradation or additional resources are required at any stage of project implementation for fulfilling the system performance requirements, the same shall be done by AUTOMATION vendor, without any price and schedule implications.
24. AUTOMATION vendor shall ensure that system support for maintenance, up-gradation and enhancement/expansion of the AUTOMATION system/software shall be available on payment basis for minimum of 5 years from the expiry of AMC.
25. The AUTOMATION Vendor shall not subcontract the activities related to project management, system design, engineering, integration, training and factory acceptance testing to their subsidiary / associated company located elsewhere or any other agency.

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26. The AUTOMATION Vendor shall have single point responsibility for the successful execution of AUTOMATION & related telecommunication implementation.

27. In the tender the terms Owner, MNGL and COMPANY have been used synonymously. The terms Contract document, Contract specifications, tender specification have been used synonymously.

### **General Site Information**

The equipment shall be suitable for operation under the following site conditions.

#### **Sand & Dust**

With a built-up of dust on operational surface to a level such as may occur because of imperfections in the sealing of equipment, housing and conditions prevailing in sub-tropical dust conditions.

#### **Tropicalization**

The equipment shall be fully tropicalized.

#### **Shock and Vibration**

The equipment shall withstand transportation and handling by Air and Road under packed conditions, confirming to MIL 810B specs or commercial equivalent.


#### **Environment Specifications**

The equipment at Control Room (MCC) shall be in air-conditioned environment and shall operate satisfactory under the following conditions.

<b>Operation Temperature</b>	<b>: 5 to 35 Deg C</b>
<b>Operation Humidity</b>	<b>: 10-95% RH</b>
<b>Storage &amp; Transportation Temperature</b>	<b>: -30 to 60 Deg C</b>
<b>Storage &amp; Transportation Humidity</b>	<b>: 5-95% RH</b>

All the other equipment at fields (RTU and Telecom etc.) Shall be designed for Operation, Storage and Transportation under the non-air conditioned environmental with the following limits.

<b>Operation Temperature</b>	<b>: 0 to 55 Deg C</b>
<b>Operation Humidity</b>	<b>: 10-95% RH</b>
<b>Storage &amp; Transportation Temperature</b>	<b>: -30 to 60 Deg C</b>
<b>Storage &amp; Transportation Humidity</b>	<b>: 5-95% RH</b>

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The AUTOMATION equipment cabinet and power distribution cabinet to be supplied shall be constructed to allow free airflow to dissipate heat generated. RTU cabinets for installation in Hazardous Area shall be flame proof and weatherproof enclosure (IP54).

#### **Area and Zone Classifications**

The Main Control Centre location is classified as Safe Area. The RTU locations, where it will be installed inside Electrical room/Control room are classified as Safe Area. The RTU locations, where it be installed in open atmosphere or inside CNG compressor area classified as Zone 1 (All the necessary provisions have to be done for Zone 1 installations.)

#### **Surge Protection, Transient Suppressors, RFI Filters**

Card level transient suppressors shall be provided in the RTUs wherever necessary. All the equipment shall be designed with built-in safety to protect against the effects of monitor induced high voltages, effects of surges, transients (RF). Necessary surge protection device shall be provided as per the recommendation of the equipment supplier for all the power supply / signals.

#### **Earthing**

Dedicated Cu - Earthing Pit for all locations shall be provided by AUTOMATION vendor. The earth resistance shall be less than 1 ohm. AUTOMATION vendor shall also take care of onwards connections from equipment to the AUTOMATION / RTU / Telecom etc. and system earthing pit.

#### **Safety Requirement**

It is the intent of the COMPANY that operational hazards be reduced to a minimum. The AUTOMATION vendor shall use sound engineering judgment to complete an installation that will perform the required function without compromising this aim. All control shall operate in a failsafe mode. A fail-safe mode is defined as plant equipment or system which fails shall do so to safe condition.


AUTOMATION vendor shall ensure that equipment shall not be damaged due to blackouts/burnouts. Further AUTOMATION vendor to indicate, Steps to be taken for fail safe operation of the system under following conditions.

- Power failure
- Voltage variation more than +/- 10%
- Frequency variation more than +/- 3%
- Air Conditioning failure
- Transient in power supply

Following HSS&E requirements are to be complied by the successful AUTOMATION vendors.

All personnel involve in the job must undergo the HSSE induction in prior to start the activity.

HSSE induction training shall be organized by MNGL HSSE department.

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Prior to assigning the job the concerned departmental executive engaging the contractors shall brief about the job, its safety requirements and applicable rules and regulations to be followed.

The contractor shall submit the detail work procedure of the job to MNGL O&M department prior to start the work.

The contractor shall ensure that that electrical installation or usage of electrical equipment must conform to the hazardous area classification norm as given below:

**Zone 0:** No electrical equipment shall be used in this area. Where it is essential to use switchgear and control gear, apparatus with type “i” protection shall be used.

**Zone 1:** Electrical equipment such as motors, lighting fittings, switchgear, control gear and generators shall be installed with type of protection ‘d’ (flameproof). Heat tracing as suitable for Zone 1 shall be used. Use of permanently installed diesel engines is to be avoided, but where necessary, the enclosures are to conform to IS 5571:2000.

**Zone 2:** Electrical equipment shall be used as suitable for Zone 1 area or with other permissible types of protection, viz. motors with type of protection ‘d’, ‘n’ or ‘e’, lighting fittings with type pf protection ‘d’, ‘n’ or ‘e’, switchgear and control gear with type of protection ‘d’, and generators with type of protection ‘d’, ‘n’ or ‘e’. Heat tracing as suitable for Zone 2 shall be used. Use of permanently installed diesel engines is to be avoided, but where necessary, the enclosures are to conform to IS 5571:2000.

The contractor shall ensure that the contract employee shall wear appropriate PPEs i.e. Safety shoe, helmet etc. as per the requirement of the site.


The contractor shall follow the permit systems, the standard operating procedure and all the applicable rules and regulations regarding accident reporting, usage of PPE’s and action during emergency.

The work permit shall cover:

- Height Work
- Electrical Installation Work
- Hot Work
- Excavation Work
- Any other non-routine work

Job involving working at height must be carried out using full body harness (CE compliance EN 354) and gravity / double security locking system (CE EN 353-2). Polyamide rope conforming to EN 354.

Any working at height related activity has to be carried out with appropriate Permit.

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If hot work or any other work carried out which can create spark or fire, then 1 nos. of 10 kg DCP / ABC type fire extinguishers must be made available prior to start of work at site. (Extinguisher should have tag on it indicating testing & expiry date on it.)

The contractor must have relevant licenses (like PWD for electrician etc. for electrical work). Drilling machine used by contractors should in good working conditions and fiber body. Electric wire used for machine should not have joints. The electrical tools and hand tools should be as per proper safety standards. The electric hand tool shall have ELCB to prevent shock. Use appliances with 3 pin plugs and connect them to 3 pin sockets only. Property inspected electric resistant gloves must be worn when working near “Live” wires carrying 440 V or more.

Under no circumstances, the contractor should deploy minor employees (below 18 yrs.) at their site for execution of job.

The contractor should make first aid box available at the site.

The contractor should display the signboards like;

- Inconvenience regretted, work in progress.
- No smoking sign board.
- Name of the contractor & contact details.

The contractor shall keep a supervisor for supervising the work. The supervisor shall instruct his labour to adopt the safe work practice.

Any incident/accident at site shall be informed by the contractors to the MNGL promptly.

The AUTOMATION vendor shall ensure that the installation of software shall have proper security measures though fire wall to protect the operational data from hackers.


The AUTOMATION vendor shall ensure to follow all the Safety norms as per MNGL standards.

### **System Availability**

The AUTOMATION System availability of 99.98% shall be ensured by the AUTOMATION vendor. The AUTOMATION vendor shall ensure that calculation of availability takes into account of MTTR of RTU as 8hrs and Control Room equipment 2 Hrs. Future expansions shall also to be considered.

### **Electromagnetic Compatibility – EMC**

The equipment shall be efficiently screened against EMI, RFI and Conductive Interferences and shall not interfere with the other equipment in the vicinity or installed in the same building. RTU shall meet one of the relevant EMC standards and specify in their offer. The equipment shall be required to meet one of the relevant EMC standards (IEC, MIL, VDE, BS, IEEE etc.)

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#### **Future Expansion**

The supplied AUTOMATION software shall be adequate and license without adding any software to cater for future expansion.

#### **Installation Material**

All installation material such as AC and DC cables, both digital and analog Instrumentation cables, telecom interface cable, serial interface cables, data cables, cable trays/conduits, relays, connectors, switches, fuses, terminations, distribution boxes and other items required but not mentioned herein shall be provided by AUTOMATION vendor.

The quality of materials used shall be of the highest order and shall conform to the international standards and safety standards as per relevant hazardous area classification.

#### **Finish**

All frame and steel work of the cabinets shall be degreased, then phosphate treated or coated with primer, followed by at least two undercoats and a final coat of matte finish enamel paint of light admiralty grey colour (IS 697). The finish of the equipment shall be of finest quality and capable of long and unattended service. The inside of cabinets shall be painted pale cream colour (IS 352). The Colour of the cabinets may be changed during the engineering stage by MNGL. All the cabinets shall have "Nameplates" correlating with the type and location of the cabinet.

#### **Civil, Electrical and Mechanical Work**

Any kind of Civil, Electrical & Mechanical work required for completion of AUTOMATION implementation, shall be done by AUTOMATION vendor (excluding construction of MCC).

#### **Spares**


The AUTOMATION vendor shall cover the various categories of spares included along with corresponding activity / services as per listed part of lump sum price

Commissioning Spares including consumable as part of commissioning activities. The consumables shall be adequate and complete, and shall include a minimum paper, print heads, cartridges, disks, tapes etc. as required for printers and workstations (Any consumable used during testing & commissioning shall be replace with all new during handing over of the system).

Bidder shall attach a list of 2 years all Operation & Maintenance Spares along with unit rates valid till completion of AMC.

Vendor shall provide the address, contact person, fax and telephone number of the manufacturer of the spares parts. The vendor shall warrant that spare part for the system would be available for minimum 8 years after warranty period (after owner's take over). After this period if the vendor discontinues the production of spare parts, then he shall give at least 12 months' notice prior to such discontinuation so that OWNER may order the requirement of spares in one lot.



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### **Mandatory Spares**

Mandatory spares shall be offered as per the Mandatory and Optional Hardware SOR 4. These spares shall be maintained by the bidder and as when required same can be invoiced to MNGL. Offered price should be valid till the completion of AMC period.

### **Commissioning Spares**

The commissioning spares shall be arranged by the vendor to cater to the needs/requirement during installation, commissioning, site acceptance testing, trial run and warranty period. These spares shall be readily available with the vendor.

The commissioning spares are different from Mandatory spares and vendor shall not use mandatory spares as commissioning spares.

Vendor shall provide a list of commissioning spares with the bid.

### **Documentation**

The language used in all correspondence, documentation, literature, drawings, markings etc. shall be English.


AUTOMATION vendor shall furnish all relevant technical manuals, literature and other technical data as required at the various stage of the Project.

All AUTOMATION engineering drawings & documents shall be submitted in Hard copy and Softcopy to COMPANY for review.

All final engineering drawings & documents shall be submitted in Hard copy and Softcopy to COMPANY after review.

Following documents needs to be submitted along with the bid for technical evaluation.

1. Detailed System Architecture for each location/site.
2. Detailed BOM per site with Make and Model number of each Hardware
3. Communication Media /telemetry architecture and BOM for each site and overall, along with bandwidth calculations.
4. Power consumption details with UPS/battery backup calculations correlating with offered UPS/battery backup system.
5. Communication Details for each Hardware.
6. Communication Media Details with feasibility survey report.
7. Compliance of Hardware and Software.
8. System Description/ Specification for Workstation and Engineering Station
9. RTU / IoTs Specification
10. Software Functionality Matrix

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11. Check List
12. Project Completion Schedule
13. Organization Details (Location, Manpower, Nature of Business etc.)
14. Reference List along with Completion Certificate

Documents required for approval during engineering stage shall be finalized during KOM. However minimum documents shall be Functional Design Specifications, BOM, Data Sheets, System Architecture, Communication Details, Panel GA / IGA, AUTOMATION, FAT, SAT etc. The contract document would be the Purchase Requisition (after award of contract and the same shall have higher precedence than all approved project documents.

Following approved/as built engineering documents/drawings and other system manuals are to be submitted in three hard copies and two soft copies.:

#### **FUNCTIONAL DESIGN SPECIFICATIONS (FDS)**


AUTOMATION vendor to note that the AUTOMATION System tender completely covers the operational and functional requirements of the MNGL pipeline and associated network and the requirement of AUTOMATION. FDS shall be to focus on the implementation aspects of these requirements.

FDS shall be custom defined for this project and include the implementation aspects of tender requirements in the following sections.

FDS shall cover AUTOMATION implementation aspects [Complete details of systems configuration, MCC, HO, RWS philosophy, Redundancy and backup aspects (system failovers & fail backs) covering implementation aspects of tender requirements, Interfacing, Integration and communication aspects between various subsystems including Telecom system, communication protocol interfacing with Internet Enabled Devices (Flow computers, PLCs and other IEDs), description of AUTOMATION/ third party software interface, system resource sizing and performance parameters, system timeouts, computers switchover timings, Display updates, Display call-ups, poll time calculations etc.]

#### **Human Machine Interface (HMI) Document**

The HMI documents shall be generated for AUTOMATION systems covering all the displays, graphics and reports, in colour printouts ensuring proper view ability and legibility. The colouring scheme for various displays taking care of the colours for the titles/ headings/ sub-headings, background colour, static text, dynamic values, pipeline, Sectionalizing Valves and other equipment etc. shall be highlighted in the dedicated section of the HMI document. Philosophy for displays of alarms of different criticalities, acknowledge status etc. will be highlighted in the HMI document.

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#### **AUTOMATION telemetry points database document.**

AUTOMATION vendor is required to incorporate the complete requirements of telemetered points for AUTOMATION system taking the inputs from the I/O point database (I/O Point list) which shall be provided by COMPANY during detail engineering. The information like engineering units, ranges, alarm limits, set points, digital contact configuration etc. shall be taken care of by AUTOMATION vendor during detailed engineering. All the calculated, server resident points and system status related points are also to be included in this document.

#### **Interconnection Drawings and Equipment Drawings –**

1. Drawings showing interconnections of various AUTOMATION
2. equipment and interconnections of AUTOMATION equipment with
3. Telecom and IEDs at MCC, HO, Remote Stations.
4. RTU cubicle typical layout, RTU internal layout and interconnection
5. drawings for each type of RTU, PDB internal layout, Modem Rack
6. internal lay out, Internal layout of AUTOMATION cabinets,
7. Drawings of all AUTOMATION cabinets and Console (HMI) Desk
8. drawings.
9. Construction drawings/ documents: -  
Mounting arrangement of each cabinet, cable schedule, Termination & Wiring diagrams, grounding schemes/ diagrams.

#### **PCUR Document:**

Power Consumption and in rush current for each type of station with equipment wise break up.

#### **FACTORY ACCEPTANCE TEST (FAT) PLANS AND PROCEDURE DOCUMENTS**

FAT document for AUTOMATION systems shall contain test sections to test all the aspects of AUTOMATION System as covered in Purchase Requisition (PR), FDS and HMI documents.

#### **SITE ACCEPTANCE TEST (SAT) PLANS AND PROCEDURE DOCUMENTS**

SAT document for AUTOMATION systems shall contain test sections to test all the aspects of integrated AUTOMATION System.


#### **AUTOMATION DOCUMENTATION**

AUTOMATION documentation covering engineering manuals, user manuals, installation, operation & maintenance manuals for all the supplied software, hardware and equipment.

#### **OTHER DOCUMENTATION**

Bill of Material, Quality assurance plan, Installation & Test procedure (which also includes the mounting arrangement of each cabinet), Site execution plan.

AUTOMATION Vendor shall take care of project specific customization of AUTOMATION system for meeting the project specific functionalities.

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The review by COMPANY however does not absolve the AUTOMATION vendor of his responsibilities to satisfy the requirements of contract document and install & commission the AUTOMATION system accordingly. AUTOMATION vendor is required to make necessary rectification in the AUTOMATION system to meet the requirements of the contract document at any stage of system implementation, without any implication of cost and schedule to the COMPANY.

It is AUTOMATION vendor's responsibility to incorporate all the comments of the COMPANY in one revision itself. AUTOMATION vendor shall be responsible for incorporation of comments in the AUTOMATION system at any stage of the system implementation, without any implication of cost and schedule to the COMPANY.

AUTOMATION Vendor shall take care of the complete requirements of designing, generation and implementation of AUTOMATION displays for monitoring & control, AUTOMATION reports, AUTOMATION alarms/ events, AUTOMATION trending taking care of the requirements outlined in this specification for AUTOMATION implementation. AUTOMATION vendor shall furnish the point wise response to COMPANY's comments indicating the document section/clause/page no. reference where the same has been included in the revised document. The body of the document and corresponding pages will show the revision bars only at the places where the revision has been carried out. COMPANY will be required to check the revised document w.r.t. these changes only, while considering that rest of the document has remained unchanged.

### **Training**


AUTOMATION Vendor shall provide training to the COMPANY of the entire system for technical, maintenance and operator personnel. COMPANY will bear the expenditure pertaining to travelling expenses, daily allowance, hotel expenditure and local conveyance for Company's personnel for attending the training.

### **Factory Training:**

AUTOMATION vendor shall train MNGL's Engineers for total duration of min 10 days for each batch (two separate batches) for AUTOMATION system in AUTOMATION vendor's own training school / factory place. The training shall include hands on experience of the offered system.

The factory training shall be provided min 30 days before the arrival of system (dispatch of material to site for Installation) so that MNGL engineers have adequate knowledge before start of system installation and commissioning in MCC.

The course shall be designed to train in all aspects of System Engineering, equipment operation and functional details, theory of operation of equipment's, troubleshooting and familiarization with the equipment at card level, the operation of equipment and system including testing of equipment/sub-assembly, preventive breakdown, trouble shooting and normal maintenance activities. All equipment used for training shall be identical to those supplied for site installation.

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Vendor shall provide comprehensive documentation, course material, manuals, literature etc. as required for proper training of personnel at his own cost. Consolidated and comprehensive documentation shall be available to each participant. After the completion of course, all such materials shall become the property of the OWNER. Vendor shall update the course material & manuals in case there are any changes owing to revision/modifications in equipment/system specifications.

Vendor shall, twenty (20) days prior to start of training, send complete training program including details of each course, duration, subject matter etc. The Owner/engineer reserves the right to suggest any additions/deletions in the program which shall be incorporated by the Vendor at no additional cost.


The depth of the training required shall be adequate to enable the COMPANY to (but not limited to):

1. Operation & maintain system.
2. Add new RTUs and change media of communication between MCC and RTUs.
3. Generation and modification of HMIs (graphics & reports) and Point database. • Integration of new IEDs like PLCs and Flow Computers with the system.
4. System internals.
5. Integration with third party software using OPC.
6. Backups and other jobs related to AUTOMATION system housekeeping.
7. Loading of system software on new machine.
8. Interfacing with communication system.
9. System software installation, version upgrade and configuration
10. Logic configuration
11. Database design
12. Graphics and display configuration
13. Reporting
14. Applications programming
15. Trouble shooting and Maintenance of AUTOMATION & Interfacing communication system.

The training shall be specific to the AUTOMATION system installation, not general in nature and includes:

1. The provision of site lectures.
2. Comprehensive explanatory and guidance notes.
3. Visual and audio aids.
4. Practical hands-on training.

The material used to provide the training (slides, notes, etc.) shall remain the property of the Owner following completion of the training courses.

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The personnel offered by the Bidder shall be suitably experienced and qualified and be sufficient in number to ensure that the Owner's staff are effectively and comprehensively trained.

Owner personnel shall be trained in each aspect of the system required for day-to-day and emergency operations. Training courses shall be given for:

1. Operators,
2. Application and system programmers,

### **Site Training**

AUTOMATION vendor shall train COMPANY's Engineers for minimum 3 days for each batch (four separate batches of 4 engineers) on operation and maintenance of the MNGL AUTOMATION system.

### **Test Equipment**


AUTOMATION vendor shall include adequate test equipment and tools for testing and calibration of all equipment supplied by him.

Test equipment shall include of latest specification however following as a minimum:

1 No. Laptop for programming. The Laptop shall be minimum Intel Octacore Processor based laptop with active matrix display and fully configured with all RTU configurations and diagnostics software. The PDT shall be loaded and configured with all necessary software required for maintenance and modification of RTUs, their interface programs with IEDs etc. All necessary cables and connectors shall be supplied with the Laptop. Software to test interfacing with IED and MCC will also be loaded in the Laptop.

### **System Performance Acceptance Test (SPAT)**

1. The minimum period for the SPAT shall be 720 hours (30-days).
2. The AUTOMATION system equipment shall have minimum Availability of 99.98% during the 720 hour SPAT period. The permissible downtime of 0.02% shall be cumulative. The downtime shall not exceed 1.40 hours during the 720 hour SPAT period to obtain the required availability. In case of downtime more than the permissible limit then 1.5% of total contract value shall be deducted and vendor shall rework on this, and offer SPAT again.
3. Upon failure of SPAT, the test time shall begin following the longest downtime period and continue until successful completion of a 720- hour test period window.
4. SPAT shall be carried out for individual subsystems and system integration during each phase of the implementation.
5. Vendor shall offer maximum thrice for the SPAT. On failure of third attempt MNGL reserves the right to cancel the order.
6. On failure of SPAT, 1.5% of total contract value shall be deducted each time. Additionally for second or third attempt additional deduction of 0.5% of total contract value shall be applicable.
7. SPAT shall be carried for the entire system as mentioned in Call Order.
8. On completion of successful SPAT, Warranty period of entire system as mentioned in Call Order shall start.


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### 3.2 Scope of Installation & Commissioning

The installation and commissioning of all the equipment at various sites including the activities of instrumentation signal interconnection, electric works with power supply distribution and grounding works and other necessary facilities and coordination / interfacing with various sub-contractor is the responsibility of the AUTOMATION vendor.

1. AUTOMATION vendor's scope includes supply of cables, glands and interconnection of cabling and accessories including cable routing between the various equipment.
2. AUTOMATION vendor shall be responsible for proper selection of the RS232/RS485 cables for ensuring good quality communication with telecommunications, PLCs, Flow Computers etc.
3. All the erection work shall be carried out as per the established recommended practices and best workmanship.
4. AUTOMATION vendor shall bring all installation aids, test equipment, qualified and experienced personnel, to carry out the job successfully. A list of the same shall be submitted to the COMPANY for review.
5. All technical personnel assigned to the site by AUTOMATION vendor must be fully conversant with the specific system and its software packages. The AUTOMATION vendor's field personnel shall have both hardware and software capability to bring the system online quickly and efficiently and with a minimum of interference with other concurrent construction and commissioning activity.
6. The commissioning spares for all the items / equipment is included along with commissioning services as required to commission the complete system. The consumable required during commissioning of system is included as part of the commissioning spares.
7. AUTOMATION vendor shall as this own expense supply and provide all the equipment, tools, temporary works materials both for temporary and permanent works, labour, supervisors, engineers and specialist movement of the supplied equipment at the site, required for installation, commissioning, execution and completion of the works. The AUTOMATION vendor shall make his own arrangements at their cost for the transport where necessary of their staff and labour to and from the site of the works.
8. The AUTOMATION vendor's responsibility at site shall include all the activities necessary to be performed to complete the entire job as per the contract requirements including the following minimum. a. Receipt of hardware, software and checking the adequacy and completeness of supply. b. Installation of the complete system including power supply, earthing, cable terminations, civil & electric works. Obtaining information /coordination /interfacing with various other contractors through COMPANY. c. Checking of equipment installation. d. Checking of interconnection and overall system functionality. e. Online / Offline debugging of the system. f. Coordinating /Interfacing with other contractors wherever necessary though COMPANY. g. Online testing and commissioning of AUTOMATION system.
9. The AUTOMATION vendor to note that there could be minor database changes, graphics, reports and logic changes during site commissioning phase as required by the



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COMPANY. The same to be taken care by the AUTOMATION vendor as part of the project requirement.

10. The AUTOMATION vendor shall ensure full compliance of the safety requirements as mentioned.

### **3.3 Scope of Services**

1. The Automation Project will include gathering of all data/operating parameters from all the field equipment viz. CNG Compressor, CNG Dispenser, LCV Filling point mass flowmeter, RFID readers etc. through local RTU and **push** the same into the **dedicated** server periodically without human intervention through GPRS/Ethernet based communication protocol.
2. A web-based application to be designed for human interface/GUI, which will display all the collected data in the server on any internet enabled device, through proper login credentials with Fire walls.
3. The server will be cloud based. No physical server to be installed separately in MNGL premises.
4. The Web-Application will be able to display data, station wise as well as email the same to pre-defined email addresses at a pre-defined time (0600 HRS), on daily basis.
5. The vendor has to design an FTP server to collect data from the Web-Application in a pre-defined format so as to interface with SAP to process the billing for individual CNG station.
6. The web-application will have provision for remotely shutting down CNG compressor of any given station in case of EMERGENCY.
7. The bills for each CNG station to be generated on fortnightly/monthly basis and must be mailed to the respective customers as well as MNGL. This will be in the scope of SAP vendor, but the data must be transmitted to the FTP server by the Web-Application.
8. The data that will be pushed by the RTU to Web-Application must have an intermediate stage where-in the operator at the control room can validate the data before the data is pushed to FTP server, for billing. Without operator validation the Web-Application will not push the data into the FTP server.



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9. Each RTU should have in-built memory for storing data of at least 1 GB, to facilitate data storage in case of communication failure between RTU and the cloud server. The RTU must push the entire data stored, after recovery of communications. The RTU should store data of at least past 72 Hours and continuously over-write after every cycle, after pushing the data into cloud server.

10. The RTU will push data into the Web-Application at an interval of 5 minutes, which will enable the operator to monitor live status of the equipment.

11. The entire system should employ proper security measures/encryption and decryption to avoid data theft.

12. All data should be communicated through CAT6 cables from equipment to RTU and then from RTU to cloud server through Ethernet or GPRS as per availability at the site, preferably Ethernet.

13. All the data will be made available in a Master Control Room, where MNGL personnel/operator will be monitoring the data 24X7 basis. There will be provision for singular viewing on authorized log in ID and credentials, at any location in any internet enabled device apart from MCC. The structure of MCC will be defined in the subsequent pages.


14. Both Read and Write access will be required for all equipment for specific parameters

15. After project completion a minimum of 5 years AMC service has to be provided by the vendor, which will include all aspects of the project. During this period the bidder has to implement all necessary changes pertaining to Operational requirement as suggested by MNGL.

16. The design of the Web-Application will be in consultation with MNGL. No predefined application will be entertained. The application will be MNGL specific and MNGL centric, hence the bidder has to build the application from scratch. Source code of the application to be handed over to MNGL with exclusive rights to avoid further copy-right infringement.

17. All critical parameters/alarms to be sent to registered cell phone numbers through SMS alerts, notifying the user/management for corrective measures.

18. Mandatory Spares to be provided by vendor after commissioning of the entire system.

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19. Firewall and GPS based master clock to be provided and synchronized for accurate data collection. 20. All work to be done as per PNGRB guidelines.

**SCOPE OF SUPPLY AND SCOPE OF WORK:**

The scope of supply and scope of work will be defined herewith for individual areas and must be adhered to by the bidder on holistic basis.

**FIELD AUTOMATION:**

Field Automation will be divided basically into 2 parts, wherein one part will be specifically addressed for on-field equipment and the other part will be specifically for the RTU to be installed in all CNG stations, to link the data to the cloud server.

**SCOPE OF SUPPLY (On-field Equipment):**

MNGL has installed CNG compressors at its online stations, both currently having Siemens S300 PLC system to govern the working of the compressors. Whereas in Booster stations, Booster compressors have been installed which use micro controller/relay-based system to control the compressors.

**For the Online Compressors following items are to be supplied during the project:**


1. CP340/341 Redundant Communication card for Siemens S300 PLC as per SOR and requirement.
2. Extra rack for installation of cards/modules.
3. Extra DI module.
4. CAT6 cable of at least 30 meters.
5. Cable glands
6. Ethernet connectors

**For Booster Compressors:**

1. CAT6 cables of at least 30 meters for linking booster flowmeter.

**For LCV Flowmeters:**

2. CAT6 cables of at least 10 meters to link flowmeters (Emerson/E&H make) to nearest CNG Compressor PLC.
3. Power supply cable of 2 core 2.5 sqmm aluminium armoured cable of at least 30 meters.

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4. Provision for installation of Pressure Transmitter at LCV filling points at Mother Stations and Decanting points at Daughter Booster stations to monitor filling pressure.
5. The entire tubing modification needed to install the pressure transmitters has to be done by the vendor.

**For Dispensers:**

1. CAT6 cable of at least 50 meters for each dispenser.
2. Power supply cable of 2 core 2.5 sqmm aluminium armoured cable of at least 50 meters each for RFID tag readers.

**Miscellaneous:**

1. Ex-Proof power distribution board.
2. 3 Core 2.5 sq. mm aluminium armoured cable 50 meters.
3. Metal conduits along with fasteners to be provided as per cable length.


**SCOPE OF SUPPLY (RTU):**

1. Remote Terminal Unit (henceforth RTU) will have provision for both RS 232 and RS 485.
2. All data collected from field instruments to be stored on-board in the RTU till it is not sent to the webserver, threshold time of at least 72 hours.
3. Both read/Write access to be provided in the RTU.
4. RTU must have 4G/5G GPRS along with Ethernet connectivity options.
5. Switchover time between GPRS and Ethernet communication must be within 5 minutes of failure of communication in any of the above protocols mentioned, i.e. if the initial communication protocol is GPRS, then on failure of GPRS signal the RTU must switchover to Ethernet based communication within 5 minutes of the issue.
6. RTU must be equipped with Analog Input, Digital Input and Digital Output card/modules (minimum 2 channels for each Input & provision for expansion) to receive data and provide commands as per requirement. The RTU must be capable to collect data from all field equipment as mentioned above viz. dispensers, Flow Transmitters, Pressure Transmitters etc.


**SCOPE OF WORK:**

The scope of work will include but not limited to the following:

1. All cable laying and termination including power cable and communication cable will be in the scope of the bidder.

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2. All civil work i.e. conduit installation, trench modification, RTU installation etc. will be in the scope of the bidder.
3. PLC logic modification for remote shut down will be in the scope of the bidder, in consultation with the OEM. MNGL will facilitate the work.
4. Supply, Installation and configuration of redundant communication card in the PLC rack will be in the scope of vendor, in consultation with OEM. MNGL will facilitate the same.
5. Data from the dispenser will be communicated to the RTU through CAT6 cable.
6. LCV flowmeter to be connected to RTU through CAT6 cables. Pressure Transmitter with suitable isolation valve to be installed in the SS tubing for fill pressure monitoring of the LCV. Data of the PT will be communicated to the RTU along with FM data.
7. MNGL will supply required electricity and access to its sites for the vendor personnel as and when required.
8. Any software/program towards development of the entire project will be handed over to MNGL, by the vendor without any further cost implications apart from the SOR.
9. Licences for any software related to the project to be made available for lifetime.
10. The vendor will make provision to furnish in printed format the sale data, invoice etc. for individual CNG station as per the format prescribed by MNGL during the commissioning phase.
11. Packaging, Forwarding, Transportation, Insurance etc. of the complete system will be in the scope of the bidder.
12. MNGL will provide necessary documents and literature for all the installed equipment to facilitate the process of automation.
13. For CNG stations having booster compressor packages the vendor will have to bring the data of all installed dispensers and the LCV decanting point mass flowmeter into the server through RTU.
14. GPRS enabled SIM cards and Ethernet connectivity provision will be in the scope of MNGL. Maintenance of the cellular and Ethernet network will be in the scope of MNGL.
15. The vendor to provide adequate protection to the equipment to be installed by him/her from environmental impact and voltage fluctuations. For example, canopy covers, weather proof IP65, ex-proof casings etc. for equipment to be installed in open areas.
16. All electronic/electrical materials to be used should have proper approvals to be used in Zone-1 classified areas, e.g. ATEX approvals etc.
17. All equipment provided by the vendor must be compatible/interchangeable with the equipment installed in MNGL premises.
18. There should be additional ports for 2 no's of dispensers and 1 compressor in the RTU to accommodate future expansion in any given CNG station.
19. All equipment must be compatible and sturdy enough to operate in high heat and dusty environment.

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20. The vendor must provide mandatory spares as recommended in the tender document after commissioning of the entire system or after completion of AMC period.
21. All equipment must be provided with proper earthing as recommended by MNGL i.e. individual earthing must have resistance of 0.5 ohms. Earthing will be in the scope of MNGL.
22. In case of failure of Communication, RTU shall store/archive the Data in its memory and upload the same on resumption of Communication (history back fill). AUTOMATION vendor has to ensure that uploaded Data will be logged in AUTOMATION and shall be available in Trends, Alarms etc.

#### **CONTROL ROOM AUTOMATIONS:**


All the data which will be collected through the on-field devices needs to be uploaded and delivered to the server and displayed in the control room specifically designed for the said purpose. The Control room automation will be further divided into 2 parts namely Web-Application and Server areas.

#### **Web-Application and Server Scope of Supply and Scope of Work:**

1. All data from on-field RTU of all CNG stations to be automatically pushed at the prescribed intervals into the Web-Application server.
2. Web-Application should be less than 200 MB in size to maintain minimum usage of data space, this excludes the database storage.
3. Web-Application should be flexible enough to accommodate future expansions in CNG stations i.e. the Web-Application should be expandable.
4. Web-Application design should be pre-approved from MNGL. The vendor must submit a page-by-page design and get that approved by MNGL before actually designing the Application.
5. Entire Web-Application will be hosted on cloud server with proper redundancy.
6. The source code for the Web-Application will be submitted to MNGL after commissioning of the entire system.
7. The Web-Application should be able to display the following data:
  - 7.1 All compressor parameters
  - 7.2 Current, hourly, daily, weekly, fortnightly and monthly suction, discharge, Internal Consumption, Dispenser sale, LCV dispatch data, PMPML Bus filling data
  - 7.3 Graphical representation and comparison of data for easy inference for the operators monitoring the stations.
  - 7.4 Gas reconciliation, calculation and report for each station, with respect to suction, discharge and sale data.
  - 7.5 Alarm pop-ups and colour codes for sub-critical and critical alarms on main screen.
  - 7.6 Graphical chart for station wise sale etc. to be represented on separate screen.


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- 7.7 Provision for CCTV footage display. Data from Gas Chromatograph/Flow Computer installed at MS Chikhli to be displayed and taken into calculation for GCV and NCV values.
- 7.8 Web-Application must generate SMS for critical alarms, breakdowns or abnormal operating conditions and send them to registered mobile phone numbers.
- 7.9 Web-Application must email data to registered email ID on daily basis at 0600 Hours positively for DPR and daily monitoring.
- 7.10 Entire communication will be based on MQTT protocol (Message Queue Telemetry Transport Protocol) for critical parameters and CoAP for non-critical parameters as per tender document.
- 7.11 All IoT/RTU should be capable of update remotely from Web-Application interface. No need to individually update each RTU/software in field devices.
- 7.12 The Web-Application and RTU must be designed for Over The Air updates (OTA).
- 7.13 Per-device public/private key authentication using JSON Web Tokens (JWTs, RFC 7519). This limits the surface area of an attack, because a compromised key would affect only a single device and not the whole fleet.
- 7.14 Web-Application should provide support for RSA or Elliptic Curve algorithms to verify signatures, with enforcement for strong key sizes.
- 7.15 There should be support to rotate keys per device by allowing concurrent keys to be registered, and support for expiration time per credential.
- 7.16 Both Full and Incremental back-up system should be provided, where-in incremental back up must happen on daily basis and full back-up should be done on monthly basis.
- 7.17 Preferable server AWS Ec2 Instance t2.xlarge or equivalent.
8. Server specifications:
  - 8.1 4 vCPU, 16GB RAM, 3.0 GHz/300GB Application Server
  - 8.2 Intel Scalable Processor, High frequency Intel Xeon processors or equivalent.
  - 8.3 4vCPU/32 GB RAM /1 TB Pay as you use basis DB Server
  - 8.4 Managed Services - OS, DB Management, Daily, Weekly, Monthly, bi-monthly, Half yearly, Yearly backups Shared Managed Firewall
  - 8.5 2 mbps uncapped bandwidth - Public IP Address x 2 (1 Required other one optional) - MPLS Cross connect Managed by AWS
  - 8.6 Backup Agent Per instance
  - 8.7 Storage management Per job
  - 8.8 Backup management Per instance
  - 8.9 Firewall management Per instance
  - 8.10 Advance Monitoring Per instance

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- 8.11 Port termination Per Port
- 8.12 Data Replication management Per Job Comes under Maintenance Architecture
- 8.13 Backup space Per TB Pay as you use basis
- 9. Designing & Implementation: -
- 10. As part of designing and implementation methodology, bidder needs to submit the details of
- 11. Provide technical solution design document of Primary Site DC.
- 12. VM's sizing methodology as per the application
- 13. Perform all system software installations and updates for software considered under this RFP.
- 14. High Availability solution at different level from Network, Physical nodes, VM's & Storage, having no single point of failure.
- 15. Proposed Solution should be compatible with IPv6 and High-level architectural diagram showing different layers of solution like Internet / MPLS Connectivity, Network, Security, Compute, Hardware, Storage & Backup layers.
- 16. Proposed solution should have IP schema depicted at high level with noting to secure the applications directly getting exposed to Internet. Bidder should propose to deploy different applications and database in different VLANs with restricting users to directly access database layer and storage layer
- 17. Backup solution with different features, like snapshots of VM's, online RDBMS backup, incremental and full back up of all data, restoration of data in test environment or as and when required.
- 18. Compliance sheet for the features mentioned in the following section for Cloud specifications.
- 19. Develop, maintain and update processing policies, procedures and documentation related to Primary Site DC & Secondary Site DR IT Infrastructure. Co-ordinate with the MNGL Team for process and procedures changes.
- 20. For remote monitoring and management bidder has to provide the internet link at Primary Site DC & Secondary Site DR.
- 21. Generate reports to ensure RTO & RPO are met as per the set timelines.
- 22. WAF Compliance
- 23. Server, Storage, Networking Devices, Security Devices, Operating System, Backup administration and day to day management & troubleshooting in case of any problem.
- 24. Complete monitoring and maintenance of DC & DR infrastructure, Cloud infrastructure, Network, security, storage & backup, etc.
- 25. Backup Solution: -
- 26. Bidder should propose for appropriate backup solution. Backup solution should be Disk to Tape or Disk to Disk type.



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27. Daily incremental backup should be taken and retention would be one week
28. Daily transactional log backup should be taken every 4 hours and retention would be one week.
29. Full back up for Weekly and monthly backup should be taken and retention period would be one week
30. Backup media to be stored in a safe environment so that whenever the backup is required to be restored for any purpose bidder should be able to restore the data. Appropriate Backup & restoration solution should be proposed considering this point.
31. Managed Services for Primary Site (DC) & Secondary Site (DR)
32. Server Administration & Management
33. Storage Administration & Management
34. Network & Security Management services
35. Backup/Restore Management for Servers, Database, Applications etc.
36. Configuration, administration, customization, upgrade/ patch/ new release deployment
37. BCP Planning and Disaster Management
38. Reporting & Documentation
39. Help Desk Management
40. Training, knowledge sharing and skills development for MNGL employees.
41. Public IP to be provided.
42. Half yearly archiving of entire data to be done automatically.
43. Back up of entire data for every 24 hours and to be maintained for at least a fortnight.
44. Bandwidth of at least 2 Mbps is required.
45. The control room will have a large LED screen display of the Web-Application, 2 operator stations, 1 engineering stations for changes/data modification and one historian to back up cloud database.
46. There should be provision for/ write access for certain compressor and dispenser parameters, which will be elaborated in the tender document.
47. All furniture will be in the scope of the vendor. Furniture includes Console Table for 6 personnel and 6 PC, Revolving executive Chair 6 numbers, white board etc. The list also includes and not limited to the standard furniture for control room used in contemporary city Gas Distribution companies.
48. Electricity supply will be provided by MNGL.
49. One viewing station will be provided in MNGL head office for monitoring.
50. Web-Application will have provision for incorporation of GIS network data.
51. Extensive redundancy for all data and web-application to be provided and switching time between servers must be fast enough to avoid loss of data in case of server failure.
52. MIS to be implemented, wherein graphical representation of all the data as per MNGL requirement will be displayed and emailed to authorized email addresses on daily basis.



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53. The bidder must provide one engineer and one technician for day-to-day monitoring and troubleshooting of the Automation project, both on field and Application end, during AMC period.
54. Agreement to be finalised and signed by the bidder and MNGL for non-use/non-transfer of source code handed over to MNGL to any third party.

#### **Key Deliverables:**

##### **Field Services and Infrastructure:**

Installation and commissioning of IOT gateways  
Compressors, Dispensers connectivity to IoT gateways at all the stations.  
Communication establishment between Dispensers, compressors to IOT's (Modbus).

##### **Software & Integration:**

All Specifications to be followed as per SRS document of MNGL

**Development and deployment:** Web application for real-time monitoring and control.


**Integration points:** Existing IoT system (AWS), ArcGIS, PoS (Point of Sale) and Payment Gateways.

**Data management:** 1 GB storage capacity in IoT gateways for data buffering. System designed to handle future expansion (at least 50% additional I/O points).

**Mobile Responsiveness:** The visualization platform shall be mobile-responsive and auto-adjust for mobile viewing.

The (Interactive)dashboard provides the following features:

- a) Dispenser utilization data and Sales Dashboard.
- b) Compressor predictive maintenance data
- c) Number of users per location per dispenser
- d) Live congestion monitoring, including vehicle(qty) and bay-wise breakdown.
- f) Business metrics including:
  - Serve time.
  - Cumulative count of vehicles served (bay-wise/type-wise)
  - Segregation of floating v/s captive traffic
  - Bay-wise utilization
  - Peak/Lean hours.
  - Sales and Cash Reconciliation using PoS data/Payment Gateway, shift wise and delivering the same to the respective CNG pump dealer through web responsive application. This is to help the dealers during shift wise cash reconciliation.

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- Camera based PoS machines to be provided for (stage -II) Automation project and the same shall be connected to the IoT for billing and printing purposes.

A comprehensive report detailing the extent and summary of congestion and transaction data collected at the station, along with key takeaways.

**API integration of existing outlets (already automated by MNGL) to provide a comprehensive dashboard for all sites including the Industrial sites automation app integration (API will be shared by MNGL).**

h) God view of stations, map visualizations across all metrics.

i) Identification of repeat customers through license plates, using camera based PoS machines/CCTV.

j) Automation features including:

- Shift-wise transactions.
- Dispenser parameters data
- Dispenser remotely shut off
- Price change arm wise with date & time stamp
- Compressor parameters
- Compressor alarms and alerts
- Compressor remote ON/OFF.
- Customer mobile bill receipt through PoS, Fleet customer data/filling details for dealer(backend)


**Analytics:** The platform shall provide analytics for:

- Estimated number of users per location/RO Wise
- Types of vehicles(qty) being serviced.
- Dispenser usage and load
- Unified performance and efficiency dashboard for decision-making
- Compressor runtime
- Additional Data analytics

**•Backup & Disaster Recovery:**

Cloud-based Backup & disaster recovery system with guaranteed availability and application backup.

- Instance level Backup
- Daily Incremental Backup
- Weekly Full Backup
- Backup to be maintain for last 30 Days

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- AWS/Azure Cloud Services –
  - Application Hosting should be on AWS/Azure Cloud.
  - Bidder should Create the Account on Behalf of MNGL & Share the Credentials after GO Live.
  - Software licensing (Operating System, Database Licensing, VM Licensing, etc. will be in the bidder's scope)
  - Bidder should provide the Cloud Services & should follow the guidelines be as per the Ministry of Information technology Govt. of India.
  - Bidder will be responsible to make the payment of Cloud Services during the contract period.
  - Bidder should arrange the Sizing of Cloud Storage, Server resources as per data & Users.
  - Manage Services of Cloud will be in the bidders Scope.

#### **4. Cybersecurity:**


- Secure communication protocols for data transmission
- Access control mechanisms for the web application
- Bidder Must submit ISO 27000 Certification
- Cybersecurity as per the NIST Guidelines
  - PCI DSS Compliance required.
  - VAPT Audit compliance
- **Warranty and Support:**
  - o Annual Maintenance Contract (AMC) for 5 years
  - o Providing 1x resident engineer and 2x local technician in Pune.

#### **MNGL Responsibilities:**

- o Centralized air conditioning

#### **6.Additional Notes:**

- MNGL will provide the 230V AC power supply at MCC, HO, and CNG stations.
- UPS supply at CNG stations will also be provided by MNGL.
- LUMPSUM HARDWARE AND SOFTWARE INSTALLATION BILLING

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SAP CODE TO BE CREATED AND THE SAME TO BE CONVEYED DURING PRE-BID.


#### Estimated bill of Material (Total)

FIELD RELATED BILL OF MATERIALS			
S.No.	Item	Quantity	UOM
1	IoT Gateway - Dual SIM Support, Inbuilt Diagnostics	300	Set
2	Cables		
2.01	3C X 1.5 Sq.mm Power Cable	6000	Metres
2.02	1P X 1.5 Sq.mm Signal Cable	17000	Metres
2.03	CAT6 Cable	15	Bundle
3	Cable Tray (FRP Type)		
3.01	50mm X 25mm X 2mm	3000	Metres
3.02	100mm X 25mm X 2mm	2670	Metres
4	Structural Steel for Mounting	0	Kgs
5	Ethernet Switch - 4 Port, 100 Mbps RJ45 ports (Optional)	150	Nos.
6	Power Supply for Gateway	150	Nos.
7	Firewall	0	Nos.
8	Panel for Mounting IoT Gateway and Power Supply	300	Nos.


CCR RELATED BILL OF MATERIALS			
S.No.	Item	Quantity	UOM
1	Engineering Station with Dual Monitor, Antivirus and MS Office,	1	No
2	Operator Station with Dual Monitor, Antivirus and MS Office, 27	2	Nos.
3	24 Port Ethernet Switch with 2 Nos. Fiber Port, SFP Module	1	No.
4	Prefabricated Engineering Consoles(Pyrotech)	3	Sets
5	Ergonomic Chairs (Pyrotech)	3	Nos.
6	UPS (7.5 kVA) with Ni-Cd Battery, 4 Hours back-up	1	Set
7	Firewall, 10 Port, 5 years Warranty	1	Nos.
8	A4 Printer Color	1	No.
9	A3 Printer	1	No.
10	Printer Table	2	Nos.
11	Power Distribution Cabinet (2100 mm X 800mm X 800 mm)	1	No.
12	Network Cabinet (2100 mm X 800mm X 800 mm)		No.

#### SOFTWARE RELATED BILL OF MATERIALS

.No.	Item	Quantity	UOM
1	One time Software Engineering	1	L
2	1 year of Comprehensive warranty	1	year
FIELD ENGINEERING & MANAGEMENT INCLUDING TRAVELS			

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S.No.	Item	Quantity	UOM
2	Installation & Commissioning of IOT Panel and other	1	Lumpsu
<b>AMC-PER YEAR AFTER 1 YEAR OF COMPREHENSIVE WARRANTY</b>			
S.No.	Item	Quantity	UOM
1	AMC Charges including	5	Year

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**Bidder Should Sign the NDA with MNGL Before Start of the Project. (Rs. 500/- legal Bond Paper)**

### **NON-DISCLOSURE UNDERTAKING**

**This Undertaking is being given on this -- day of ----- by and between**

Maharashtra Natural Gas Limited (MNGL hereinafter referred as “Disclosing Party”), a company registered under Companies Act, 1956 and having its registered office at Plot No. 27, A-Block, 1<sup>st</sup> floor, Narveer Tanajiwadi, P.M.T. Bus Depot, Commercial Bldg., Shivaji Nagar, Pune – 411005.

And

Contractor (hereinafter referred to as the “Recipient” who will act as a contractor), a M/s -----  
----- dated – -----


### **RECITALS**

WHEREAS, the Disclosing Party has agreed to provide certain information to the Receiving Party to enable the Contractor/Receiving Party to perform the contract including but not limited to information in relation to AWS Administrator Console, Software , Web application , AMC, SSL Certificate, FTP Server, Web Admin Console, Software Source Codes, Search Engine Optimization, DNS Admin Console, Payment Gateways, etc. and furnish a report to the Disclosing Party (hereinafter referred to as the Purpose”).


Pursuant thereto, the Receiving will receive certain strictly confidential or proprietary information in written or other tangible form, including, but not limited to, data, records, reports, correspondence, notes, electronically transmitted Information, documents and contract formats, and other information of/pertaining to the Disclosing Party, whether directly from the Disclosing Party and/or through its respective affiliates, consultants, trustees, advisors and management (the “Confidential Information”).

Any Confidential Information disclosed by the Disclosing Party and/or any of its respective affiliates, management, consultants, directors, advisors, or agents under this undertaking, irrespective of whether it is marked confidential or not shall be treated by the Receiving Party as confidential.

In consideration for the Disclosing Party agreeing to disclose the Information to Recipient, Recipient hereby undertakes and agrees as follows:

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1. Recipient undertakes that any information which the Disclosing Party discloses to Recipient, or to any officer, employee, authorized agent or other representative of the Recipient of any of its affiliates, in any tangible form which in any way is required for the Purpose shall be retained in strict confidence and shall not be disclosed or caused or permitted to be disclosed or discussed, published, reproduced or otherwise directly or indirectly to any third party without Disclosing Party's prior written approval and shall not be used by Recipient for any reason other than in relation to the Purpose.
2. Recipient agrees to use the Confidential Information solely for the Purpose.
3. Recipient agrees not make copies of the Confidential Information without the prior written request of the Disclosing Party, provided however that no such restriction shall apply in respect of making reasonable number of copies to fulfill the Purpose.
4. Recipient agrees to transmit the Confidential Information only to those of its own team members who specifically counter this agreement in token of their acceptance to the terms hereof being the employees of the Recipient entity working on the engagement and who need access to the Confidential Information for the Purpose and who are informed by Recipient of the confidential nature of the Confidential Information. Recipient further agrees to be responsible for any breach of this undertaking by Recipient or any of its own, officer, employee, or other representative of the Recipient.
5. Recipient agrees that all Confidential Information and documents disclosed to Recipient hereunder shall be and remains exclusive property of the Disclosing Party. Any tangible form of the Confidential Information covering documents, papers, computer diskettes and electronically transmitted Information shall (to the extent feasible), be destroyed by Recipient or returned together with all copies thereof to the Disclosing Party promptly upon its request. If such tangible form of the Confidential Information is destroyed, a certification of such destruction executed by a duly authorized officer of Recipient shall be delivered to the Disclosing Party.
6. Recipient's obligations under this undertaking shall continue for a period of completion of this engagement. Recipient agrees that no failure or delay on the Disclosing Party part in exercising any right, power or privilege under this undertaking shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or privilege preclude any other or further exercise thereof.
7. The Receiving Party shall indemnify the Disclosing Party for all costs, expenses, or damages that Disclosing Party incurs because of any violation of any provisions of this Agreement. This obligation shall include court, litigation expenses, and actual, reasonable attorney's fees. The Parties acknowledge that as damages may not be a sufficient remedy for any breach under this Agreement, the non-breaching party is entitled to seek specific performance or injunctive relief

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(as appropriate) as a remedy for any breach or threatened breach, in addition to any other remedies at law or in equity.

8. Any amendments, changes or modifications to this undertaking must be in writing and executed by authorized officials of both the parties to this undertaking.
7. This undertaking constitutes the entire agreement of the Recipient and the Disclosing Party with respect to the subject matter thereof and supersedes all prior understandings and agreements / undertaking between the Disclosing Party and the Recipient.
8. This agreement shall be governed by Laws of India and Court of Pune shall have exclusive jurisdiction.
9. It is understood that this undertaking is only for sharing of confidential information for stated purpose and does not obligate either party to enter into any further agreement, with respect to any matter arising out of or pertaining hereto.

IN WITNESS WHEREOF, the parties hereto have executed this undertaking to be effective as of the date first written above.

Maharashtra Natural Gas Limited  
By Disclosing Party

By Recipient Party

Name: -----

Name: -----

**Title:**


**Title:**

**WITNESS**

**1.**

**2.**



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### **3.4 Annual Maintenance Contract**

AUTOMATION vendor shall send technically trained & experienced service engineer to carry out Preventive maintenance / Breakdown Activities of the above system.

AUTOMATION vendor shall provide 2 nos. of Periodic Services at each site as per schedule offered during contract period. Duration of each service visit will be 2 working days.

AUTOMATION vendor shall provide Emergency/Breakdown Service on round the clock basis at each site as and when required during Warranty & AMC period.

AUTOMATION vendor shall depute service engineer as per MNGL schedule for schedule visit and within 4 hours after receipt of call for emergency call.

During periodic service call, Engineer shall carry out following jobs as a minimum. However he will carry out any other jobs which are necessary for the smooth and successful functioning of the system.

1. Checking & Testing of RTU Panels.
2. Checking & Testing of Communication devices.
3. Checking for General functionality.
4. General cleaning and maintenance of panels installed at various sites and MCC.
5. Attend the reported problems.


AUTOMATION vendor shall consider any kind of Mechanical, Civil and Electrical Work in their scope.

Any spares required for service / repairing /maintenance of RTU shall be in maintained by MNGL and same will be provided during engineer's visits. AUTOMATION vendor shall maintain the project back up and shall carry all necessary tool and tackles.

Rates are inclusive of TO & FRO travel, Lodging & Boarding and local conveyance charges of service engineer.

Engineer will follow all safety regulations and security rules.

In case of Emergency/Breakdown services successful AUTOMATION Vendor has to depute his Engineer to site within 4 hrs. Of intimation from MNGL.

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### **3.5 PENALTY CLAUSE**

#### **Complaint Response Time for AMC:**

1. On receiving information from the MNGL engineer, successful bidder shall ensure that his team reaches the concerned site within 4 Hours.
2. It is understood that successful bidder shall attend to any complaints within 4 hours Response Time, shall reach the site and start the rectification / repair work and to be completed within 24 hours.

#### **Payment Reduction Schedule (PRS):**

1. All complaints should be attended within 4 hours, failing which it would attract PRS (Payment Reduction Schedule) clause @ Rs.5,000/- per delayed complaint, beyond 4 hours.
2. Representative has reached site and if he is unable to resolve the complaint within 24 hrs, it would attract PRS @ Rs.10,000/- per day.
3. If System Availability is less than as mentioned in Tender it would attract PRS @ Rs.10,000/- per hour.

However total penalty amount shall not exceed 10% of Invoice Amount.

### **4 System Architecture and Design**

System Architecture design is aimed to providing end users to have uninterrupted access to Automation System over internet. City Gas Automation Project require IoTs or RTUs to be installed at various Gas facilities to prompt command to the Server system and vice versa. To make the Automation system more effect, the system should be architected intelligently to leverage effective solutions. The major parts of the Automation system would be as follows:

1. **Cloud Server System**
2. **RTUs/IIoT System**
3. **FTP Server System**
4. **Master Command Control Centre System**
5. **Web / Mobile Application System**

#### **4.1 Cloud Server System**

The enterprise Automation system will be built on the Cloud Infrastructure. All the security and Load balancing have been taken into the consideration at the design phase so the



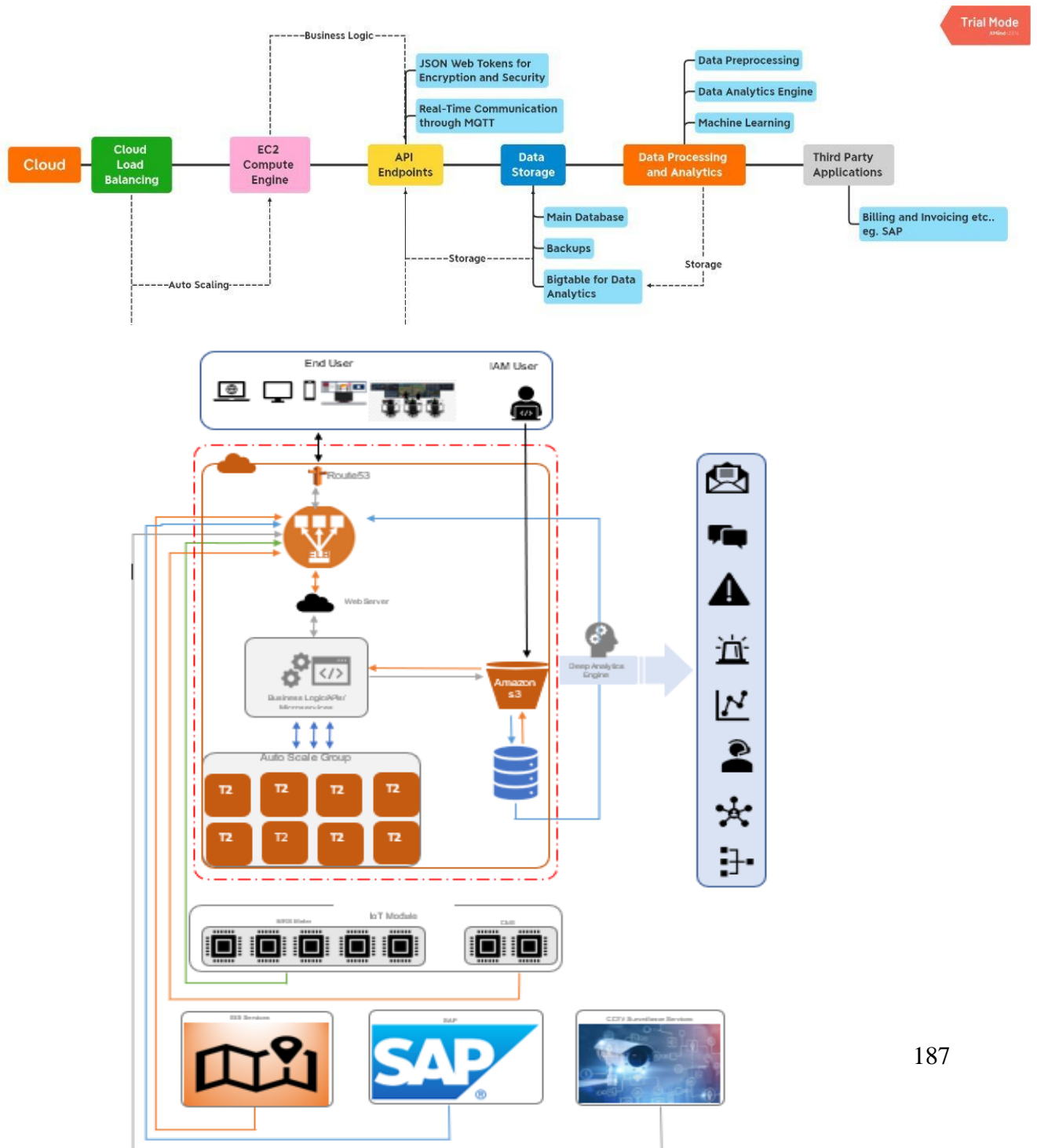
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application shall leverage serverless computing. Autoscaling provision has been made to scale up the infrastructure as on when required. AWS EC2 t2.xlarge server will be configured. The overall system architecture will provide the detailed information about the proposed Automation.

### System Architecture Design – Automation System



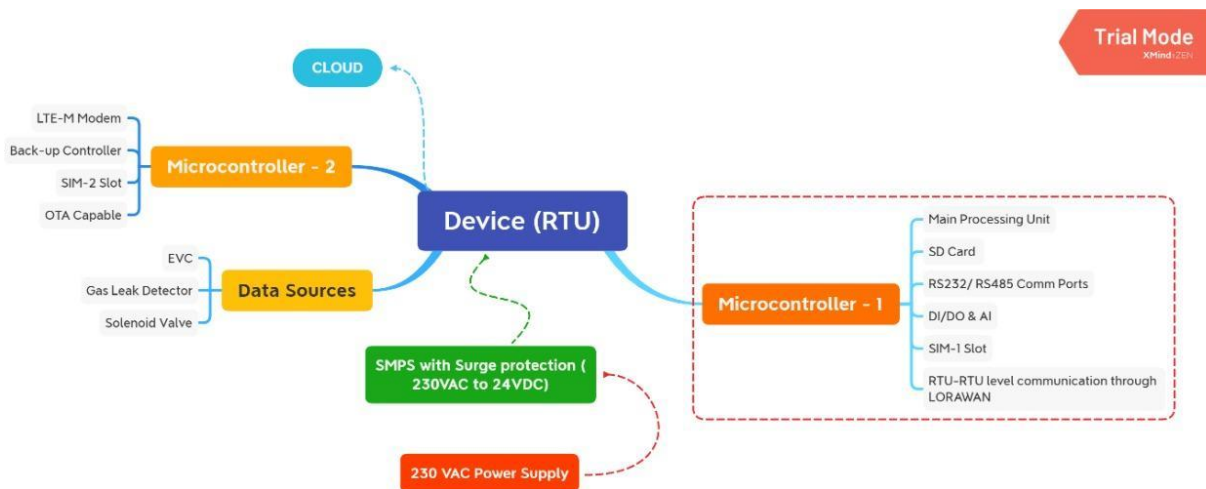
 <p><b>MAHARASHTRA NATURAL GAS LIMITED</b></p>	<p><b>Tender for automation of 300 CNG Stations, along with AMC for the period of 5 years in the GA's of Pune, Nashik, Sindhudurg, Ramanagara, Nanded and Nizamabad GA of MNGL</b></p> <p><b>Bid Doc. No. MNGL/CP/2025-26/35</b></p>
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AWS cloud server instances will be configured in the Mumbai Availability Zone with EC2 (t2.xlarge) instances. Required Security protocol will be followed for the Server system setup, Server will be protected under the firewall system for which the local IP should be ported to Public IP.

#### 4.2 RTUs/IloTs System


Supply, Installation & Commissioning of Remote Terminal Unit (RTU)

In this project Remote Terminal Units (RTUs) shall be installed at designated Gas facilities (CNG/MRS) to data communication to cloud server system. Data / Commands are to be communicated through JSON Web Tokens (JWT) protocol for secure transfer. The following picture illustrated the details architecture of the field automation system.



Automation system will be developed: -

- ✓ MNGL CNG activities runs on various business model such as CGS, MS, COCO, DODO, NRO, and OMC etc.
- ✓ CGS and MS are station where CNG gets supplied to heavy commercial vehicles like local buses & PMPML buses through dedicated dispensers.
- ✓ In other stations CNG gets supplied to Cars, Autorickshaw, Minibus and other CNG vehicles.
- ✓ CNG gets supplied through daughter booster station in the areas where pipelines are not laid.
- ✓ Industrial and Commercial customers are also get PNG through MRS.

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1. To connect all CNG & PNG (MRS) infrastructure with the Automation system, Agency will install Remote Terminal Units (RTUs) & RFID system.
2. Agency will supply & install all the equipment's as per the tender scope of supply.
3. Agency shall submit the RTUs Installation drawings before the installation activity for getting the necessary approval from the concerned station In charges via MNGL official
4. All the electrical fitting and wiring should be concealed, and Agency will take the at most safety measure at the time of installation.
5. Agency will hire expert engineer to execute the filed installation activity.
6. Post installation/Wiring Drawings should be submitted for each station after the successful commission

#### **4.3 FTP Server System**

- 4.3.1 Secure File Transfer Protocol (SFTP) will be set up for retrieving and transferring data from-to MNGL's existing systems.
- 4.3.2 Agency should develop a dedicated SFTP server for secure file transfer between Automation server and MNGL existing Server system.
- 4.3.3 Agency should maintain secure storage facility for file that gets transmit and retrieve from-to Automation Server system.
- 4.3.4 Agency should maintain separate database instances for FTP data.
- 4.3.5 Incremental and Periodic back up facility mechanism should be developed by the agency during the implementation.
- 4.3.6 Proper security must be configured for secure data transfer activities.
- 4.3.7 Dedicated storage location shall be allocated, may be separate S3 service should be configured for FTP server data.

#### **Configuration of Secure FTP (SFTP)**

- i. Create a folder where you can store batch files temporarily created during the table extraction process containing the information for which the details will be shared by MNGL.

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- ii. The SAP system must have full access to this newly created folder. Ensure that you have the <sid>adm user on Linux or SAPService<sid> user on Windows to have access to all SAP-related local resources.

*Note: Make sure that you are not interfering with any of the sensitive workflows in SAP server which is fully responsible for the business processes in MNGL.*

- iii. Co-ordinate with the SAP Admin to install a Network File Service (NFS) on the SAP server.
- iv. The folder you have previously created in step i. is released through the NFS for the FTP server to the SAP Admin to access the files.
- v. Define proper authorizations for the FTP user. Ensure that this user only has access to the newly created folder used for the batch file transfer with execute, read, and delete\* operations.

## 5 Design & Development of Database Schema for Automation System

Effective data management at the institutional level can support decision-making in resource management. The design of an effective data management system depends on several fundamental objectives, such as:

- ❖ To provide CGD standard data within a reasonable budget and also to provide consistent and acceptable documentation
- ❖ To facilitate easy access to data by resource managers and decision-makers
- ❖ To provide short-term and long-term security for data through archiving
- ❖ To provide computational support to the resource managers to analyse the collected data

Design can be optimized for parameters such as storage space, application convenience, access speed, or ease for conversion.


The database design defines a generic model for information. This generic model can be used to define and work with a wide variety of different user- or application-specific models. In this project, data are unstructured or semi structured data that transmits from the field through RTUs /IoT's. In this case NOSQL system used to operate the data.

### 5.1 Design of Database Services

Properly designed databases are easy to maintain, improves data consistency. The main objective of database designing is to produce logical model that concentrate on the data requirements and modelling. Database designing is crucial to a high-**performance** database system.

Details Methodologies for Database Design and its implementation

#### 1. Identification of Exact Project Requirement.

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Understanding project requirement is very much essential before designing database services. Since this project is being implemented on the cloud server and the data collects from gas facilities are unstructured, both S3 and DynaomaDB services will be utilised.

## 2. Design of Data Structure for project Database.

Data structure for read & write the item into the storage tables are to be designed once the RTUs system starts pingging the data. Agency will then finalise and data structure along with MNGL engineers. Keeping unwanted information lead unnecessary storage wastage.

## 3. Datasets / Tables

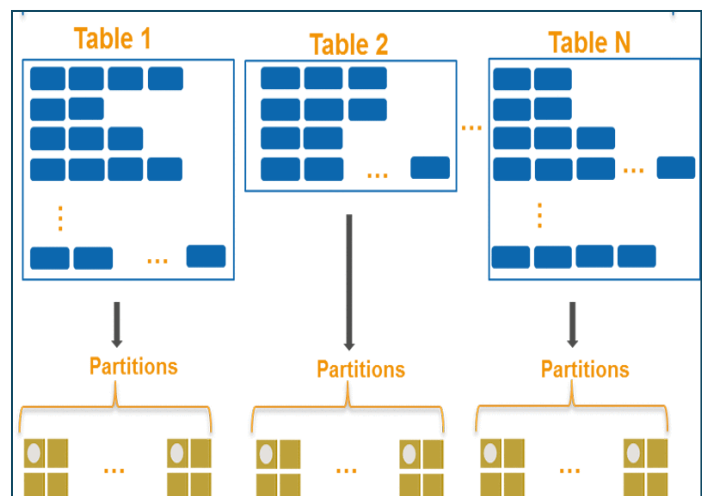
There are multiple sources of data as we have discussed in the above sections. Automation System will be receiving data from Gas sources like CNG Compressors, dispenser-RS485, MS\_Dispenser\_RFID, LCV\_FM etc.. So, tables will be configured in DyanomaDB services to putItem and readItem. Each table should have key value pair 'Hash Key' to uniquely identifying each item.

## 4. Design Documentation using Database Schema


To architect the Proposed database, Agency should design database schema using Unified Modelling Language (UML) which is schema stored for Item tables. Agency will submit the detail database design in UML schema by describing required relationship between related tables. Third party services information will be considered in the design. Agency will plot SAP and GIS data tables in the schema.

### 5.2 Development configuration of Database Services

There are many possible choices that can be made during the development and many rules to guide this work. When trying to decide if some choices are better than others, you need to consider the key desirable properties of a database. We list some of them below:



- **Completeness:** Ensures that users can access the data they want. Note that this includes ad hoc queries, which would not be explicitly given as part of a statement of data requirements.
- **Integrity:** Ensures that data is both consistent (no contradictory data) and correct (no invalid data), and ensures that users trust the database.

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- **Flexibility:** Ensures that a database can evolve (without requiring excessive effort) to satisfy changing user requirements.
- **Efficiency:** Ensures that users do not have unduly long response times when accessing data.
- **Usability** (ease of use): Ensures that data can be accessed and manipulated in ways which match user requirements.

MS Dispenser Table		
Item_ID	Make	Attribute
MSDISP001		Name:.....
		BP:.....
		EVC SER:....
		Devic:.....
		UNCOR.Vol....
		COR.Vol....
		COR.Fac....
		Date.Time..

CNG Dispenser Table		
Item_ID	Make	Attribute
DISP0003		Name:.....
		BP:.....
		Devic:.....
		UNCOR.Vol....
		COR.Fac....
		Date.Time..

Compressor Table		
Item_ID	Make	Attribute
GED001		Name:.....
		BP:.....
		HMR:....
		RPM:....
		Engine Oil Pressure....
		After cooler Temp
		Compressure Oil Temp
		Engine Oil Temp
		Engine Jacket wter Inlet Temp
		Engine jacker Water Outle Temp
		Engine Exhaust Gas Temp
		Aux Water Outlet Temp
		Comp Suction
		Comp Discharge
		Engine Flow
		LCV Flow


Compressor MED Table	
Item_ID	Attribute
MED0002	1st Stage Suction
	BVD
	2nd Stage Suction
	3rd Stage Suction
	Discharge Vol Bottle
	3rd Stage Discharge AC
	Gas discharge after filter
	compressor lube oil
	1st stage discharge
	2nd stage discharge
	3rd Stage Discharge
	3rd Stage Discharge AC
	Comp Lube oil
	Suction
	Discharge

1. By considering latency, performance, scalability and size of data planned, AWS DynamoDB services will be used as storage services.
2. *Amazon DynamoDB is a key-value and document database that delivers single-digit millisecond performance at any scale. It's a fully managed, multiregional, multimaster, durable database with built-in security, backup and restore, and in-memory caching for internet-scale applications. DynamoDB can handle more than 10 trillion requests per day and can support peaks of more than 20 million requests per second.*
3. The maximum item size in DynamoDB is 400 KB. So, in case of items bigger than 400KB then it is recommended to store part of the information on S3 and add an attribute, to reference the s3 item, to your DynamoDB entry. For concurrent updates you can use a conditional update or apply a counter.
4. Agency shall define read & write capacity for all the tables that will be captured by through put calculation.
5. Database could be administered using cloud watch to monitor the storage utilisation and traffic.

### 5.3 Backup and Restore

Automation system will be capturing data uninterruptedly from the gas facilities. Use of sophisticated RTUs / IoTs make the automation system to have robust database as the system will be receiving data continuously. In this project collected data should be stored and managed



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for long term periods, as the data will be analysed using machine learning technology. There would always a risk to have such large chunks of database without back and restore facilities. So, System should have backup and Restore mechanism on AWS DynamoDB and S3 Services. Data backup mechanism for this project have been mentioned bellow:

1. AWS DynamoDB offers fully automated on-demand backup, restore, and point-in-time recovery for data protection and archiving.
2. On-demand backup to be configured for full backups of Application Amazon DynamoDB table for data archiving.
3. Backups should be automatically encrypted, catalogued, easily discoverable, and retained until explicitly deleted.
4. Point-in-time recovery (PITR) provides continuous backups of the DynamoDB table data. When enabled, DynamoDB maintains incremental backups of application table for everyday basis until it explicitly turns it off.
5. Daily incremental backup should be taken, and retention would be one week.
6. Data gets replicated and versioned during the process, the incremental data should be managed with unique indexing on basis of datetime stamp.
7. Daily transactional log backup should be taken every 4 hours and retention would be one week.
8. Full back up for Weekly and monthly backup should be taken and retention period would be one week.
9. Backup media to be stored in a safe environment so that whenever the backup is required to be restored for any purpose bidder should be able to restore the data.
10. Appropriate Backup & restoration solution should be proposed considering this point. S3 services may be used for backup for long term data.

#### 5.4 Maintenance Phase

Maintenance of the database is a key issue on a large-scale project of this size. Maintenance can take the following main forms:

1. **Operational maintenance**, where the performance of the database is monitored. If it falls below some acceptable standard, then reorganisation of the database, usually in the form of adjustments to the storage schema, takes place to ensure that performance is maintained at an acceptable level.
2. **Porting and implementation maintenance**, in which the DBMS, the user processes, the underlying computer system or some other aspect undergoes changes that require the database implementation to be revised. Of course, the extreme form of porting occurs when

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the database is to be entirely replaced – in which case the entire development life cycle is usually followed using the existing database and its limitations as the starting point for requirements analysis. Adjustments to the storage schema are almost inevitable as new data storage capabilities become available. This can involve both restructuring and reorganisation, depending on the scope of the changes taking place. This architecture approach we would hope to minimise the impact of change and build systems which are easily maintained.

## **6 Design, Development and Commissioning of Automation System**

### **6.1 Application Development (Web/Mobile/API)**

#### **6.1.1 Design & Development of User Interface / User Experience for proposed Web and Mobile Application**


- **End User UI** - allows users to communicate and interact with MNGL applications, analytics results, etc. This also includes internal or customer facing mobile user interfaces.
- **Administrator UI** - enables administrators to access metrics, operation data, remote control and various logs.
- **MCCC UI** – Dedicated integrated UI should be designed & developed for Master Command Control Centre for Populating Gas Consumption Dashboard, Machine Monitoring Console, GIS Console, CCTV feeds etc.
- **Mobile UI** – A UI / UX designed for mobile application with required functionality.

Agency should design User Interface for the application and submit the wireframe to MNGL for necessary approval. Only After MNGL approval the Agency should start developing the application with desired functionality.

#### **6.1.2 Development of various Modules of Automation System**

- RTU
- Ingestion
- Core MQTT
- Data Analytics
- Machine Learning
- Data Storage
- Web Application
- Mobile Application

#### **6.1.3 Integrated Dashboard Master Command Control Centre Module**

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A command-and-control centre are a secure room in a facility that provides centralized monitoring, control and command of a situation. This command-and-control centre allow users to view various real-time statistics from devices, about assets and reports. Various software modules of the Automation System will be integrated using direct feeds, dashboards and sharing of alerts/actionable inputs for integrate and view operations, such as:

1. GIS based assets dashboard
2. Gas Consumption Pattern Monitoring
3. Smart monitoring of Compressor, MRS & DRS
4. Monitoring of Ultra Sonic Flow Meter (USM) information.
5. Emergency Response Module
6. GIS Modules
7. SMART Health Monitoring of Field IoTs/RTUs
8. Smart Health Monitoring of Gas Station & Skids
9. Integration of Tracking & Monitoring of LCV Application
10. CCTV Surveillance

#### 6.1.4 User Management Module


Roles define a set of permissions that users of MNGL may have within the MNGL Application. This is also called role-based access control, or RBAC.

##### Predefined Roles

The Application includes predefined roles for the **Administrators** and the **Analysts** (read-only) users. However, you might need to create new roles if required by MNGL.

##### **Administrator**

- Can view and modify components that change the state of the devices, business transactions, values in the dashboards, and so on.
- Can add or edit users, devices, industries/stations and the authentication rules. This role has all the account-level permissions.
- Can view/manage business flows, view and configure scheduled reports and so on.
- Have full access to all platform features enabled for an organization.
- Manage billing cycles for a station/industry e.g. Approve Meter readings data collected by Automation system after verification with field personnel on daily basis before updating on the FTP server
- Administrator should be able to control operation of Compressors, MRS and DRS through command from the Engineering console
- Can access/define other User-level settings

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## 1. Analyst


- Permissions for read-only actions that do not affect state, such as viewing (but not modifying) existing resources or data from devices.
- Analyst users should have access to historic data of Gas Consumption
- Analyst user group should require functionality to analyse the Gas Consumption on the Web and Mobile application.
- Can view the change the state of the devices, values in the dashboards, and so on.
- Can view scheduled reports and business flows.
- Can escalate/report anomalies if need to the admin or take required action.

## 2. User

- Users' groups should be configured to view the application.
- User group should have access to all the modules of Automation system with read only privileges
- Can view the change the state of the devices, values in the dashboards, and so on.
- Can view scheduled reports and business flows.
- Can escalate/report anomalies if need to the admin or take required action.

### 6.1.5 Gas Consumption

1. The system should capture meter reading information from PLC and EVC respectively through RTUs/IoT.
2. Information should be transmitted via CoAP protocol for faster performance in every 5 minutes interval.
3. System should retrieve the Gas consumption data for the Gas Stations (CNG, MRS & DRS) and populate it on the User Interface in tabular form.
4. Gas consumption data should be refreshed with the latest feeds on real-time basis which also should be reflected on the User interface.
5. System should also populate the historic gas consumption data for last 30 days in both tables and Chart form
6. System should be able to display the total Gas intake (USM feed) vs. total sales figure including I/C, domestic, commercial, Industrial and CNG. Thereby indicating total loss figures.

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7. System should have provision for manual input of certain parameters like Open/Closing stock, which can be considered by the application while calculating loss figure.
8. Gas Consumption data module should be linked with GIS Module for rendering data on GIS console. Agency should do all the necessary integration and customisation.
9. Mouse hovering functionality should be provided so that user can view the Gas sale data as on user mouse hover the Gas station on the GIS console.
10. This particular module should be developed for both web and Mobile platform with secure log in privilege.

#### 6.1.6 Smart Monitoring

1. System should display the face plate with all critical parameter along with alarm for the trip set points.
2. System should display the critical parameters / face plate on real time basis of CNG Compressor and MRS with their high low range in different colour code for easy recognition.
3. Automation system should alert with alarm buzzer in case of critical parameter crosses its defined range. MNGL will define alarm trip set points during commissioning stage.
4. Automation system should populate the IoTs / RTUs working status on real-time basis. In case of failure system should highlight the RTUs on the User Interface.
5. System should also display Network signal strength of RTUs / IoTs.
6. Daily gas sale report for PMPML buses should be generated.
7. Automation system should have the facility to log the trend of all critical parameter to facilitate the root cause analysis.
8. Monitoring of RTUs health and Signal strength functionality should be developed.
9. RTUs should be auto diagnosed and debugged at certain interval to avoid unnecessary failure.
10. In case of RTUs failure or signal loss the automation system should alert the operator.

#### 6.1.7 Emergency Response System

1. System should capture Incident reported on the GIS System and trace the downstream facilities like CNG, MRS and DRS.
2. Automation system should populate the affected gas facilities to the Administrator for necessary action.
3. Administrator should have full access to Emergency Response Module to command control gas facilities as per the requirement.

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4. Automation system to communicate (SMS & Email) the location in case of incident or Gas Leak to the MNGL's concerned authority.
5. Automation system should store the Gas leak data in cloud server for analysing the future gas leak under Predictive Analytics
6. Automation system should be customised functionality to shutting down the affected CNG/MRS etc.

#### 6.1.8 Analytics


Analytics is at the heart of a robust IIoT application, and understanding different types of analytics and utilizing the appropriate technology is essential for the success of developing an IIoT application. There are different types of analytics that can be developed for IIoT applications, all the way from a simple threshold analytic to streaming analytics using Kafka, Spark, and NoSQL stores like DynamoDB, as given as follows.

Automation system will be receiving ample of data from the field RTUs on frequently interval. These big chunks of information should be stored for future analysis using Machine learning technology to forecasting gas consumption and machine failure.

Agency should be developed Analytics module to analyse the current as well as historic data to get future prediction.

#### A. Descriptive Analytics - Insight into Device Health


1. Automation system should monitor and manage the health of the machines. The system should show the machine health in appropriate colour signal.
2. Automation system should calculate compressor capacity utilisation and alert the in case of over utilisation on daily sale basis.
3. Automation system should be analysing the dispenser performance on real-time basis based on the dispensing capacity. System should bring the abnormality to concerned engineers notice as when it occurs.

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4. System should analyse the flow meter data to cater the Gas consumption data and trip details that LCV does.
5. USM data like Gas Composition, Gas Flow volume, Gas Velocity etc. data should be analysed, and the required parameter should be used to invoice the CNG and Industrial customer.
6. System should keep tracking the System load and capacity utilisation of MRS & DRS from the live feed data from RTUs/IloTs and notify the necessary action.
7. Gas Sales pattern and Trend Analysis of CNG, MRS, DRS on daily basis and identify the classify the stations on their sales pattern (top ten best sale station and to ten low sales station).
8. Automation system should be able to do the gas Loss calculation and Loss Posting on daily basis from the data received from the field through RTUs.
9. System should generate the Daily progress report on total gas purchase and sales sheet and share the DPR on mail at the end of the day.
10. Automation should be analysing the gas sale at Daughter booster station and notify the concern engineer for LCV filling in advance I order to avoid dry out situation.

**B. Predictive Analytics - Understanding the future failure modes of the device**

1. The system should predict about future maintenance requirement / break down of all equipment's based on current usage and diagnostic parameter.
2. Automation system should alert the necessary preventive maintenance in advance by analysing historic critical parameter data of machine (Compressor and RPD Flow Meter and Stationary Skid).


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3. Automation System should be able to predict future gas requirement by analysing the historic gas consumption pattern and economic situation of market.
4. System should predict the future Gas demand on station wise by analysing sales pattern and current infrastructure.
5. System should recommend increasing and decreasing the number of infrastructure (Compressor, Dispensers, MRS & DRS etc.) by analysing the gas load from the historic database.
6. Flow Meter Data Analysis should be carried by system to recommend conversion of DBS to Online station.
7. System should analyse the open-source data like Population growth, Vehicle Registration, Industrialisation for last decades and predict the CNG station and MRS/DRS required to serve customer.
8. System should predict to upgrade the capacity MRS & DRS by analysing historic capacity utilisation and Sale Pattern.
9. System should analyse the critical parameter data over time and predict the future maintenance at the MRS to avoid the unexpected system failure
10. System should analyse the historic Gas leak event at the MRS and suggest the necessary action in advance.

#### 6.1.9 Reporting

1. CNG Sale Report
2. Gas Consumption Report
3. PMPML Gas Consumption Report
4. Gas Consumption Report for Industrial



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5. Gas Consumption Report for Domestic (Commercial)
6. Energy consumption Reports
7. Daily Progress Report
8. Daily Report of USM data like Gas Composition, Gas Flow volume, Gas Velocity etc.
9. LCV Tripping Report
10. Network Usage report for all the RTUs / IloTs

#### 6.1.10 Sap Integration


1. The vendor must design an FTP server to collect data from the Web-Application in a pre-defined format so as to interface with SAP to process the billing for individual CNG station.
2. The bills for each CNG station to be generated on a fortnightly/monthly basis and must be mailed to the respective customers as well as MNGL.
3. This will be in the scope of SAP vendor, but the data must be transmitted to the FTP server by the Web-Application.
4. The data that will be pushed by the RTU to Web-Application must have an intermediate stage where-in the operator at the control room can validate the data before the data is pushed to FTP server, for billing. Without operator validation the Web-Application will not push the data into the FTP server.

#### 6.1.11 GIS Integration

1. GIS Services like Assets Dashboard, Outage Management and Emergency Response System should be integrated in the Automation system to provide early response system.
2. Gas Leak Analysis Modules should be integrated to provide Gas leak information.
3. Outage management modules integration helps operator to trace the downstream consumers including CNG, MRS & Commercial.
4. Cathodic Protection Management system should also be integrated with Automation system to Steel Pipeline status.
5. GIS dashboard Gas Sale data (CNG, MRS, DRS) which should be dynamically updated based the real-time feeds from RTUs.

#### 6.1.12 CCTV Integration (Phase-II)

1. Integration for CCTV Application to display in the Master Command Centre in the web application.
2. System should show individual system's CCTV footage as on when required.
3. System should be analysing the CCTV footage to get the station que data.

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#### 6.1.13 LCV Tracking and Monitoring Service Integration

1. Agency should integrate the LCV tracking application with the Automation system.
2. System should show the live tracking of LCV trucks and ERVs on the Master Command Control Centre (MCCC).
3. Automation system should alert as when the LCV and ERVs stop tracking.
4. Automation should send and receive message to LCV and ERV as on when it is required.
5. In case dry out situation, Automation System should be able to send message to LCV operator to divert the running LCV to dried out station.

#### 6.1.14 Mobile Application Development

1. Mobile Application should be developed in both Android and IOS platform to view the Gas consumption data on real-time basis.
2. Mobile application should be able to show the critical parameter on real-time basis.
3. .
4. User should be able to view the station wise Gas consumption on the mobile console.
5. User should query the Station (CNG, MRS & DRS) for viewing current and historic gas sale data.
6. Monitoring of RTUs health and Signa strength functionality should be developed on the mobile Platform.

#### 6.1.15 System Testing


System Testing is a level of testing that validates the complete and fully integrated software product. The purpose of a system test is to evaluate the end-to-end system specifications. System Testing is actually a series of different tests whose sole purpose is to exercise the full computer-based system.

#### 6.1.16 Unit Testing

Unit Testing is a type of software testing where individual units or components of a software are tested. The purpose is to validate that each unit of the software code performs as expected. Unit Testing is done during the development phase of an application by the Agency.

#### 6.1.17 Sandbox Testing

A sandbox is a testing environment that isolates untested code changes and outright experimentation from the production environment in the context of software development including Web development and device firmware development. Provide a sandbox environment to MNGL to test/control a station/industry with all the desired functionalities before deploying/scaling the product to all the stations/industries.

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#### 6.1.18 User Acceptance Testing

User Acceptance Testing (UAT) is a type of testing performed by MNGL to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing are done.

### 6.2 System Deployment

Cloud environments offer tremendous flexibility with less concern for how components are physically connected. The need for advanced planning is reduced but still important. This section offers suggestions for better provisioning of data and computing resources. Initial Criteria


- Scalability & Elasticity
- Data Bandwidth
- Data Sovereignty
- Resilience
- CPU and Computation
- Data Volume
- Security

### 6.3 Training

AUTOMATION Vendor shall provide training to the COMPANY of the entire system for technical, maintenance and operator personnel. COMPANY will bear the expenditure pertaining to travelling expenses, daily allowance, hotel expenditure and local conveyance for Company's personnel for attending the training. Further details are given in the tender document.

### 6.4 Annual Maintenance Contract


1. AUTOMATION vendor shall send technically trained & experienced service engineer to carry out Preventive maintenance / Breakdown Activities of the above system.
2. AUTOMATION vendor shall provide 2 nos. of Periodic Services at each site as per schedule offered during contract period. Duration of each service visit will be 2 working days.
3. AUTOMATION vendor shall provide Emergency/Breakdown Service on round the clock basis at each site as and when required during Warranty & AMC period.

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4. AUTOMATION vendor shall depute service engineer as per MNGL schedule for schedule visit and within 4 hours after receipt of call for emergency call.
5. During periodic service call, Engineer shall carry out following jobs as a minimum. However, he will carry out any other jobs which are necessary for the smooth and successful functioning of the system.
  1. Checking & Testing of RTU Panels.
  2. Checking & Testing of Communication devices.
  3. Checking for General functionality.
  4. General cleaning and maintenance of panels installed at various sites and MCC.
  5. Attend the reported problems.
6. AUTOMATION vendor shall consider any kind of Mechanical, Civil and Electrical Work in their scope.
7. Any spares required for service / repairing /maintenance of RTU shall be in maintained by MNGL and same will be provided during engineer's visits. AUTOMATION vendor shall maintain the project back up and shall carry all necessary tool and tackles.
8. Rates are inclusive of TO & FRO travel, Lodging & Boarding and local conveyance charges of service engineer.
9. Engineer will follow all safety regulations and security rules.
10. In case of Emergency/Breakdown services AUTOMATION Vendor must depute his Engineer to site within 4 hrs. Of intimation from MNGL.

#### **6.5 Submission of Report and Project Deliverables**

1. Supply of few SOR Items as mentioned in the Purchase Order to be done in 4 months from the date of receiving the work order.
2. Detailed System Architecture for each location/site.
3. Detailed BOM per site with Make and Model number of each Hardware
4. Communication Media /telemetry architecture and BOM for each site and overall, along with bandwidth calculations.
5. Power consumption details with UPS/battery backup calculations correlating with offered UPS/battery backup system.
6. Communication Details for each Hardware.
7. Communication Media Details with feasibility survey report.
8. Compliance of Hardware and Software.
9. System Description

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10. Check List
11. Project Completion Schedule along with application design wire frame report.
12. Organization Details (Location, Manpower, Nature of Business etc.)
13. RTUs installation drawing for each station
14. Supply and Installation and commission Report of Command Control Centre
15. Supply, Installation and Commissioning Report of RTUs and IloTs
16. System Requirement Specification (SRS) Report
17. Application Wireframe design Report
18. Cloud server specification Report.
19. Installation and commissioning of Automation System- Go live Certificate
20. Source Code for Web and Mobile Application.
21. Functionality Acceptance Test (FAT) Report
22. System Acceptance Test (SAT) Report
23. Reference List along with Completion Certificate
24. AMC period will be from the 5 years from the date of completion of warranty period of 1 year.
25. AMC Reports as per scope defined in AMC.

#### **6.6 Licensing Requirements**


Not Applicable

#### **6.7 Legal Copyright and other Notice**

Automation System should display the disclaimers, copyright, word mark, trademark and product warranties of the MNGL Automation System. Automation System will be the proprietary product of MNGL will exclusive copyrights.

#### **6.8 Applicable Standard**

It shall be as per the industry standard.


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## SECTION-VII

### UNPRICED SCHEDULE OF RATES

**Schedule of Rates (SOR) / BOQ is enclosed separately on e-tendering portal. following the unpriced schedule of rates to be submitted along with the Technical Bid duly filled in quoted / not quoted:**

Sl. No.	Item Description	Unit	Total Quantity
1	<b>Supply &amp; Delivery of Materials Comprising of Supply, I&amp;C of:</b> IoT Gateway - Dual SIM Support, Inbuilt Diagnostics (Unit-Set) 3C X 1.5 Sq.mm Power Cable (Unit-Meter) 1P X 1.5 Sq.mm Signal Cable (Unit-Metres) CAT6 Cable (Unit-Bundle) Cable Tray (Unit-FRP Type) PoS Machine (as per scope) 50mm X 25mm X 2mm (Unit-Meter) 100mm X 25mm X 2mm (Unit-Meter) Ethernet Switch - 4 Port, 100 Mbps RJ45 ports (Optional) (Unit-Nos) Power Supply for Gateway (Unit-Nos) Panel for Mounting IoT Gateway and Power Supply (Unit-Nos) All work & supply to be done as per scope of work	No	300
2	<b>Command &amp; Control Centre Bill of Materials Comprising of Supply, I&amp;C of:</b> <ul style="list-style-type: none"> <li>Engineering Station with Dual Monitor, Antivirus and MS Office, 27 Inch monitor (1 no)</li> <li>Operator Station with Dual Monitor, Antivirus and MS Office, 27 Inch monitor (-2 no)</li> <li>24 Port Ethernet Switch with 2 Nos. Fiber Port, SFP Module included (1 No)</li> <li>Prefabricated Engineering Consoles (Pyrotech make) (3-Set)</li> <li>Ergonomic Chairs (Pyrotech make) (3 Nos)</li> <li>UPS (7.5 kVA) with Ni-Cd Battery, 4 Hours back-up (1-Set)</li> <li>Firewall, 10 Port, 5 years Warranty (1 no)</li> </ul>	Nos	1

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	<ul style="list-style-type: none"> <li>• A4 Printer Color (1 nos)</li> <li>• A3 Printer (1 no)</li> <li>• Printer Table (2 No)</li> <li>• Power Distribution Cabinet (2100 mm X 800mm X 800 mm) (1 No)</li> <li>• Network Cabinet (2100 mm X 800mm X 800 mm) (1 No)</li> </ul> All work & supply to be done as per scope of work		
<b>03</b>	<b>Software Engineering and licenses</b>  <b>One time Software Engineering (1 lot)</b> <b>1 year of Comprehensive warranty</b> All work & supply to be done as per scope of work	<b>1</b>	<b>Nos.</b>
<b>04</b>	<b>Field Engineering, management &amp; travels</b>  <b>(Installation &amp; Commissioning of IOT Panel and other Miscellaneous Items at Site)</b> All work & supply to be done as per scope of work	<b>300</b>	<b>Nos.</b>
<b>05</b>	<b>Comprehensive Annual Maintenance Contract (CAMC)</b> - with 1 no Resident Engineer and 2 nos Technician <b>(Cloud Charges, WebApp Maintenance Charges &amp; Manpower Charges)</b> All work & supply to be done as per scope of work	<b>60</b>	<b>Months</b>

Notes:

1. All SOR item shall be quoted by the bidder in the price part of the bid in, otherwise bid will be rejected
2. Prices quoted shall be inclusive of all taxes/duties and nothing extra shall be payable by the owner except for statutory variation in Goods & service tax rate during the contractual period. **Bidder shall note that any error in estimating these taxes & Duties (GST) will be to Bidder's Account**

Seal & Signature of Bidder

