Bid Number: GEM/2022/B/1996656
Dated: 01-03-2022

Bid Document

Bid Details	
Bid End Date/Time	30-03-2022 11:00:00
Bid Opening Date/Time	30-03-2022 11:30:00
Bid Life Cycle (From Publish Date)	90 (Days)
Bid Offer Validity (From End Date)	60 (Days)
Ministry/State Name	Ministry Of Petroleum And Natural Gas
Department Name	Oil India Limited
Organisation Name	Oil India Limited
Office Name	Oil India Limited
Total Quantity	3
Item Category	Gas Compressor Control Panels (Q3)
MSE Exemption for Years of Experience and Turnover	No
Startup Exemption for Years of Experience and Turnover	No
Document required from seller	Certificate (Requested in ATC),OEM Authorization Certificate,Additional Doc 1 (Requested in ATC),Additional Doc 2 (Requested in ATC),Additional Doc 3 (Requested in ATC),Additional Doc 4 (Requested in ATC) *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
Bid to RA enabled	No
Time allowed for Technical Clarifications during technical evaluation	5 Days
Inspection Required (By Empanelled Inspection Authority / Agencies pre-registered with GeM)	Yes
Inspection to be carried out by Buyers own empanelled agency	Yes
Type Of Inspection	Pre Dispatch
Name of the Empanelled Inspection Agency/ Authority	Board of Officers
Evaluation Method	Total value wise evaluation

EMD Detail

Required	No

ePBG Detail

Advisory Bank	HDFC Bank
ePBG Percentage(%)	3.00
Duration of ePBG required (Months).	20

(a). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable.

Beneficiary:
GM-FA
Oil India Limited, Duliajan Assam - 786602 Ph: 0374 2808705 (Direct). Details of Beneficiary : OIL INDIA LIMITED Bank Name :HDFC BANK LIMITED Branch Name :Duliajan Bank Account No. :21182320000016 Type of Account :Current Account IFSC Code :HDFC0002118 MICR Code:786240302 SWIFT Code :HDFCINBBCAL NOTE: THE BANK GUARANTEE ISSUED BY THE BANK MUST BE ROUTED THROUGH SFMS PLATFORM AS PER FOLLOWING DETAILS: a. (I)"MT 760 /MT760COV FOR ISSUANCE OF BANK GUARANTEE (ii) “MT 760 / MT 767 COV FOR AMENDMENT OF BANK GUARANTEE THE ABOVE MESSAGE / INTIMATION SHALL BE SENT THROUGH SFMS BY THE BG ISSUING BANK BRANCH TO HDFC BANK, DULIAJAN BRANCH, IFS CODE – HDFC0002118; SWIFT CODE - HDFCINBBCAL. BRANCHADDRESS: HDFC BANK LIMITED, DULIAJAN BRANCH, UTOPIA COMPLEX, BOC GATE, JAYANAGAR, DULIAJAN, DIBRUGARH, PIN – 786602." b. THE SUPPLIERSHALL SUBMIT TO OIL THE COPY OF SFMS MESSAGE AS SENT BY THE ISSUING BANK BRANCH ALONG WITH THE ORIGINAL BANK GUARANTEE. Contact person: Tushar Ranjan Dutta, Manager Materials, Ph: 03742808705.
(Gm-fa)

Splitting

Bid splitting not applied.

MII Purchase Preference

MII Purchase Preference	Yes

MSE Purchase Preference

MSE Purchase Preference	Yes

1. Preference to Make In India products (For bids < 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.
2. Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued

by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% (Selected by Buyer)of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 100%(selected by Buyer) percentage of total QUANTITY.

3. **Inspection of Stores by Nominated Inspection Authority / Agency of buyer or their authorized representatives**

An independent third party Professional Inspection Body can help buyer in mitigating buyer's risk with pre-dispatch/post-dispatch inspection in order to ensure that equipment, components, solutions and documentation conform to contractual requirements. The buyer has a right to inspect goods in reasonable manner and within reasonable time at any reasonable place as indicated in contract. Inspection Fee/ Charges (as pre-greed between buyer and Inspection Agency) would be borne by the buyer as per their internal arrangement but may be recovered from the seller if the consignment failed to conform to contractual specification and got rejected by the Inspection Officer .If so requested and accepted by the seller , initially seller may pay for inspection charges as applicable and get the same reimbursed from buyer if consignment accepted by the Inspecting Officer . For reimbursement seller has to submit proof of payment to Inspection Agency.

Seller/OEM shall send a notice in writing / e-mail to the Inspecting officer / inspection agency specifying the place of inspection as per contract and the Inspecting officer shall on receipt of such notice notify to the seller the date and time when the stores would be inspected. The seller shall, at his own expenses, afford to the Inspecting officer, all reasonable facilities as may be necessary for satisfying himself that the stores are being and or have been manufactured in accordance with the technical particulars governing the supply. The decision of the purchaser representative /inspection authority regarding acceptance / rejection of consignment shall be final and binding on the seller.

The Seller shall provide, without any extra charge, all materials, tools, labour and assistance of every kind which the Inspecting officer may demand of him for any test, and examination, other than special or independent test, which he shall require to be made on the seller's premises and the seller shall bear and pay all costs attendant thereon.

The seller shall also provide and deliver store / sample from consignment under inspection free of charge at any such place other than his premises as the Inspecting officer may specify for acceptance tests for which seller/OEM does not have the facilities or for special/ independent tests.

In the event of rejection of stores or any part thereof by the Inspecting officer basis testing outside owing to lack of test facility at sellers premises, the seller shall, on demand, pay to the buyer the costs incurred in the inspection and/or test. Cost of test shall be assessed at the rate charged by the Laboratory to private persons for similar work.

Inspector shall have the right to put all the stores or materials forming part of the same or any part thereof to such tests as he may like fit and proper as per QAP/governing specification. The seller shall not be entitled to object on any ground whatsoever to the method of testing adopted by the Inspecting officer.

Unless otherwise provided for in the contract, the quantity of the stores or materials expended in test will be borne by seller.

Inspecting officer is the Final Authority to Certify Performance / accept the consignment. The Inspecting officer's decision as regards the rejection shall be final and binding on the seller.

The seller shall if so required at his own expense shall mark or permit the Inspecting officer to mark all the approved stores with a recognised Government or purchaser's mark.

Pre Bid Detail(s)

Pre-Bid Date and Time	Pre-Bid Venue
15-03-2022 09:00:00	Through Video Conference. Bidder must submit their queries atleast 3 days prior to the pre-bid interaction date to mail id: tushar_dutta@oilindia.in

Gas Compressor Control Panels (3 pieces)

(Minimum 50% Local content required for qualifying as Class 1 Local Supplier)

Brand Type	Unbranded

Technical Specifications

Buyer Specification Document	Download

Installation Commissioning and Testing (ICT) details for the above item:

% of Product Cost Payable on Product Delivery	80%
Min Cost Allocation for ICT as a % of product cost	1%
Number of days allowed for ICT after site readiness communication to seller	90 Days

Consignees/Reporting Officer and Quantity

S.No.	Consignee/Reporting Officer	Address	Quantity	Delivery Days
1	Krishna Mohan Kumar	786602,Oil India Limited, Duliajan, Assam	3	270

Buyer added Bid Specific Additional Scope of Work

S.No.	Document Title	Description	Applicable i.r.o. Items
1	Tender document View	Tender document	Gas Compressor Control Panels(3)

The uploaded document only contains Buyer specific Additional Scope of Work and / or Drawings for the bid items added with due approval of Buyer's competent authority. Buyer has certified that these additional scope and drawings are generalized and would not lead to any restrictive bidding.

Buyer Added Bid Specific Terms and Conditions

1. **Scope of Supply**

Scope of supply (Bid price to include all cost components) : Supply Installation Testing and Commissioning of Goods

2. **Generic**

   Bidder financial standing: The bidder should not be under liquidation, court receivership or similar proceedings, should not be bankrupt. Bidder to upload undertaking to this effect with bid.

3. **Generic**

   Bidder shall submit the following documents along with their bid for Vendor Code Creation:

   a. Copy of PAN Card.

   b. Copy of GSTIN.

   c. Copy of Cancelled Cheque.

   d. Copy of EFT Mandate duly certified by Bank.

4. **Certificates**

   Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

5. **Warranty**

   Warranty period of the supplied products shall be as given in specifications from the date of final acceptance of goods or after completion of installation, commissioning & testing of goods (if included in the scope of supply), at consignee location. OEM Warranty certificates must be submitted by Successful Bidder at the time of delivery of Goods. The seller should guarantee the rectification of goods in case of any break down during the guarantee period. Seller should have well established Installation, Commissioning, Training, Troubleshooting and Maintenance Service group in INDIA for attending the after sales service. Details of Service Centres near consignee destinations are to be uploaded along with the bid.

6. **Generic**

   Supplier shall ensure that the Invoice is raised in the name of Consignee with GSTIN of Consignee only.

7. **Generic**

   While generating invoice in GeM portal, the seller must upload scanned copy of GST invoice and the screenshot of GST portal confirming payment of GST.

8. **Generic**

   The buyer organization is an institution eligible for concessional rates of GST as notified by the Government of India. The goods for which bids have been invited fall under classification of GST concession and the conditions for eligibility of concession are met by the institution. A certificate to this effect will be issued by Buyer to the Seller after award of the Contract. Sellers are requested to submit their bids after accounting for the Concessional rate of GST.
   Applicable Concessional rate of GST : 5%
   Notification No.and date : 3/2017 dated 28/06/2017

9. **Generic**

   Whereever Essentiality Certificate is applicable (PEL/ML), successful bidder should provide Proforma Invoice for processeing for EC application and material should be dispatche after receiving of EC rom DGH. In view of the same, an ATC may be incorporated in GeM, viz, "BIDDER/OEM must provide Proforma Invoice for processeing for EC application within 210 days from date of issue of GeM Contract and material should be dispatche after receiving of EC rom DGH."

Disclaimer

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization. Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specification and / or terms and conditions governing the bid. Any clause incorporated by the Buyer such as demanding Tender Sample, incorporating any clause against the MSME policy and Preference to make in India Policy, mandating any Brand names or Foreign Certification, changing the default time period for Acceptance of material or payment timeline governed by OM of Department of Expenditure shall be null and void and would not be considered part of bid. Further any reference of conditions published on any external site or reference to external documents / clauses shall also be null and void. If any seller has any objection / grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

This Bid is also governed by the General Terms and Conditions

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, 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. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.

---Thank You---

Ref: PR No. 1422514

Scope: Upgradation of Gas Compressor Control Panels from Pneumatic to Electronic at various locations, Qty.: 3 Nos.

ANNEXURE – AA

AA:: TECHNICAL SPECIFICATIONS & QUANTITY OF ITEMS

SCOPE OF SUPPLY AND TECHNICAL SPECIFICATION

1.0 PREAMBLE

This document together with the attachments defines and covers the guidelines for Design, Engineering, selection of equipment, equipment specification, scope of work, Inspection & Testing, Installation and commissioning requirements complete with all accessories and materials for "**Up-gradation of Pneumatic based Local Control Panel and associated pneumatic field instruments to Programmable/configurable electronic logic controller based local control Panel and associated electronic field instruments for Gas Lifter compressor packages."**

2.0 LOCATION DETAILS

All the locations are within 35 kms radius of Duliajan. The stations are approachable via motor-able roads.

3.0 ENVIRONMENTAL CONDITIONS

The general climatic conditions are as stated below:

- Maximum Ambient Temperature 42 DegC
- Minimum Ambient Temperature 7 DegC
- Relative Humidity
- At 21 Deg C : 100 %
- At 32 Deg C : 95%
- At 41 Deg C: 70%
- Elevation Above Mean Sea Level : 170 metres
- Seismic Zone: V
- Yearly Average Rainfall : 300 cm

4.0 DETAILS OF COMPRESSOR UNITS

The operating philosophy of the compressor will be as per attached **Annexure-1** for only reference purpose. Final operating philosophy will be fixed during detailed engineering.

5.0 SCOPE OF OIL INDIA LIMITED SUPPLY

OIL shall provide the following:

a) **Electrical Power Supply:**
   - For Control Panel:
   - Rated voltage: 230 V-AC (± 10%), single (1) phase, Rated frequency: 50 Hz (± 5 Hz) will be available.

- Work site illumination and any other utility power.
- Bidder shall lay cable from the existing electrical feeder to the UPS. Bidder to also lay power cable from UPS to control panel. (total approximately 200 metres for each panel)

b) **Instrument Air:**

- Operating Pressure : 6 - 9 kg/cm2(g), Temperature : 65°C Maximum
- Air supply is available near the existing panel. If any regulator, air header, isolation valves or tubing and fittings are required, then the bidder has to provide the same.

6.0 SCOPE OF SUPPLY AND SERVICES

6.1. Job envisaged is the replacement of the existing pneumatic control panel for natural gas compressor and associated pneumatic field instruments with electronic control panel for natural gas compressor and associated field instruments.

6.2. Bidder shall be responsible for all types of erection, electrical, instrumentation work including, but not limited to the following: Complete design, detailed engineering, preparation of drawings / documents, sizing, selection, procurement, installation and commissioning of the panel with its accessories, field instruments and controls etc., tubing, dressing , supports, cabling, testing, calibration, loop checking, arranging all the various types of equipment required for testing and calibration.

6.3. All equipment supplied shall be from reputed manufacturers and be field proven, both with respect to design and materials.

6.4. Bidder shall provide document and clearly specify the provisions and schemes which they are proposing for control panels, power supply, HMI/ Display facility and UPS (Uninterrupted power supply) distribution scheme etc. Bidder shall take approval during detailed engineering from OIL for the documents and schemes provided and only after the receipt of approval shall proceed further.

6.5. Bidder shall be responsible for co-ordination with other agencies like OEMs for various instrument/Equipment /devices etc. which are under their scope of supply.

6.6. Proper selection of various component /instruments/item should be carried out for IEC Zone-2 Gr. IIA/IIB/IIC T3

6.7. Uniformity in selection should be maintained for makes of similar Instrument and their accessories for operational convenience, ease of maintenance and spare parts inventory point of view.

6.8. If there is any conflict in respect of specification, data sheets, related standards, code etc., bidder shall refer the matter to OIL for clarification and only after obtaining the same they should proceed further.

6.9. The system designed shall be complete in every aspect and sufficient for the safe, efficient and easy operation, start up and shut down of the Gas Compressor unit.

6.10. All standards, code of practices to be followed up shall be of the latest edition.

6.11. Materials of construction of item to be supplied shall be consistent with temperature, pressure, corrosion conditions and other process requirement.

7.0 CONTROL PANEL PHILOSOPHY

7.1. The design of the control panel shall be of Programmable/configurable electronic logic controller (Microprocessor based) based, designed for Engine Driven Reciprocating Gas Compressor packages.

7.2. The control panel shall be suitable for use in IEC Zone-2 Gr. IIA/IIB/IIC T3

7.3. Inside the control panel, the use of FLP junction box is not acceptable.

7.4. Purged and pressurized control panel is not acceptable.

7.5. The panel shall be so designed that minimum time is taken for the maintenance crew to open the panel door without having to remove any nuts and bolts.

7.6. The control panel shall be equipped with a Human Machine Interface (HMI) unit which shall be easily accessible by the operator. The fault functions shall be both visually (in the control panel HMI/ Display facility) and audibly indicated and shall remain 'ON' until manual reset. All the process parameters shall be displayed on an HMI/ Display facility on the panel. The HMI shall be accessible to the user without opening the control panel.

7.7. It will have sequence starting system to ensure that all functions associated with starting operation are performed in correct sequence such as pre lube, warmup, loading, post lube etc. The startup and shutdown shall be by means of hardwired switch on the control panel. Provision shall also be incorporated for emergency shutdown of the compressor unit through a hardwired push button. Additionally the unit shall also have the provision for startup and shutdown from HMI through software button.

7.8. Bidder shall be required to supply all relevant hardware, controller programming along with software for modification, upload & download of the control program with licenses as required. The required licenses shall be with lifetime validity. Panels to be supplied with Controller hardware installed and pre-wired within control panel.

7.9. It will be in the scope of the Bidder to Design, develop and configure the Controller programming and upload the same in proposed Controller to incorporate all safety

interlock for the process, start-up and shutdown sequences for compressors including the erection and commissioning of the new control panels (which will be located at the place of existing pneumatic control panel on the compressor skid).

7.10. The panel will have the provision to terminate the field cables from field instruments/equipment through double compression FLP cable gland and cabling & termination job will be in bidder's scope.

7.11. After erection of the panel (in place of existing panel) no welding /cutting job will be allowed near the compressor skid under the compressor shed. Bidder shall complete all such required job beforehand.

7.12. Bidders shall be required to consider all Input devices and output devices for the configuration of Controller hardware to meet control requirements in line with existing control philosophy of the unit. In case any extra input or output devices are felt necessary to be included and configured within the system for the safe and reliable operation of the natural gas compressor, the same shall be categorically mentioned in the bid document and the cost shall be included in the bid.

7.13. The control system should operate on fail safe principle.

7.14. Distribution of power supply for the supplied field instruments shall be from the control panel itself. Bidder to consider the same during the design of the panel. Power supply system shall have adequate capacity to accommodate additional input/output (I/O) signals to load up to 100% of I/O capacity

7.15. Bidder shall provide 10% spare I/O channels for each type of I/O and the same shall be wired upto the terminal block.

7.16. Field instruments shall be connected to the control panel through optical isolators.

7.17. Control panel shall be designed such that user can access the control program and HMI remotely through both LAN and cellular internet.

7.18. Normal operation of the natural gas compressor shall be through the HMI on the control panel.

7.19. There shall be the provision for audio visual alarms. Audible alarm shall be through a suitably loud hooter. And visual alarm shall be through a flasher.

7.20. There shall be facility for historical trends. Also, event logging shall be available. It shall be possible to store historical trends of at least 40 data points for minimum 60 days at 5 seconds sampling time.

7.21. Control panel software shall have protection against un-authorized access. There shall be atleast two types of access levels – Operator Access and Engineering Access protected by user configurable password. Under operator access only viewing and operating privilege shall be granted. Under engineering access all the facility granted under normal access and additionally the permission to change parameters and set points, alarms limits shall be granted. Additionally under engineering access the permission for enabling and disabling alarms shall be provided.

7.22. There shall be facility for auto & manual selection of bypass /recycle control PID loop from the panel.

7.23. There shall be a provision for timer based operation of the 1^{st} stage and 2^{nd} stage scrubber dump valves through an arrangement of timer for each stage implemented in the controller and solenoid valves.

7.24. There shall be facility for auto & manual selection of speed control PID loop from the panel.

7.25. There shall be facility for manual pneumatic engine speed control through a precision pressure regulator and with a panel mounted dial gauge for rpm. There shall be a selector switch to choose between pneumatic engine speed control and electronic speed control.

7.26. Alarm set point, trip set point, timer set time etc. shall be user configurable through HMI.

7.27. Compressor speed shall be measured and displayed on the HMI in rpm.

8.0 FIELD INSTRUMENTS PHILOSPHY

8.1 All electronic field instruments shall operate on 24 volts DC. When no suitable 24VDC device is available the bidder shall take approval from OIL during detailed engineering stage to supply a field device of different operating voltage.

8.2 All electronic instruments shall be immune to Radio frequency interference

8.3 Pressure reading shall be routed through transmitter to the control panel. All transmitters shall be arranged near or inside the control panel to save space.

8.4 Bidder shall provide thermocouple/ RTD for temperature measurement which shall be routed to the control panel directly to temperature IO card. Additionally it shall be in

the scope of bidder to lay 14 core K-type thermocouple extension cable (approximately 50 metres in length) from engine temperature measurement junction box to control panel for configuring the engine temperature readings in the control panel.

8.5 Gauges for important parameters shall be provided and the same shall be arranged such that operator can look at all the readings at one place. The gauges shall be arranged such that the gauges are placed in the same area, facing the same direction for the ease of operator.

8.6 RPM sensor for speed measurement shall be provided which shall be of non contact type for displaying the speed in RPM.

8.7 I/P convertor shall be provided for operating bypass/ recycle control valve.

8.8 I/P convertor shall be provided for automatic speed control.

8.9 Air filter regulators shall be provided wherever necessary to control the pressure of instrument air for control purposes.

8.10 Level switches shall be provided for compressor oil level application, engine oil level application, 1st stage scrubber level application and 2nd stage scrubber level application.

8.11 Level switches of Murphy Make LM301-Ex shall be supplied for compressor oil and engine oil low level tripping application.

8.12 Vibration transmitter shall be used to measure the vibration and the same shall be installed using glue pad if no other viable method for installation is found.

8.13 Solenoid operated valves shall be provided to start engine pre-lube pump, compressor pre-lube pump, air starter, fuel shut off valve, scrubber dump valves. Additionally solenoid operated valves shall be provided to cut off air supply to the I/P converters.

8.14 SS tubing and SS fittings shall be used of Swagelok, Parker or Sandvik make.

9.0 CABLING PHILOSOPHY:

9.1 Signal /multi core cables shall be armoured and stranded copper conductor of minimum 1.0 Sq.mm or higher.

9.2 Power cables shall be three core armoured cables. It will be of stranded copper conductor of minimum 1.5 Sq.mm or higher according to power loading calculations.

9.3 Control cables for Solenoid Operated Valve shall be three core armoured cables. It will be of stranded copper conductor of minimum 1.5 Sq.mm or higher.

9.4 All the above ground cables shall be laid in galvanized metallic cable trays. Underground cables shall be laid with proper sand and brick back filling with cable markers.

9.5 Entry of the cables to the operator's room/control room terminating in the control panel should be neat and exposed portion should be routed through cable tray mounted on wall.

9.6 All cables shall have tags plates at source and destination ends identifying the cable.

9.7 All cable terminations shall have ferrules. All ferrules shall follow cross ferruling identification philosophy in which Source termination point and Destination termination point shall be shown.

9.8 Power cables shall be laid such that there shall not be any electromagnetic interference with signal cables.

10.0 JUNCTION BOX:

10.1 Junction boxes shall be weather-proof to IP65. Relevant certificate has to be furnished by the bidder.

10.2 The junction boxes shall be provided with sufficient number of terminals to terminate all the pairs of multi-cable (including spare pairs) and shields of individual pairs as applicable.

10.3 Junction boxes shall have separate external terminal for accommodating earthing wires up to 10sqmm.

10.4 Unused cable gland entries should be properly sealed with suitable SS blind plugs as per safety standards for Hazardous area applications.

10.5 Junction boxes shall have unique tag number and the same shall be affixed on the junction box with a tag plate.

11.0 CABLE GLANDS:

11.1 All cable glands shall be double compression type, nickel-plated and weather proof and flameproof suitable for installation in an area classification of IEC Zone II Gas Group IIA/IIB/IIC T3.

11.2 The cable glands shall be provided with PVC hood.

11.3 Cable glands shall be suitable for cable dimensions with +/- 2mm tolerance.

11.4 The plugs and adaptors shall also be weather proof and flameproof suitable for installation in an area classification of IEC Zone II Gas Group IIA/IIB/IIC T3

12.0 EARTHING SYSTEM:

12.1 Installation & commissioning of the necessary earthing system for control panel and other instruments shall be under scope of bidders. The earthing system shall be of readymade maintenance free CPRI approved chemical earthing system with 50 mm diameter 3.00 Metres length corrosion free G.I. pipe Electrode complete with backfill compound Minerals 50 Kg and Earth pit cover including excavation of earth pit and construction brick earth chamber including plastering both inner & outer surface of brick wall as specified and directed by Engineer in charge. Size of brick chamber shall be 2 feet x 2 feet.

12.2 All signal circuits shall be grounded as per the instrument manufacturer's recommendations and good practices.

12.3 All circuits must be grounded at one point only.

12.4 All instrument cases and housing capable of carrying current shall be grounded to the panel structure. The panel structure will in turn be grounded to main ground.

13.0 COMMUNICATION PHILOSOPHY:

13.1 Bidder shall design the communication system such that user can access the controller remotely through LAN and cellular network.

13.2 Bidder shall supply one laptop with the entire lot suitable for use in IEC Zone-2 Gr. IIA/IIB/IIC T3 for local configuration of the controller and HMI along with necessary cables and peripherals as needed for communicating the laptop with HMI/ controller.

13.3 Bidder shall supply lifetime valid software's required for configuration of the controller including editing control logic, configuration of the HMI including editing the supplied graphics and configuration of any other component of the supplied control system that requires configuration.

13.4 Bidder shall keep provision for communication of the local control panels with existing SCADA through Modbus RS485.

14.0 UPS AND POWER PHILOSOPHY:

14.1 UPS of 4 hours back up which is capable of supplying power to two identical control panels and associated field instruments shall be supplied.

14.2 Powering the control panel will be through the UPS only.

14.3 The UPS power supply shall be sized to the requirement of the installed load with 20% spare capacity.

15.0PROGRAMMABLE CONTROLLER INPUTS/ OUTPUTS:

Bidders shall be required to supply minimum Input and output as mentioned under for configuration of the Controller and hardware to be provided to meet control requirements of 1nos. of gas lifter compressor package. In case, any extra input or output devices are felt necessary to be included and configured within the system, the same shall be indicated during detailed engineering without any extra cost to OIL. Even during system pre-commissioning or testing if OIL feels necessary to have trending or real time data logging or monitoring of some other additional process data in the operating system, bidder shall be ready to carry out requisite engineering and configure the same within the system without any extra cost to OIL as long as no additional hardware is necessary for the controller or field devices.

Analog Inputs:

SL No	Parameters	Quantity
1	Engine Fuel Gas Inlet Pressure	**1 No.**
2	1st Stage Suction Pressure	**1 No.**
3	1st Stage Discharge Pressure	**1 No.**
4	2ndStage Suction Pressure	**1 No.**
5	2ndStage Discharge Pressure	**1 No.**
6	Compressor Oil Pressure	**1 No.**
7	Engine Oil Pressure	**1 No.**
8	Instrument Air Pressure	**1 No.**
9	Cranking Air Pressure	**1 No.**
10	Engine intake manifold pressure right bank	**1 No.**
11	Engine intake manifold pressure left bank	**1 No.**
12	Compressor vibration(frame& throws)	**3nos.**
13	Engine vibration	**2 nos.**
14	Cooler vibration	**2 nos.**

ANALOG THERMOCOUPLE INPUT(TYPE-K)

SL No.	Parameter	Quantity
1	ENGINE FUEL GAS INLET TEMPERATURE	**1 No.**
2	1ST STAGE SUCTION TEMPERATURE	**1 No.**
3	1ST STAGE DISCHARGE TEMPERATURE	**1 No.**
4	2ND STAGE SUCTION TEMPERATURE	**1 No.**
5	2ND STAGE DISCHARGE TEMPERATURE	**1 No.**
6	COMPRESSOR OIL TEMPERATURE	**1 No.**
7	ENGINE OIL TEMPERATURE	**1 No.**
8	COMPRESSOR/AUXILLARY JACKET WATER TEMPERATURE	**1 No.**
9	ENGINE JACKET WATER TEMPERATURE	**1 No.**
10	ENGINE INTAKE MANIFOLD RIGHT BANK TEMPERATURE	**1 No.**
11	ENGINE INTAKE MANIFOLD LEFT BANK TEMPERATURE	**1 No.**
12	EXH. TEMPERATURE (for all cylinders)	

13	EXCESSIVE EXH. TEMPERATURE RIGHT BANK	**Thermocouples are installed. Bidder shall be responsible for cabling of the sensors from junction box to supplied control panel.**
14	EXCESSIVE EXH. TEMPERATURE LEFT BANK	

ANALOG OUTPUTS:

SL No	Parameters	Quantity
1	RECYCLE CONTROL (I/P)	**1 No.**
2	SPEED CONTROL (I/P)	**1 No.**

DIGITAL INPUT:

SL No.	Parameters	Quantity
1	EMERGENCY STOP	**1 No.**
2	1^{ST} STAGE SUCTION SCRUBBER LIQUID LEVEL HH	**1 No.**
3	2^{ND} STAGE SUCTION SCRUBBER LIQUID LEVEL HH	**1 No.**
4	COMPRESSOR LUBE OIL NO FLOW	**1 No.**
5	COMPRESSOR LUBE OIL LEVEL LL	**1 No.**
6	ENGINE LUBE OIL LEVEL LL	**1 No.**
7	ENGINE JACKET WATER NO FLOW(DP TYPE) LL	**1 No.**
8	COMPRESSOR JACKET WATER NO FLOW(DP TYPE) LL	**1 No.**
9	1^{ST} STAGE SUCTION PRESSURE HIGH	**1 No.**
10	1^{ST} STAGE SUCTION PRESSURE LOW	**1 No.**
11	1^{ST} STAGE DISCHARGE PRESSURE HIGH	**1 No.**
12	1^{ST} STAGE DISCHARGE PRESSURE LOW	**1 No.**
13	2^{ND} STAGE SUCTION PRESSURE HIGH	**1 No.**
14	2^{ND} STAGE SUCTION PRESSURE LOW	**1 No.**
15	2^{ND} STAGE DISCHARGE PRESSURE HIGH	**1 No.**
16	2^{ND} STAGE DISCHARGE PRESSURE LOW	**1 No.**

DIGITAL OUTPUT:

SL No.	Parameters	Quantity
1	COMPRESSOR PRELUBE	**1 No.**
2	ENGINE PRELUBE	**1 No.**
3	CRANK	**1 No.**
4	IGNITION	**1 No.**
5	FUEL ON	**1 No.**
6	ALARM HORN	**1 No.**
7	UNIT RUN STATUS RELAY	**1 No.**

8	1ST STAGE SCRUBBER DUMP VALVE	**1 No.**
9	2ND STAGE SCRUBBER DUMP VALVE	**1 No.**

FREQUENCY INPUT:

SL No.	Parameter	Quantity
1	**ENGINE RPM**	**1 No.**

16.0LIST OF MANUAL GAUGES:

Analog gauge shall be provided to monitor process parameters of compressor and Engine as given below:

a) Gas suction and discharge pressure for each stage.
b) Gas suction and discharge temperature for each stage
c) Compressor lube oil header pressure
d) Engine oil header pressure
e) Engine cooling water temperature
f) Compressor cooling water temperature

The analog gauge board shall be placed on the side of the control panel.

17.0TECHNICAL SPECIFICATIONS:

Minimum technical specifications for selected items are listed below:

17.1 Control Panel:

The minimum specifications for control panel are as follows:

a) Type : Enclosed self-supporting, rigid assembly & lockable type
b) Material : Metal body
c) Panel shall be provided with lifting lugs for lifting of the panels
d) Ambient Temperature : Maximum 50 deg C
e) Cable connection : Double compression FLP Cable gland
f) Cable entry : Bottom
g) Terminal type : Spring loaded
h) I/O Card mounting rack: As per manufacturer's standard
i) Wired Spare Terminals : 10% of each type of I/O after complete wiring
j) Audio-Visual Alarm: Audio alarm through a hooter on/near the panel and visual alarm on HMI/ Display facility and flasher.
k) Ingress Protection: IP 65
l) Maximum dimension of the panel include floor support: Length=4 feet, Width= 1 feet 4 inches

17.1.1 Control Panel Piping And Tubing:

a. Any pneumatic supply should be from an air header. The instrument air header shall be suitably sized, with isolation valves and shall be complete with suitable filter-cum-air regulators. 10% spare tapping points shall be provided. Unused tapping points shall be plugged.
b. All Instrumentation tube, tube fittings, valve, plugs etc. shall be of SS-316 (NPT), suitably protected against corrosion.

18.0 Control Panel Wiring:

a. Open terminals shall generally be avoided.
b. Multi stranded PVC insulated copper conductor shall be used in general with printed ferruling (ferruling is to be done in cross way like DEST/SOURCE).
c. Wire carrying measurement signals associated with pressure transmitters, thermocouple and other low voltage level signals shall be routed in separate wire channels and not along-with power cables.(color identification of signal cables may also be followed up as far as possible)

18.1 Microprocessor based Programmable/configurable electronic logic controller:

The specification given below is the minimum requirement and not restricted to the following:
Model : Latest model of Programmable/configurable electronic logic controller. Bidder to specify

18.1.1 Hardware & Software:

a) Processor: Processor shall be capable of handling all the parameters and all control loops, indications, annunciations etc. It shall have sufficient memory capacity with minimum of 20% extra memory as spare.
b) Rack: As per Manufacturer's standard.
c) I/O Card : Shall support the following
   i. Analog Input
   ii. Analog Output
   iii. Digital Input
   iv. Digital Output
   v. Thermocouple input
d) Software: Latest Windows based application software for developing logic etc. on Windows operating system based device.
e) Communication Ports: As per manufacturer to meet the philosophy mentioned in this document.

19.0 Other functional specification for Programmable/configurable electronic logic controller:

i) Controller Scan Time:
The scan time of the PLC should be 250 msec or less. Scan time of Controller is defined as the cycle time taken by the system to read input, process input executing logic, and update control output for all the logics configured within the system. Other activities like diagnostic routines, output/dump of data to peripherals, or any other activity that consume processor time shall also be accounted while computing scan time.

ii) System Hardware Requirements**:**

1. Each I/O channel should be isolated from each other.
2. Each I/O shall be protected against the reversal of polarity of the power voltage to I/O.

3. All the inputs shall be double ended i.e. two wires per input and not with common return for all inputs.

iii) Processor System**:**

1. The size of the memory shall be sufficient for storage of the program instructions required by the logic schemes and other functional requirements
2. Memory shall be non-volatile. However, in case volatile memory is provided, battery back-up shall be provided with a minimum of 12 months lifetime to keep the program storage intact. A battery life indication should be provided.
3. The system shall indicate the first out alarm contact in case of any tripping.

iv) System/ Application Software Requirements**:**

1. The system software shall include all programs for the Controller and HMI/ Display facility which are required to perform all functions.
2. All operating and application software shall be the latest revision.
3. Software shall have the facility for generation of various displays of process alarms, system alarms, events etc. Two sets of backup copies of the software shall be provided in CD.
4. All details and description shall be provided for the software package
5. It shall be possible to download changes in software.
6. The central processing unit shall, under normal working conditions, be less than 70% loaded. This loading shall be demonstrated during FAT.

19.1 Human Machine Interface (HMI)/ Display facility:

The control panel will be equipped with a minimum 12-inch HMI/ Display facility with touch screen facility

- for display of critical engine and compressor process data.
- to facilitate trouble-shooting
- to display SOE (Sequence of Events)
- To display the alarm & trip status
- To change the trip, alarm and timer set point, PID tuning parameters
- To display historical trends

The HMI/ Display facility shall be easily accessible and easily configurable.

19.2 Cable & JB specification:

All cables shall be provided with marking including manufacturer's name , insulation material, conductor size , no. of pairs , voltage rating , type of cable etc. , progressive sequential marking of the length at every one meter. All cables shall be PVC insulated. The insulation grade shall be 1100V as minimum. All cables shall be armoured. Cable Gland for armoured cable should be FLP Double Compression Gland of SS316.

a) The cable shall be new and in good condition and shall be suitable for layering and bunching in ladders, trays and ducts.

b) All power and control cables shall be flame retardant, low smoke type with sunlight and oil resistant outer sheath, suitable for installation on onshore oil and gas processing facilities.

c) Cables shall be flexible; suitable for easy termination.

Minimum Requirements:

19.2.1 Signal Cable Specification (for analog signals)

a. Type of cable: PVC Insulated (Fire Retardant Low Smoke) copper cable, single triad, shielded copper cable
b. Construction: Multi strand/ solid annealed electrolytic copper
c. Conductor: 1 sq. mm
d. Primary Insulation: Extruded PVC
e. Voltage rating: 1100 volts
f. Shield: Each triad shall be shielded with aluminum backed mylar
g. Armour: Armour shall be of Galvanised steel wire
h. Drain wire material : Annealed Tin Copper

19.2.2 Control Cable Specification (for digital input and digital output)

a. Type of cable: PVC Insulated (Fire Redundant Low Smoke) armoured copper cable, 3 core
b. Construction: 1.5 sq. mm size, solid bright annealed electrolytic copper conductor, insulated and sheathed.
c. Voltage Rating: Up to and including 1100 volts
d. Primary Insulation: Extruded PVC
e. Armour: Armour shall be of Galvanised steel wire

19.2.3 Power Cable Specification

a. Type of cable: PVC Insulated (Fire Redundant Low Smoke) armoured copper cable
b. Construction: Size as per design requirement, copper conductor
c. Voltage Rating: Up to and including 1100 volts
d. Primary Insulation: Extruded PVC
e. Armour: Armour shall be of Galvanised steel wire
f. Core Identification: Red, Black and Green

19.2.4 Thermocouple Cable Specification

a. Type of cable: Thermocouple Extension Cable, K type (Chromel-Alumel)
b. Quantity Tolerance: +/- 5 %
c. Conductor Size: 16 AWG
d. Armour: Armour shall be of Galvanised steel wire
e. Voltage Grade(V): 600
f. No. of pairs: 2
g. No. of strands: 1
h. Primary Insulation: Extruded PVC
i. Shield: Aluminium backed mylar tape
j. Drain wire material : Annealed Tin Copper
k. Overall Drain wire Size (sqmm): 0.5 approx.

19.2.5 Junction Box Specifications

a. Thread type: Suitable for NPT (M) cable gland.
b. Electrical area classification: IEC Zone-2 Gr. IIA/IIB/IIC T3
c. Weatherproofing: Conforming to IP54 or better/ Equivalent NEMA rating
d. Operating area classification & Temperature category to be embossed on the body of the junction box.
e. Earthing Points: 1 No.inside, 2 Nos.outside
f. Spare Entry points: There should be 2 numbers which shall be plugged with SS plugs.
g. Size: Should be sufficiently designed such that there is minimum 4 inches clearance for cable termination
h. Mounting inside JB: DIN rail type.

19.3 Pressure Transmitter:

a. Operating Voltage: 24Vdc
b. Electrical area classification: IEC Zone-2 Gr. IIA/IIB/IIC T3
c. Output: 4-20ma
d. Type: Without display
e. Material of Construction: Stainless-steel
f. Accuracy: Shall not exceed +-0.25% of span
g. Stability: Shall not exceed +-0.25% span over 1 year
h. Ingress Protection: IP66

19.4 Pressure Gauge:

a. Type: Direct Reading, Glycerin Filled
b. Mounting: Local
c. Accuracy: +/- 1.0% of Span
d. Dial size: minimum 100 mm
e. Dial colour: White black lettering
f. Case material: SS
g. Enclosure: IP 66
h. Lens: Laminated safety glass lens
i. Pressure element: Bourdon tube
j. Element Material: SS
k. Socket material: SS
l. Connection: 1/4 inch NPT(M)
m. Over range protection: 130 % of full scale
n. Units: Kg/cm2

19.5 Temperature Gauge:

a. Type: Direct Reading, Glycerin Filled
b. Mounting: Local
c. Accuracy: +/- 2.0% of Span
d. Dial size: minimum 100 mm
e. Dial colour: White black lettering
f. Case material: SS
g. Enclosure: IP 65 Lens: Laminated safety glass lens
h. Capillary: SS with armour
i. Units: Deg C

19.6 Pressure Switch:

a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
b. Supply Voltage: 24Vdc

c. Ingress Protection: IP65.
d. Enclosure Material-Metallic
e. Element Type: Diaphragm or other suitable element
f. Element Material-SS316
g. Process connection Size: 1/2" NPTF
h. Electrical connection-1/2 inch NPTF
i. Total nos. of cable entry required-single.
j. Type-Snap Action Micro Switch
k. Contact Arrangement-SPDT
l. Repeatability: Less than +- 1% of span

19.7 Scrubber Level Switch:

a. Pressure rating: 120 bar minimum
b. Supply voltage: 24Vdc
c. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
d. Process Connection: 2” NPTM
e. Float Material: SS or similar
f. Body Material: Metallic
g. Switch type: Snap Action Micro Switch
h. Contact Arrangement: SPDT

19.8 UPS:

a. Type: Double conversion On-Line UPS System with IGBT/ DSP based technology
b. UPS rated power: Bidder to indicate the load calculation and mention the required rating of UPS offered.
c. Input Power: Voltage Range- 160-276VAC,1Phase; Input Power Factor-0.8; Input Frequency range-50±5Hz(45-55Hz)
d. Output Power: Output Voltage-230±1%of rated output voltage, AC,1phase; Static Regulation- +/-3%of nominal regulation; Output Frequency-50Hz±1%; Output waveform- Sinusoidal with relative harmonic not exceeding 4%for linear and non - linear load; Output Power Factor- 0.8 or better.
e. Load Crest Factor- 3:1
f. Efficiency: > 90%in high efficiency mode; >85%in normal mode.
g. Battery: Sealed Maintenance Free (SMF) Lead Acid battery
h. Backup time: The UPS should capable to provide 1 hour battery backup time at full load.
i. Battery Rating &Configuration: Total number of batteries required for 1 hour min backup at full load, Voltage of each battery, Ampere-Hour rating of each battery should be clearly mention in the offer.
j. Bypass Facility: Static &Manual Bypass
k. Indication LCD Panel: The UPS should have a LCD panel with keypad and backlight. It should provide useful information about the UPS itself, operating status & diagnostic indication, load status, events.
l. Measurements and settings. The Event Log and alarms should display on the LCD Panel.
m. Operation mode: Cold Start Feature -Should allow UPS to start on Batteries without utility input; Auto Re-Start Feature-The UPS should automatically restart if utility returns after the output was shutoff due to exhausted batteries; Automatic Bypass- UPS should have automatic Transfer to Bypass When Overload condition occurs.
n. Environment: Ambient Operating Temperature Upto 40degC; Relative Humidity-Should not exceed 95% non-condensing.

19.9 Electronic Hooter:

a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
b. Operating Voltage: 24Vdc
c. Sound Output: Minimum 100 dB
d. Ingress Protection: Minimum IP65

19.10 Electronic Flasher:

a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
b. Operating Voltage: 24Vdc
c. Effective Intensity: Minimum 100 Cd
d. Ingress Protection: Minimum IP65

19.11 Vibration Measurement:

a. Frequency Response: atleast 3 Hz to 1000 Hz
b. Type: Piezo electric
c. Full scale: atleast 0-50mm/s rms
d. Supply Voltage: 24Vdc
e. Output: 4-20ma
f. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3

19.12 I/P Convertor

a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
b. Input signal: 4-20ma
c. Output signal: 3-15psi
d. Supply pressure: 20 psi
e. Output air capacity: Minimum 6 Nm3/hr
f. Accuracy: At least +- 0.5% of span
g. Repeatability: At least +- 0.3% of span
h. Body material: Metal
i. Adjustment: Zero and span adjustment shall be possible
j. Process connections: ½" NPTF
k. Electrical connections: 1/2" NPTF.
l. Ingress Protection: atleast IP66

19.13 Solenoid Valve

a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3
b. Type: Direct acting
c. Body material: Metal
d. Ingress Protection: atleast IP66
e. Operating Voltage: 24Vdc
f. Electrical connection: ½" NPTF

19.14 Laptop

a. Processor: Intel Core i7
b. Operating System: Latest Microsoft Windows Professional
c. Graphics: Intel HD graphics or better
d. Display: Minimum 14"
e. RAM: Minimum 16GB
f. Storage: Minimum 512GB SSD
g. Keyboard: Inbuilt
h. Touchpad: Inbuilt
i. Optical Drive: DVD read/write capable
j. LAN Port(RJ45): Minimum 01 numbers.
k. Serial Port (9 pin; D-Sub): Minimum 01 numbers
l. USB port: Minimum 03 numbers
m. Communications: 10/100/1000 base T- ethernet; Intel dual band wireless; Bluetooth

n. Pre-installed software: Lifetime Licensed versions of Microsoft Excel, Microsoft Word and lifetime licensed versions of any other software required for configuring the supplied controller, HMI and any other component of the supplied control system that requires configuration.
o. Hazardous Area Certification: IEC Zone-2 Gr. IIA/IIB/IIC T3 or equivalent ANSI 12.12.01 compliant.
p. Battery: Minimum 4 hours of backup
q. Accessories: Carrying Case.

20 BILL OF MATERIALS

BILL OF MATERIALS (BOM): Tentative BOM based on the above specifications and scope of work should be submitted by the bidder along with their technical bid. However any additional requirement, if found necessary to make the system functional and fulfil its purpose, bidder needs to supply the same without any extra cost to OIL. Bill of materials for reference purpose has been attached as Annexure-3.

21 CHECKLISTS

Duly Filled Technical specification checksheet, BEC BRC checksheet and Bill Of Materials shall be supplied by the bidder.

22.0 INSTALLATION AND COMMISSIONING:

At site for every panel supplied, the following are primary work to be carried out by the bidder:

22.1 Removal of the existing pneumatic control panel, pneumatic instruments and tubing.

22.2 Grouting work: Grouting of the panel in place of existing pneumatic panel on the compressor package skid.

22.3 Electrical work:

a) Laying and termination of Power cables and commissioning of the UPS and Power up the control panel through the UPS. Also bidder shall lay the power cable from electrical feeder present in the installation to the UPS.
b) Construction of required earth pits and termination to earth pit at panel side shall be in bidder's scope. Bidder shall test the earth pit and demonstrate to the satisfaction of OIL that the resistance is under acceptable limits.
c) Laying of earth strips will be in the bidder's scope.

22.4 Instrumentation work:

a) Installation & Commissioning of Control panel
b) Installation of field devices
c) Laying cable, Termination/hookup of Field devices
d) Laying & termination of all types of control cables and signal cables and associated jobs required for commissioning of the panel
e) Calibration & loop checking of field / Panel instruments.
f) Checking/verifying of the control panel as per Control scheme through Programmable/configurable electronic logic controller
g) Testing & acceptance for performance run at site for after complete configuration and hook up
h) Performance runs of the entire control panel system including UPS system for 72 hours.

22.5 The system to be under observation for minimum 72 hours for satisfactory commissioning performance.

22.6 Installation and Commissioning charges must be quoted separately (should not be clubbed together with main equipment) on lump sum basis which shall be considered for evaluation of the offers.

22.7 While quoting Installation/Commissioning charges above, bidder should take into account all charges including to and fro fares, boarding/lodging, local transport at Duliajan, Assam, and other expenses of supplier's personnel during their stay at Duliajan.

22.8 Bidder shall ensure that installation and commissioning of the control panel is completed at the shortest time possible as un-availability of the compressor unit adversely affects production. Additionally the bidder shall prepare an installation and commissioning plan and get the same approved by OIL before the start of installation and commissioning.

23.0 NOTES TO INSTALLATION AND COMMISSIONING AND SAFETY MEASURES

23.1 Work will be done normally during day light hours & irrespective of holidays, Sundays etc. However, in case of emergency, work may have to be done beyond normal working hours with prior permission from Installation Managers/user department/CISF.

23.2 The successful bidder must obtain "Entry Permit" from CISF Commandant/ Head-Security of OIL for all his workers to enable them to work inside the installations.

23.3 NUISANCE: - The successful bidder or his representative shall not at any time cause any nuisance on the site or do anything which shall cause un-necessary disturbance in the installation. OIL reserves the right to reject any one or all the personnel deployed by the successful bidder on the basis of their performance, conduct and discipline. If any replacement is sought by Engineer-in-Charge, the same shall have to be arranged by the successful bidder within 24 Hours or as per instruction of Engineer-in-Charge. In case of any dispute the decision of Engineerin-Charge shall be final and binding.

23.4 CARE OF WORKS: - From the commencement to completion of work, the successful bidder shall take full responsibility for the care of all equipment and pipelines including all temporary works and in case any damage, loss or injury shall happen to the equipment/work/person or to a part thereof due to negligence of the successful bidder, the same shall be rectified/compensated by the successful bidder without any extra claim.

23.5 The successful bidder shall abide by all safety and security rules and regulations existing in the OIL's Installations. The successful bidder shall observe the safety measures required to be undertaken for safety of persons, labour, public and properties at work site/ plant premises/ residential premises/ public places etc. The successful bidder shall be required to take work permit from respective shift in charges for each day and each shift for all kind of jobs. There can be instances of not getting permits, withdrawing of permits already issued at any stage of work due some operational safety and security reasons. For any stoppage of work for such reasons no claim whatsoever will not be considered.

23.6 Any compensation arising out of the job carried out by the successful bidder whether related to pollution, Safety or Health will be paid by the successful bidder only.

23.7 Any compensation arising due to accident of the successful bidder's personnel while carrying out the job, will be payable by the successful bidder.

23.8 The successful bidder shall have to report all incidents including near miss to Installation Manager/ departmental representative of the concerned department of OIL.

23.9 In case the successful bidder is found non-compliant of HSE laws as required, the company will have the right for directing the successful bidder to take action to comply with the requirements, and for further non-compliance, the successful bidder will be penalized as per prevailing relevant Acts/ Rules/ Regulations.

23.10 When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE measures, Company will have the right to direct the successful bidder to cease work until the non-compliance is corrected.

23.11 All safety gears like safety boots, helmets, safety belts, hand gloves, safety goggles, gas masks etc. required for carrying the job in a safe manner shall be arranged by the successful bidder.

23.12 CLEARANCE OF SITE: - As a part of the job, the successful bidder shall completely remove all the temporary/ disposable materials if needed while execution of work or after completion of work at his own cost and dispose off the same as directed by Engineer-in-Charge.

23.13 The successful bidder shall maintain first aid facilities for its employees. All critical industrial injuries shall be reported promptly to Oil India Limited, and a copy of the successful bidder's report covering each personal injury requiring the attention of a physician shall be furnished to the Oil India Limited.

23.14 If the company arranges any safety class / training for the working personnel at site (company employee, contractor worker, etc.) the contractor will not have any objection to any such training.

23.15 The contractor/supervisor shall arrange daily tool box meetings and maintain records accordingly.

23.16 The Contractor shall prepare written Safe Operating Procedures (SOP) for the works to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them. The SOPs should clearly state the risk arising to men, machineries & material from the mining operation / operations to be done by the contractor and how it is to be managed. Before adoption, same to be approved by OIL.

23.17 The contractor shall keep the SOP up to date and shall provide a copy of the set of SOP to OIL for record.

24.0 INSPECTION AND TESTING

24.1 Factory Acceptance Test (FAT):

24.1.1 OIL reserves the right to involve and satisfy itself at each and every stage of testing.

24.1.2 Comprehensive hardware tests shall be carried out as part of bidder's QA/QC procedure. The test reports shall be forwarded to OIL.

24.1.3 Before the system is delivered to the site, satisfactory performance of the entire system shall be demonstrated. OIL shall depute minimum two persons for witnessing the FAT. The system shall simulate the final onsite configuration as closely as possible.

24.1.4 The successful bidder shall intimate OIL atleast 60 days prior to FAT for deputing OIL's personnel, cost of travel, accommodation and other expenses of OIL's inspection team will be borne by OIL.

24.1.5 The tests undertaken shall demonstrate that each of the following requirement has been fulfilled:

- The system is tested as an integrated system as far as possible.
- The hardware and software requirements are fulfilled

- All tests are documented in a checklist fashion
- The system is fully proven and ready for service.

25.0 Detailed test schedules, including at least the tests listed below, shall be submitted for the Company's approval one month before the testing. The Bidder shall have a technician and test equipment available full time during testing.

26.0 The following minimum activities shall be part of the Factory Acceptance Test in addition to any tests recommended by the bidder:

- Inspection of equipment and BOM verification
- Checking the equipment against GA drawing.
- Checking of panel wiring including ferrules.
- Functional tests, including but not limited to:
    1) Control panel functions
    2) Loop test
    3) Operation of power supplies
    4) Diagnostic test, including self-test facilities
    5) System and process alarms
- Application logic test along with HMI/Display facility functionality test
- System responsiveness (e.g.: scan time, alarm discrimination, logging and screen updates)
- Spare capacity verification
- Communication check of the supplied controller through LAN and cellular network. Additionally Modbus communication shall be demonstrated using mod scan.

27.0 Site Acceptance Test (SAT):

27.1 SAT shall be started only after satisfactory performance of loop checking and verification of records and closing of FAT punch-points.

27.2 Site acceptance tests shall be carried out in presence of OIL's representative

27.3 Bidder shall carry out following tests as minimum as part of SAT:

- Hardware verification as per final Bill of material.
- Visual & Mechanical inspection for proper workmanship, identification, ferruling, name plates etc.
- System configuration as per approved configuration diagram / scheme.
- Demonstration of all system diagnostics.
- Testing of all operational functionalities including alarm and trip logic function.
- System performance test.

- Communications check of the all the supplied items including controllers and remote access facility.

28.0 OIL will finally witness successful uninterrupted operation of the integrated system for the duration of minimum 72 hours for each panel for the operation of respective gas compressor units. Bidder's personnel shall be present during the test. Any malfunctioning of the system components (supplied under this contract) shall be rectified free of cost .Once the failure in the control panel is detected, the test shall start all over again from the beginning. OIL shall take over the system for regular operation once the Site Acceptance Test is completed successfully.

29.0 TRAINING

29.1 Following free of cost training program shall be organized by Bidder at OEM location. If the location for FAT and training is the same then the FAT and training shall be combined for OIL Instrumentation Engineers on maintenance of the control system:

- Training shall be imparted for minimum 04 Engineers.
- Training duration shall be of minimum 10 days.
- Hands on training on simulator systems to maintenance engineer to enable them to operate the units in safe and efficient manner.
- Hands on training on the software features of the Programmable/configurable electronic logic controller for ease of maintenance troubleshooting and seamless operation.
- Hands on training on programming/configuration of Programmable/configurable electronic logic controller for the ease of maintenance.
- Training on the hardware features of the supplied control system.
- The successful bidder shall intimate OIL atleast 60 days prior to start of training for deputing OIL's personnel, cost of travel, accommodation and other expenses of OIL's team will be borne by OIL.
- Training manuals shall be provided to each participant in hard copy and soft copy.

29.2 The successful bidder shall provide on-site free of cost training of 2 days on the operation of the units to operation and maintenance engineers after successful commissioning of the units.

30.0 Documents to be submitted by bidder for Review/ approval /information to OIL:

30.1 The review/approval by OIL does not signify compliance with the purchase order. Review/approval by OIL is for quality assurance purpose only.

30.2 It is bidder's sole responsibility to comply with the requirement of this tender and applicable codes etc.

30.3 Documents to be submitted during detailed Engineering for OIL approval:

a) General arrangement drawing of the panel.
b) Interface drawing for third party connections.
c) Cable schedule.
d) Instrument hookup drawing.
e) Instrument data-sheet.
f) Electrical wiring drawing.
g) Load calculation for the complete system.
h) Instrumentation Loop diagram.
i) Operation & Control philosophy and Logic details of start-up, sequence, interlock, safety shutdown, alarm, control & monitoring.
j) Cause and effect matrix.
k) Instrument index.
l) Earth pit drawing
m) I/O configuration details
n) FAT & SAT procedure
o) Alarm and trip schedules.

30.4 The following documents shall be submitted after successful commissioning as as-built documents. These documents shall incorporate all the changes made during commissioning. 01 (one) set of hard copy and 01(one) set of softcopy shall be provided for each control panel.

a) General arrangement drawing.
b) Interface drawing for third party connections.
c) Cable schedule.
d) Instrument hookup drawing.
e) Instrument data-sheet.
f) Electrical wiring drawing.
g) Instrumentation Loop diagram.
h) Operation & Control philosophy and Logic details of start-up, sequence, interlock, safety shutdown, alarm, control & monitoring.
i) Cause and effect matrix.
j) Instrument index.
k) Earth pit drawing
l) Certification for hazardous area usage compliance as per section 19.
m) Data sheets for all instruments.
n) Operation and Maintenance Manual.
o) Alarms and trip schedules.

Annexure-BB

BID EVALUATION CRITERIA (BEC)/BID REJECTION CRITERIA (BRC)

The bids shall conform to the specifications and terms & conditions given in the Tender. Bids shall be rejected in case the items offered do not conform to the required parameters stipulated in the technical specifications and to the relevant international/national standards wherever stipulated. Notwithstanding the general conformity of the bids to the stipulated specifications and terms & conditions, the following requirements must be particularly met by the bidders, without which the offer shall be considered as non-responsive and rejected:

BID REJECTION CRITERIA (BRC):

A1: TECHNICAL CRITERIA:

1.0 BIDDERS' QUALIFYING CRITERIA:

1.1 The bidder shall be an Original Equipment Manufacturer (OEM) of the tendered item(s)
OR
The bidder shall be authorized agent / dealer / distributor / supply house of an OEM of the tendered item(s).

Note: a) Bidder(s) other than OEM must submit a valid Authorization letter and back-up warranty from the manufacturer. The Authorization and back-up warranty letter duly sealed & signed by the Manufacturer on their official letterhead must be submitted along with the technical bid.

b) The Sole Selling Agent/Dealer/Distributor/Supply House shall categorically confirm in their technical bid that there will be no change of the proposed OEM after submission of the bid.

2.0 BIDDERS' EXPERIENCE:

2.1 IN CASE THE BIDDER IS A MANUFACTURER (OEM):

2.1.1 <u>OEM proposing for supply and services by themselves:</u>

The OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for Supply and Installation & Commissioning of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per Para 2.3

2.1.2 <u>OEM proposing for supply by themselves and services by their authorized service provider/ distributor/ sole selling agent/ supply house:</u>

A) The OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for "Supply" or "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3.1(a) for "Supply" or 2.3.1 (a) & (b) for " Supply and Installation & Commissioning); whichever is applicable.

B) The OEM authorized service provider/ distributor / sole selling agent/ supply house must have experience of successfully executing one (1) order/contract for Installation & Commissioning of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender.

Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3.1 (b) alongwith relevant PO copy.

2.2 **IN CASE THE BIDDER is a Sole Selling Agent/Dealer/Distributor/Supply House of the Original Equipment Manufacturer (OEM)**:

The following criteria shall be met by the Bidder and the OEM:

i) Their proposed OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3.

ii) Additionally, the bidder as a sole selling agent/ dealer/ distributor/ supply house must have experience of successfully executing one (1) order for "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3

2.3 NOTES TO BIDDER REGARDING EXPERIENCE CRITERIA:

2.3.1 The following documentary evidences to substantiate above experience records (2.1 and 2.2, as applicable) of the Bidder must be submitted along with the technical bid, failing which the Bid shall be treated as incomplete and rejected:

(a) Copy of Purchase order/contract awarded by Client

(b) Any one or combination of the following documents that confirms the successful execution of the purchase order / contract-

True copies of Original Signed and sealed Completion report/performance certificate from the clients (on Client's/User's official letter head with signature & stamp).

OR

Any one or combination of the following documents that confirms the successful execution of the purchase order / contract –

- Completion report / performance certificate from the clients,
- Any other documentary evidence that can substantiate the successful execution of the Purchase Order / contract cited above.

2.3.2 The date of purchase order/contract need not be within ten (10) years preceding the original bid closing date of the Tender, but execution/ supply of required quantity must be within ten (10) years preceding the original bid closing date of this tender.

2.3.3 In case of extension to the scheduled Bid Closing date of this tender, if any, the Original scheduled Bid closing Date shall be considered for evaluation of Bids.

2.3.5 The purchase order/ contract must bear the purchase order number/ contract number which clearly indicate the scope of work and technical specifications of the item.

2.3.6 The experience of the bidder's sister concern/ subsidiary shall not be considered for evaluation.

A2: FINANCIAL CRITERIA

1.0 **Annual Turnover:** The bidder shall have an annual financial turnover of minimum **INR 2,27,41,747.50** during any of the preceding 03 (three) financial years reckoned from the original bid closing date, irrespective of whether their bid is for all the tendered items or not.

2.0 "**Net Worth**" of the bidder must be positive for the financial/accounting year just proceeding to the original Bid Closing Date of the Tender **(i.e., Year 2020-21).**

3.0 Considering the time required for preparation of Financial Statements, if the last date of preceding financial/accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial/accounting year are not available with the bidder, then the financial turnover of the previous three financial/accounting years excluding the preceding financial/ accounting year will be considered. In such cases, the Net worth of the previous financial/accounting year excluding the preceding financial/ accounting year will be considered. However, the bidder has to submit an affidavit/ undertaking **(ref. Proforma-6)** certifying that 'the balance sheet/Financial Statements for the financial year **2020-21** has actually not been audited so far'.

Note:

a) For proof of Net worth any one of the following document must be submitted along with the technical bid:-

i) A certificate issued by a practicing Chartered / Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual Turnover & Net worth as per format prescribed in **Proforma-7**.
OR

ii) Audited Balance Sheet along with Profit & Loss account.

b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/ State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.

4.0 In case the Audited Balance Sheet and Profit & Loss Account submitted along with the bid are in currencies other than INR or US$, then the bidder shall have to convert the figures in equivalent INR or US$ considering the prevailing conversion rate on the date of Balance Sheet and Profit & Loss Account. A CA certificate is to be submitted by the bidder regarding converted figures in equivalent INR or US$.

5.0 In case the Bidder is subsidiary company (should be 100% owned subsidiary of the parent/ultimate parent/holding company) who does not meet financial criteria by itself and submit its bid based on the strength of parent/ ultimate parent/ holding company, then following documents need to be submitted:

i) Turnover of the parent/ ultimate parent/ holding company should be in line with Para 1.0 above.

ii) Net Worth of the parent/ultimate parent/ holding company should be positive in line with Para 2.0 above.

iii) Corporate Guarantee (as per Proforma-8) on parent / ultimate parent/ holding company's company letter head signed by an authorized official undertaking that they would financially support their wholly owned subsidiary company for executing the project/ job in case the same is awarded to them.

iv) Document of subsidiary company being 100% owned subsidiary of the parent/ ultimate parent/ holding company.

Annexure-CC

GENERAL NOTES TO BIDDERS

1.0 Delivery Schedule:
Time frame for project completion is to be divided into two parts.
(i)The first part is for supply of items which has to be completed within 09 (nine) months from the date of issue of Purchased Order (PO).
(ii)The second part is for Installation and Commissioning which has to be completed within 03 (three) months of intimation of site readiness.

2.0 Bidders shall submit their offer mentioning pointwise compliance/noncompliance to all the terms & conditions, BEC/BRC, Specifications etc. Any deviation(s) from the tender terms & conditions, BEC/BRC, Specifications etc. should be clearly highlighted specifying justification in support of deviation.

3.0 The Bidder to submit following Technical Evaluation Sheet & Appendices along with technical bid -

Annexure -A: Bid Evaluation Matrix (Bid Rejection Criteria)
Appendix – B: Commercial Checklist
Annexure-2: Technical Checksheet
Annexure-3: Bill of Materials

4.0 OIL shall be entering into an Integrity Pact, **if applicable** with the bidders as per format enclosed vide **PROFORMA - 4** of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact have been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

OIL's Independent External Monitors at present are as under:

Shri Sutanu Behuria, IAS (Retd.),
e-mail ID : *sutanu2911@gmaiI.com*

Shri Om Prakash Singh, IPS (Retd.),
Former DGP, Uttar Pradesh
e-mail: *Ops2020@rediffmail.com*

Shri Rudhra Gangadharan, IAS (Retd.),
Ex-Secretary, Ministry of Agriculture
e-mail id : *rudhra.gangadharan@gmail.com*

5.0 **Categorisation and various criteria applicable to MSE bidders shall be guided by the Gazette Notification No. CG-DL-E-26062020-220191 dated 26.06.2020 issued by MINISTRY OF MICRO, SMALL AND MEDIUM ENTERPRISE.**

The bidder claiming as MSE status (MSE-General, MSE-SC/ST, MSE -Woman) against this tender has to submit the following documents for availing the benefits applicable to MSEs:

i. **Udyam Registration Number with Udyam Registration Certificate.**

Note: ***In case bidding MSE is owned by Schedule Caste or Schedule Tribe entrepreneur or Woman Entrepreneur, valid documentary evidence issued by the agency who has registered the bidder as MSE owned by SC/ST entrepreneur/ Woman Entrepreneurs should also be enclosed.***

6.0 **TAX COLLECTIBLE AT SOURCE (TCS):**

Tax Collectible at Source (TCS) applicable under the Income-tax Law and charged by the SUPPLIER shall also be payable by OIL along with consideration for procurement of goods/materials/ equipment. If TCS is collected by the SUPPLIER, a TCS certificate in prescribed Form shall be issued by the SUPPLIER to OIL within the statutory time limit.

Payment towards applicable TCS u/s 206C (IH) of Income Tax Act, 1961 will be made to the supplier provided they are claiming it in their invoice and on submission of following undertaking along with the invoice stating that:

a. TCS is applicable on supply of goods invoiced to OIL as turnover of the supplier in previous year was more than Rs. 10 Cr. and
b. Total supply of goods to OIL in FY …….. (As applicable) exceeds Rs. 50 Lakh and
c. TCS as charged in the invoice has already been deposited (duly indicating the details such as challan No. and date) or would be deposited with Exchequer on or before the due date and
d. TCS certificate as provided in the Income Tax Act will be issued to OIL in time.

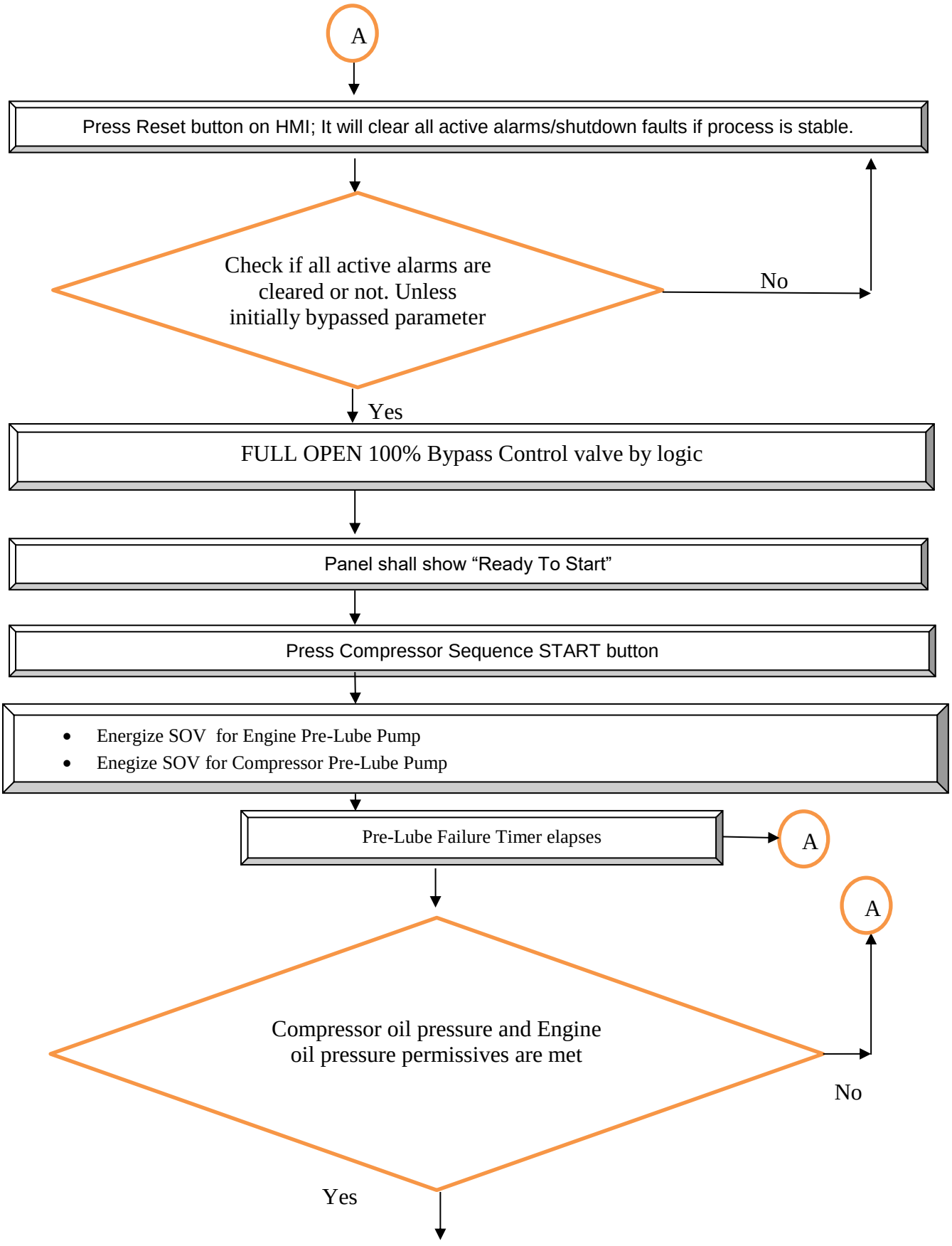
However, Performance Security deposit will be released only after the TCS certificate for the amount of tax collected is provided to OIL. Supplier will extend the performance bank guarantee (PBG), wherever required, till the receipt of TCS certificate or else the same will be forfeited to the extent of amount of TCS, if all other conditions of Purchase order are fulfilled.

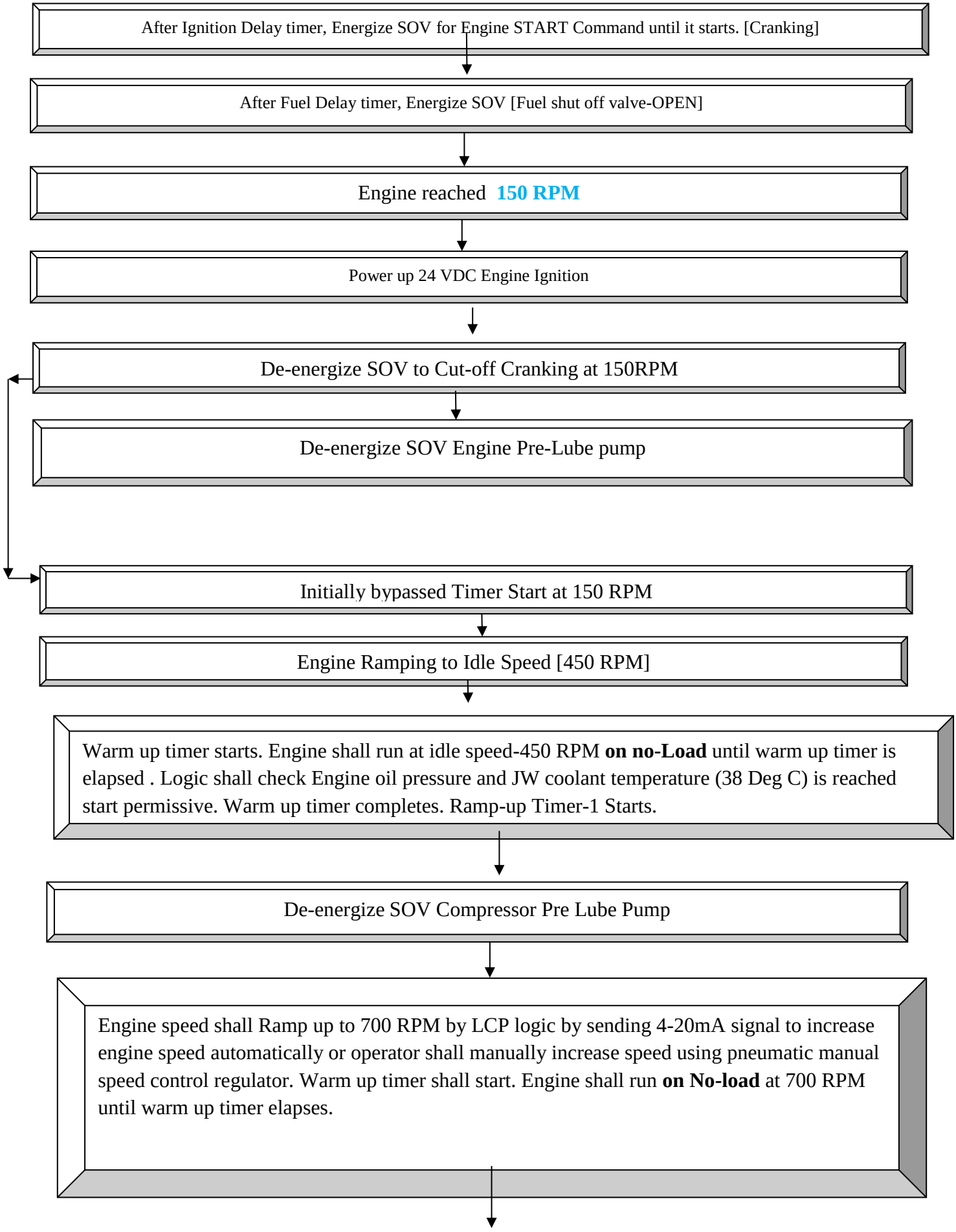
The above payment condition is applicable only for release of TCS amount charged by supplier u/s 206C (I H) of Income tax Act, 1961.

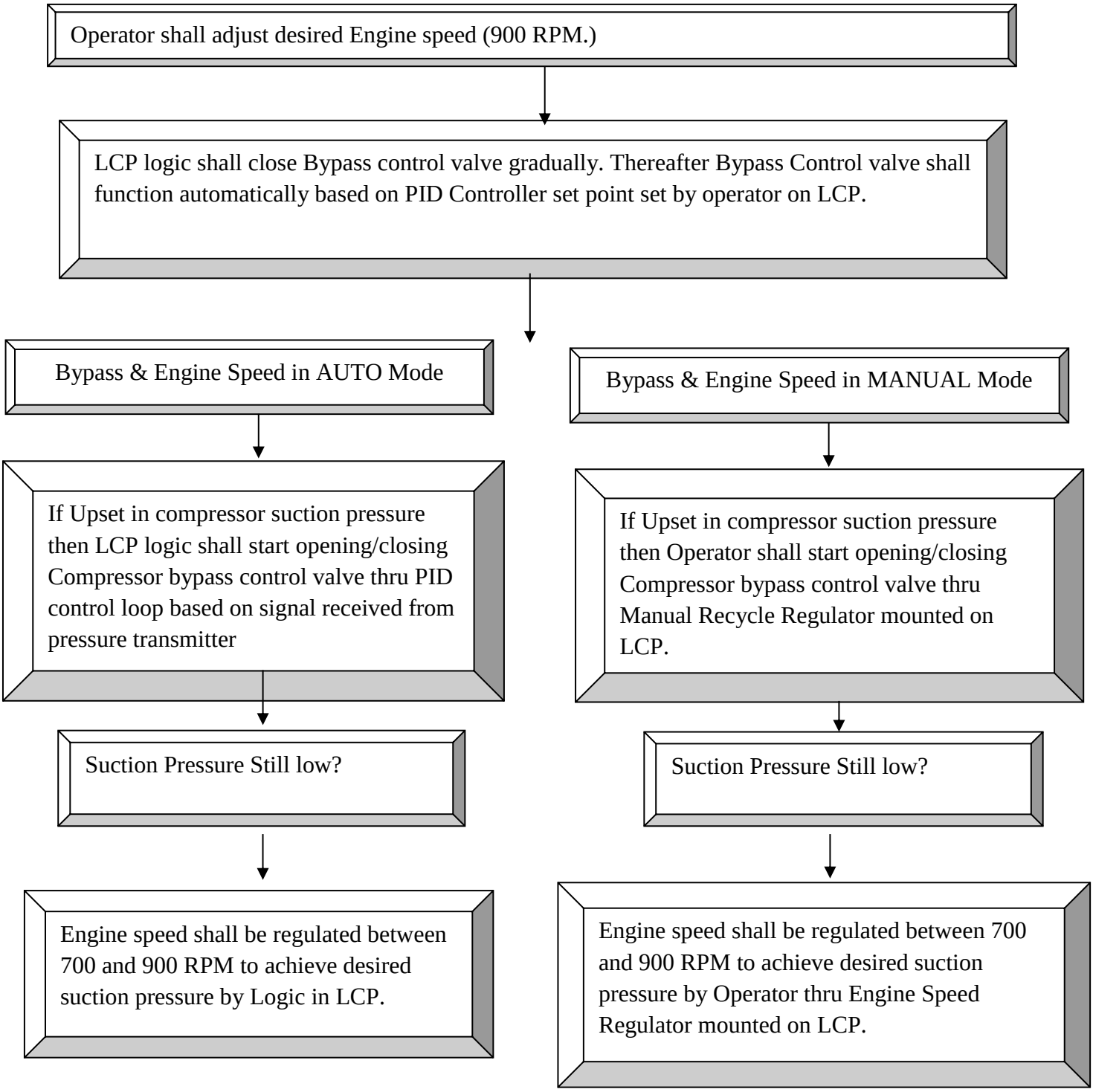
7.0 At any time prior to the deadline for submission of bids, the Company may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the tender Documents through issuance of Corrigendum(s)/Addendum(s). Bidders are expected to take the Corrigendum(s)/ Addendum(s) into account in preparation and submission of their bid. No separate intimation for Corrigendum(s)/Addendum(s) published by OIL shall be sent to the Bidders.

Annexure- 1 Operating Philosophy

START UP SEQUENCE

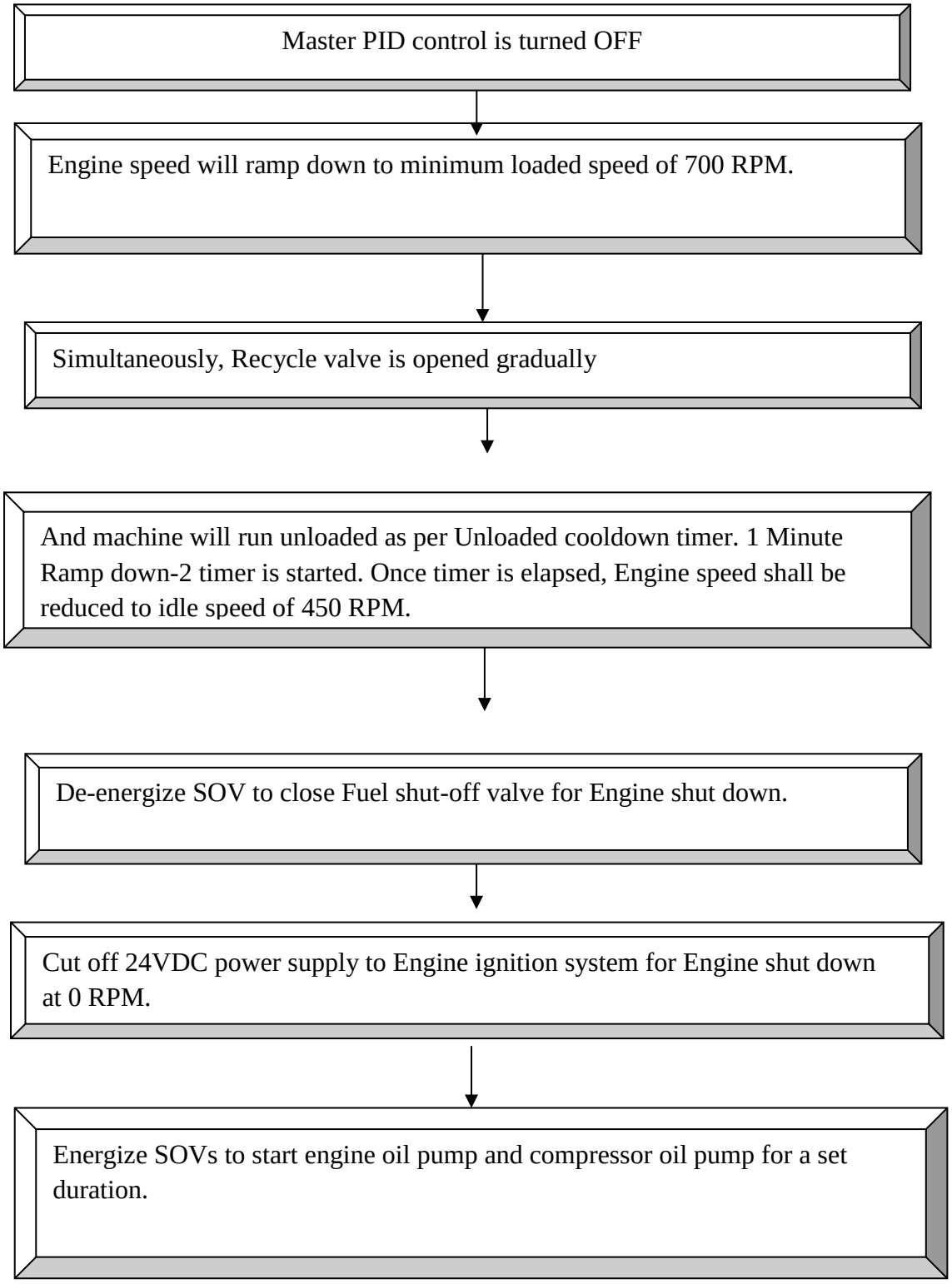



After Ignition Delay timer, Energize SOV for Engine START Command until it starts. [Cranking]
After Fuel Delay timer, Energize SOV [Fuel shut off valve-OPEN]
Engine reached 150 RPM
Power up 24 VDC Engine Ignition
De-energize SOV to Cut-off Cranking at 150RPM
De-energize SOV Engine Pre-Lube pump
Initially bypassed Timer Start at 150 RPM
Engine Ramping to Idle Speed [450 RPM]
Warm up timer starts. Engine shall run at idle speed-450 RPM on no-Load until warm up timer is elapsed . Logic shall check Engine oil pressure and JW coolant temperature (38 Deg C) is reached start permissive. Warm up timer completes. Ramp-up Timer-1 Starts.
De-energize SOV Compressor Pre Lube Pump
Engine speed shall Ramp up to 700 RPM by LCP logic by sending 4-20mA signal to increase engine speed automatically or operator shall manually increase speed using pneumatic manual speed control regulator. Warm up timer shall start. Engine shall run on No-load at 700 RPM until warm up timer elapses.


Operator shall adjust desired Engine speed (900 RPM.)
LCP logic shall close Bypass control valve gradually. Thereafter Bypass Control valve shall function automatically based on PID Controller set point set by operator on LCP.
Bypass & Engine Speed in AUTO Mode
If Upset in compressor suction pressure then LCP logic shall start opening/closing Compressor bypass control valve thru PID control loop based on signal received from pressure transmitter
Suction Pressure Still low?
Engine speed shall be regulated between 700 and 900 RPM to achieve desired suction pressure by Logic in LCP.
Bypass & Engine Speed in MANUAL Mode
If Upset in compressor suction pressure then Operator shall start opening/closing Compressor bypass control valve thru Manual Recycle Regulator mounted on LCP.
Suction Pressure Still low?
Engine speed shall be regulated between 700 and 900 RPM to achieve desired suction pressure by Operator thru Engine Speed Regulator mounted on LCP.

AUTO COOLDOWN SEQUENCE

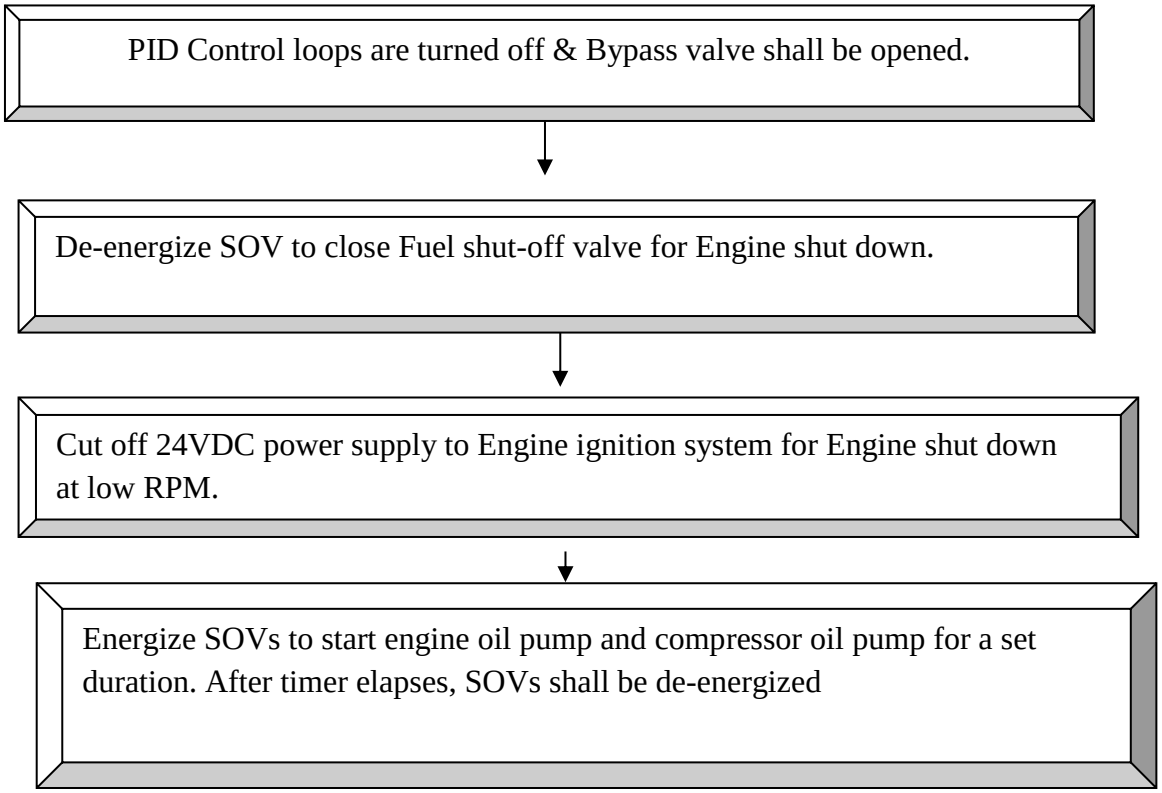
The Auto Cooldown sequence is used to gradually unload the compressor package and let it run unloaded for several minutes prior to shutting down the package. It is initiated by pushing the Cooldown Stop button.



SHUTDOWN/ STOP SEQUENCE/ TRIP

- Compressor can be stopped by pressing Normal stop - “Engine stop” soft button on LCP.
- Compressor shall be tripped by Process trip - Due to any process parameter upset indicated in P & ID (HH/LL trips).

LCP logic shall perform following activities in case of any compressor stop/trip



In any of emergency stop, LCP shall generate Closing command to Fuel shut-off valve SOV & Cut off 24VDC power supply ignition system at same time.

Annexure-2 Technical Checksheet			
Specification Number	Description	**Relevant Location of their Bid to support the remarks / compliance (Reference of Document name / Serial number / Page number of bid for documentary evidence)**	**BIDDER'S RESPONSE (Complied / Not Complied / Deviation/ Not Applicable)**
3.0	**ENVIRONMENTAL CONDITIONS** The general climatic conditions are as stated below: • Maximum Ambient Temperature 42 DegC • Minimum Ambient Temperature 7 DegC • Relative Humidity • At 21 Deg C : 100 % • At 32 Deg C : 95% • At 41 Deg C: 70% • Elevation Above Mean Sea Level : 170 metres • Seismic Zone: V • Yearly Average Rainfall : 300 cm		
4.0	**DETAILS OF COMPRESSOR UNITS** The operating philosophy of the compressor will be as per attached Annexure-1 for only reference purpose. Final operating philosophy will be fixed during detailed engineering.		

5.0	**SCOPE OF OIL INDIA LIMITED SUPPLY** OIL shall provide the following: a) **Electrical Power Supply:** • For Control Panel: Rated voltage : 230 V-AC (± 10%), single (1) phase, Rated frequency : 50 Hz (± 5 Hz)will be available. • Work site illumination and any other utility power. • Bidder shall lay cable from the existing electrical feeder to the UPS. Bidder to also lay power cable from UPS to control panel. (total approximately 200 metres for each panel) b) **Instrument Air:** • Operating Pressure : 6 - 9 kg/cm2(g), Temperature : 65°C Maximum • Air supply is available near the existing panel. If any regulator, air header, isolation valves or tubing and fittings are required, then the bidder has to provide the same.		
6.0 Scope of Supply and Services			
6.1	Job envisaged is the replacement of the existing pneumatic control panel for natural gas compressor and associated pneumatic field instruments with electronic control panel for natural gas compressor and associated field instruments.		
6.2	Bidder shall be responsible for all types of erection, electrical, instrumentation work including, but not limited to the following:Complete design, detailed engineering, preparation of drawings / documents, sizing, selection, procurement, installation and commissioning of the panel with its accessories, field instruments and controls etc., tubing, dressing , supports, cabling, testing, calibration, loop checking, arranging all the various types of equipment required for testing and calibration.		
6.3	All equipment supplied shall be from reputed manufacturers and be field proven, both with respect to design and materials.		

6.4	Bidder shall provide document and clearly specify the provisions and schemes which they are proposing for control panels, power supply, HMI/ Display facility and UPS (Uninterrupted power supply) distribution scheme etc. Bidder shall take approval during detailed engineering from OIL for the documents and schemes provided and only after the receipt of approval shall proceed further.		
6.5	Bidder shall be responsible for co-ordination with other agencies like OEMs for various instrument/Equipment /devices etc. which are under their scope of supply.		
6.6	Proper selection of various component /instruments/item should be carried out for IEC Zone-2 Gr. IIA/IIB/IIC T3		
6.7	Uniformity in selection should be maintained for makes of similar Instrument and their accessories for operational convenience, ease of maintenance and spare parts inventory point of view.		
6.8	If there is any conflict in respect of specification, data sheets, related standards, code etc., bidder shall refer the matter to OIL for clarification and only after obtaining the same they should proceed further.		
6.9	The system designed shall be complete in every aspect and sufficient for the safe, efficient and easy operation, start up and shut down of the Gas Compressor unit.		
6.10	All standards, code of practices to be followed up shall be of the latest edition.		
6.11	Materials of construction of item to be supplied shall be consistent with temperature, pressure, corrosion conditions and other process requirement.		
7.0 Control Panel Philosophy			
7.1	The design of the control panel shall be of Programmable/configurable electronic logic controller (Microprocessor based) based, designed for Engine Driven Reciprocating Gas Compressor packages.		

7.2	The control panel shall be suitable for use in IEC Zone-2 Gr. IIA/IIB/IIC T3		
7.3	Inside the control panel, the use of FLP junction box is not acceptable.		
7.4	Purged and pressurized control panel is not acceptable.		
7.5	The panel shall be so designed that minimum time is taken for the maintenance crew to open the panel door without having to remove any nuts and bolts.		
7.6	The control panel shall be equipped with a Human Machine Interface (HMI) unit which shall be easily accessible by the operator. The fault functions shall be both visually (in the control panel HMI/ Display facility) and audibly indicated and shall remain 'ON' until manual reset. All the process parameters shall be displayed on an HMI/ Display facility on the panel. The HMI shall be accessible to the user without opening the control panel.		
7.7	It will have sequence starting system to ensure that all functions associated with starting operation are performed in correct sequence such as pre lube, warmup, loading, post lube etc. The startup and shutdown shall be by means of hardwired switch on the control panel. Provision shall also be incorporated for emergency shutdown of the compressor unit through a hardwired push button. Additionally the unit shall also have the provision for startup and shutdown from HMI through software button.		
7.8	Bidder shall be required to supply all relevant hardware, controller programming along with software for modification, upload & download of the control program with licenses as required. The required licenses shall be with lifetime validity. Panels to be supplied with Controller hardware installed and pre-wired within control panel.		
7.9	It will be in the scope of the Bidder to Design, develop and configure the Controller programming and upload the same in proposed Controller to incorporate all safety interlock for the process, start-up and shutdown sequences for compressors including the erection and commissioning of the new control panels (which will be located at the place of existing pneumatic control panel on the compressor skid).		

7.10	The panel will have the provision to terminate the field cables from field instruments/equipment through double compression FLP cable gland and cabling & termination job will be in bidder's scope.		
7.11	After erection of the panel (in place of existing panel) no welding /cutting job will be allowed near the compressor skid under the compressor shed. Bidder shall complete all such required job beforehand.		
7.12	Bidders shall be required to consider all Input devices and output devices for the configuration of Controller hardware to meet control requirements in line with existing control philosophy of the unit. In case any extra input or output devices are felt necessary to be included and configured within the system for the safe and reliable operation of the natural gas compressor, the same shall be categorically mentioned in the bid document and the cost shall be included in the bid.		
7.13	The control system should operate on fail safe principle.		
7.14	Distribution of power supply for the supplied field instruments shall be from the control panel itself. Bidder to consider the same during the design of the panel.Power supply system shall have adequate capacity to accommodate additional input/output (I/O) signals to load up to 100% of I/O capacity		
7.15	Bidder shall provide 10% spare I/O channels for each type of I/O and the same shall be wired upto the terminal block.		
7.16	Field instruments shall be connected to the control panel through optical isolators.		
7.17	Control panel shall be designed such that user can access the control program and HMI remotely through both LAN and cellular internet.		
7.18	Normal operation of the natural gas compressor shall be through the HMI on the control panel.		

7.19	There shall be the provision for audio visual alarms. Audible alarm shall be through a suitably loud hooter. And visual alarm shall be through a flasher.		
7.20	There shall be facility for historical trends. Also, event logging shall be available. It shall be possible to store historical trends of at least 40 data points for minimum 60 days at 5 seconds sampling time.		
7.21	Control panel software shall have protection against un-authorized access. There shall be atleast two types of access levels – Operator Access and Engineering Access protected by user configurable password. Under operator access only viewing and operating privilege shall be granted. Under engineering access all the facility granted under normal access and additionally the permission to change parameters and set points, alarms limits shall be granted. Additionally under engineering access the permission for enabling and disabling alarms shall be provided.		
7.22	There shall be facility for auto & manual selection of bypass /recycle control PID loop from the panel.		
7.23	There shall be a provision for timer based operation of the 1^{st} stage and 2^{nd} stage scrubber dump valves through an arrangement of timer for each stage implemented in the controller and solenoid valves.		
7.24	There shall be facility for auto & manual selection of speed control PID loop from the panel.		
7.25	There shall be facility for manual pneumatic engine speed control through a precision pressure regulator and with a panel mounted dial gauge for rpm.There shall be a selector switch to choose between pneumatic engine speed control and electronic speed control.		
7.26	Alarm set point, trip set point, timer set time etc.shall be user configurable through HMI.		

7.27	Compressor speed shall be measured and displayed on the HMI in rpm.		
8.0 FIELD INSTRUMENTS PHILOSPHY			
8.1	All electronic field instruments shall operate on 24 volts DC. When no suitable 24VDC device is available the bidder shall take approval from OIL during detailed engineering stage to supply a field device of different operating voltage.		
8.2	All electronic instruments shall be immune to Radio frequency interference		
8.3	Pressure reading shall be routed through transmitter to the control panel. All transmitters shall be arranged near or inside the control panel to save space.		
8.4	Bidder shall provide thermocouple/ RTD for temperature measurement which shall be routed to the control panel directly to temperature IO card.Additionally it shall be in the scope of bidder to lay 14 core K-type thermocouple extension cable (approximately 50 metres in length) from engine temperature measurement junction box to control panel for configuring the engine temperature readings in the control panel.		
8.5	Gauges for important parameters shall be provided and the same shall be arranged such that operator can look at all the readings at one place. The gauges shall be arranged such that the gauges are placed in the same area, facing the same direction for the ease of operator.		
8.6	RPM sensor for speed measurement shall be provided which shall be of non contact type for displaying the speed in RPM.		
8.7	I/P convertor shall be provided for operating bypass/ recycle control valve.		
8.8	I/P convertor shall be provided for automatic speed control.		
8.9	Air filter regulators shall be provided wherever necessary to control the pressure of instrument air for control purposes.		
8.10	Level switches shall be provided for compressor oil level application, engine oil level application, 1st stage scrubber level application and 2nd stage scrubber level application.		

8.11	Level switches of Murphy Make LM301-Ex shall be supplied for compressor oil and engine oil low level tripping application.		
8.12	Vibration transmitter shall be used to measure the vibration and the same shall be installed using glue pad if no other viable method for installation is found.		
8.13	Solenoid operated valves shall be provided to start engine pre-lube pump, compressor pre-lube pump, air starter, fuel shut off valve, scrubber dump valves. Additionally solenoid operated valves shall be provided to cut off air supply to the I/P converters.		
8.14	SS tubing and SS fittings shall be used of Swagelok, Parker or Sandvik make		
9.0 Cabling Philosophy			
9.1	Signal /multi core cables shall be armoured and stranded copper conductor of minimum 1.0 Sq.mm or higher.		
9.2	Power cables shall be three core armoured cables. It will be of stranded copper conductor of minimum 1.5 Sq.mm or higher according to power loading calculations.		
9.3	Control cables for Solenoid Operated Valve shall be three core armoured cables. It will be of stranded copper conductor of minimum 1.5 Sq.mm or higher.		
9.4	All the above ground cables shall be laid in galvanized metallic cable trays. Underground cables shall be laid with proper sand and brick back filling with cable markers.		
9.5	Entry of the cables to the operator's room/control room terminating in the control panel should be neat and exposed portion should be routed through cable tray mounted on wall.		
9.6	All cables shall have tags plates at source and destination ends identifying the cable.		
9.7	All cable terminations shall have ferrules. All ferrules shall follow cross ferruling identification philosophy in which Source termination point and Destination termination point shall be shown.		

9.8	Power cables shall be laid such that there shall not be any electromagnetic interference with signal cables.		
10.0 Junction Box Specification			
10.1	Junction boxes shall be weather-proof to IP65. Relevant certificate has to be furnished by the bidder.		
10.2	The junction boxes shall be provided with sufficient number of terminals to terminate all the pairs of multi-cable (including spare pairs) and shields of individual pairs as applicable.		
10.3	Junction boxes shall have separate external terminal for accommodating earthing wires up to 10sqmm.		
10.4	Unused cable gland entries should be properly sealed with suitable SS blind plugs as per safety standards for Hazardous area applications.		
10.5	Junction boxes shall have unique tag number and the same shall be affixed on the junction box with a tag plate.		
11.0 Cable Glands			
11.1	All cable glands shall be double compression type, nickel-plated and weather proof and flameproof suitable for installation in an area classification of IEC Zone II Gas Group IIA/IIB/IIC T3.		
11.2	The cable glands shall be provided with PVC hood.		
11.3	Cable glands shall be suitable for cable dimensions with +/- 2mm tolerance.		
11.4	The plugs and adaptors shall also be weather proof and flameproof suitable for installation in an area classification of IEC Zone II Gas Group IIA/IIB/IIC T3		
12.0 Earthing System			
12.1	Installation & commissioning of the necessary earthing system for control panel and other instruments shall be under scope of bidders. The earthing system shall be of readymade		

	maintenance free CPRI approved chemical earthing system with 50 mm diameter 3.00 Metres length corrosion free G.I. pipe Electrode complete with backfill compound Minerals 50 Kg and Earth pit cover including excavation of earth pit and construction brick earth chamber including plastering both inner & outer surface of brick wall as specified and directed by Engineer in charge. Size of brick chamber shall be 2 feet x 2 feet.		
12.2	All signal circuits shall be grounded as per the instrument manufacturer's recommendations and good practices.		
12.3	All circuits must be grounded at one point only.		
12.4	All instrument cases and housing capable of carrying current shall be grounded to the panel structure. The panel structure will in turn be grounded to main ground.		
13.0 Communication Philosophy			
13.1	Bidder shall design the communication system such that user can access the controller remotely through LAN and cellular network.		
13.2	Bidder shall supply one laptop with the entire lot suitable for use in IEC Zone-2 Gr. IIA/IIB/IIC T3 for local configuration of the controller and HMI along with necessary cables and peripherals as needed for communicating the laptop with HMI/ controller.		
13.3	Bidder shall supply lifetime valid software's required for configuration of the controller including editing control logic, configuration of the HMI including editing the supplied graphics and configuration of any other component of the supplied control system that requires configuration.		
13.4	Bidder shall keep provision for communication of the local control panels with existing SCADA through Modbus RS485.		
14.0 UPS and Power Philosphy			
14.1	UPS of 4 hours back up which is capable of supplying power to two identical control panels and associated field instruments shall be supplied.		

<table>
<tr><td>14.2</td><td>Powering the control panel will be through the UPS only.</td><td></td><td></td></tr>
<tr><td>14.3</td><td>The UPS power supply shall be sized to the requirement of the installed load with 20% spare capacity.</td><td></td><td></td></tr>
<tr><td>15.0</td><td>PROGRAMMABLE CONTROLLER INPUTS/ OUTPUTS:

Bidders shall be required to supply minimum Input and output as mentioned under for configuration of the Controller and hardware to be provided to meet control requirements of 1nos. of gas lifter compressor package. In case, any extra input or output devices are felt necessary to be included and configured within the system, the same shall be indicated during detailed engineering without any extra cost to OIL. Even during system pre-commissioning or testing if OIL feels necessary to have trending or real time data logging or monitoring of some other additional process data in the operating system, bidder shall be ready to carry out requisite engineering and configure the same within the system without any extra cost to OIL as long as no additional hardware is necessary for the controller or field devices.

Analog Inputs:
<table>
<tr><th>SL No</th><th>Parameters</th><th>Quantity</th></tr>
<tr><td>1</td><td>Engine Fuel Gas Inlet Pressure</td><td>1 No.</td></tr>
<tr><td>2</td><td>1st Stage Suction Pressure</td><td>1 No.</td></tr>
<tr><td>3</td><td>1st Stage Discharge Pressure</td><td>1 No.</td></tr>
<tr><td>4</td><td>2ndStage Suction Pressure</td><td>1 No.</td></tr>
<tr><td>5</td><td>2ndStage Discharge Pressure</td><td>1 No.</td></tr>
<tr><td>6</td><td>Compressor Oil Pressure</td><td>1 No.</td></tr>
<tr><td>7</td><td>Engine Oil Pressure</td><td>1 No.</td></tr>
<tr><td>8</td><td>Instrument Air Pressure</td><td>1 No.</td></tr>
<tr><td>9</td><td>Cranking Air Pressure</td><td>1 No.</td></tr>
<tr><td>10</td><td>Engine intake manifold pressure right bank</td><td>1 No.</td></tr>
<tr><td>11</td><td>Engine intake manifold pressure left bank</td><td>1 No.</td></tr>
</table></td><td></td><td></td></tr>
</table>

12	Compressor vibration(frame& throws)	**3nos.**
13	Engine vibration	**2 nos.**
14	Cooler vibration	**2 nos.**

ANALOG THERMOCOUPLE INPUT(TYPE-K)

SL No.	Parameter	Quantity
1	ENGINE FUEL GAS INLET TEMPERATURE	**1 No.**
2	1ST STAGE SUCTION TEMPERATURE	**1 No.**
3	1ST STAGE DISCHARGE TEMPERATURE	**1 No.**
4	2ND STAGE SUCTION TEMPERATURE	**1 No.**
5	2ND STAGE DISCHARGE TEMPERATURE	**1 No.**
6	COMPRESSOR OIL TEMPERATURE	**1 No.**
7	ENGINE OIL TEMPERATURE	**1 No.**
8	COMPRESSOR/AUXILLARY JACKET WATER TEMPERATURE	**1 No.**
9	ENGINE JACKET WATER TEMPERATURE	**1 No.**
10	ENGINE INTAKE MANIFOLD RIGHT BANK TEMPERATURE	**1 No.**
11	ENGINE INTAKE MANIFOLD LEFT BANK TEMPERATURE	**1 No.**
12	EXH. TEMPERATURE (for all cylinders)	**Thermocouples are installed. Bidder shall be responsible for cabling of the sensors from junction box to supplied control panel.**
13	EXCESSIVE EXH. TEMPERATURE RIGHT BANK	
14	EXCESSIVE EXH. TEMPERATURE LEFT BANK	

ANALOG OUTPUTS:

SL No	Parameters	Quantity

1	RECYCLE CONTROL (I/P)	**1 No.**
2	SPEED CONTROL (I/P)	**1 No.**

DIGITAL INPUT:

SL No.	Parameters	Quantity
1	EMERGENCY STOP	**1 No.**
2	1ST STAGE SUCTION SCRUBBER LIQUID LEVEL HH	**1 No.**
3	2ND STAGE SUCTION SCRUBBER LIQUID LEVEL HH	**1 No.**
4	COMPRESSOR LUBE OIL NO FLOW	**1 No.**
5	COMPRESSOR LUBE OIL LEVEL LL	**1 No.**
6	ENGINE LUBE OIL LEVEL LL	**1 No.**
7	ENGINE JACKET WATER NO FLOW(DP TYPE) LL	**1 No.**
8	COMPRESSOR JACKET WATER NO FLOW(DP TYPE) LL	**1 No.**
9	1ST STAGE SUCTION PRESSURE HIGH	**1 No.**
10	1ST STAGE SUCTION PRESSURE LOW	**1 No.**
11	1ST STAGE DISCHARGE PRESSURE HIGH	**1 No.**
12	1ST STAGE DISCHARGE PRESSURE LOW	**1 No.**
13	2ND STAGE SUCTION PRESSURE HIGH	**1 No.**
14	2ND STAGE SUCTION PRESSURE LOW	**1 No.**
15	2ND STAGE DISCHARGE PRESSURE HIGH	**1 No.**
16	2ND STAGE DISCHARGE PRESSURE LOW	**1 No.**

DIGITAL OUTPUT:

SL No.	Parameters	Quantity
1	COMPRESSOR PRELUBE	**1 No.**
2	ENGINE PRELUBE	**1 No.**
3	CRANK	**1 No.**
4	IGNITION	**1 No.**
5	FUEL ON	**1 No.**

6	ALARM HORN	**1 No.**
7	UNIT RUN STATUS RELAY	**1 No.**
8	1ST STAGE SCRUBBER DUMP VALVE	**1 No.**
9	2ND STAGE SCRUBBER DUMP VALVE	**1 No.**

FREQUENCY INPUT:

SL No.	Parameter	Quantity
1	**ENGINE RPM**	**1 No.**

16.0 **LIST OF MANUAL GAUGES:**

Analog gauge shall be provided to monitor process parameters of compressor and Engine as given below:

a) Gas suction and discharge pressure for each stage.
b) Gas suction and discharge temperature for each stage
c) Compressor lube oil header pressure
d) Engine oil header pressure
e) Engine cooling water temperature
f) Compressor cooling water temperature

The analog gauge board shall be placed on the side of the control panel.

17.0 **TECHNICAL SPECIFICATIONS:**

Minimum technical specifications for selected items are listed below:

17.1 **Control Panel:**

The minimum specifications for control panel are as follows:

a) Type : Enclosed self-supporting, rigid assembly & lockable type
b) Material : Metal body
c) Panel shall be provided with lifting lugs for lifting of the panels

	d) Ambient Temperature : Maximum 50 deg C e) Cable connection : Double compression FLP Cable gland f) Cable entry : Bottom g) Terminal type : Spring loaded h) I/O Card mounting rack: As per manufacturer's standard i) Wired Spare Terminals : 10% of each type of I/O after complete wiring j) Audio-Visual Alarm: Audio alarm through a hooter on/near the panel and visual alarm on HMI/ Display facility and flasher. k) Ingress Protection: IP 65 l) Maximum dimension of the panel include floor support: Length=4 feet, Width= 1 feet 4 inches		
17.1.1	Control Panel Piping And Tubing: a. Any pneumatic supply should be from an air header. The instrument air header shall be suitably sized, with isolation valves and shall be complete with suitable filter-cum-air regulators. 10% spare tapping points shall be provided. Unused tapping points shall be plugged. b. All Instrumentation tube, tube fittings, valve, plugs etc. shall be of SS-316 (NPT), suitably protected against corrosion.		
18.0	Control Panel Wiring: a. Open terminals shall generally be avoided. b. Multi stranded PVC insulated copper conductor shall be used in general with printed ferruling (ferruling is to be done in cross way like DEST/SOURCE). c. Wire carrying measurement signals associated with pressure transmitters, thermocouple and other low voltage level signals shall be routed in separate wire channels and not along-with power cables. (color identification of signal cables may also be followed up as far as possible)		

18.1	**Microprocessor based Programmable/configurable electronic logic controller:** The specification given below is the minimum requirement and not restricted to the following: Model : Latest model of Programmable/configurable electronic logic controller. Bidder to specify		
18.1.1	Hardware & Software: a) Processor: Processor shall be capable of handling all the parameters and all control loops, indications, annunciations etc. It shall have sufficient memory capacity with minimum of 20% extra memory as spare. b) Rack: As per Manufacturer's standard. c) I/O Card : Shall support the following i. Analog Input ii. Analog Output iii. Digital Input iv. Digital Output v. Thermocouple input d) Software: Latest Windows based application software for developing logic etc. on Windows operating system based device. e) Communication Ports: As per manufacturer to meet the philosophy mentioned in this document.		
19.0	Other functional specification for Programmable/configurable electronic logic controller:		
	i) Controller Scan Time: The scan time of the PLC should be 250 msec or less. Scan time of Controller is defined as the cycle time taken by the system to read input, process input executing logic, and update control output for all the logics configured within the system. Other activities like diagnostic routines, output/dump of data to peripherals, or any other activity that consume processor time shall also be accounted while computing scan time.		

	ii) System Hardware Requirements**:** 1. Each I/O channel should be isolated from each other. 2. Each I/O shall be protected against the reversal of polarity of the power voltage to I/O. 3. All the inputs shall be double ended i.e. two wires per input and not with common return for all inputs.		
	iii) Processor System**:** 1. The size of the memory shall be sufficient for storage of the program instructions required by the logic schemes and other functional requirements 2. Memory shall be non-volatile. However, in case volatile memory is provided, battery back-up shall be provided with a minimum of 12 months lifetime to keep the program storage intact. A battery life indication should be provided. 3. The system shall indicate the first out alarm contact in case of any tripping.		
	iv) System/ Application Software Requirements**:** 1. The system software shall include all programs for the Controller and HMI/ Display facility which are required to perform all functions. 2. All operating and application software shall be the latest revision. 3. Software shall have the facility for generation of various displays of process alarms, system alarms, events etc. Two sets of backup copies of the software shall be provided in CD. 4. All details and description shall be provided for the software package 5. It shall be possible to download changes in software. 6. The central processing unit shall, under normal working conditions, be less than 70% loaded. This loading shall be demonstrated during FAT.		

19.1	**Human Machine Interface (HMI)/ Display facility:** The control panel will be equipped with a minimum 12-inch HMI/ Display facility with touch screen facility • for display of critical engine and compressor process data. • to facilitate trouble-shooting • to display SOE (Sequence of Events) • To display the alarm & trip status • To change the trip, alarm and timer set point, PID tuning parameters • To display historical trends The HMI/ Display facility shall be easily accessible and easily configurable.		
19.2	**Cable & JB specification:** All cables shall be provided with marking including manufacturer's name , insulation material, conductor size , no. of pairs , voltage rating , type of cable etc. , progressive sequential marking of the length at every one meter. All cables shall be PVC insulated. The insulation grade shall be 1100V as minimum. All cables shall be armoured. Cable Gland for armoured cable should be FLP Double Compression Gland of SS316. a) The cable shall be new and in good condition and shall be suitable for layering and bunching in ladders, trays and ducts. b) All power and control cables shall be flame retardant, low smoke type with sunlight and oil resistant outer sheath, suitable for installation on onshore oil and gas processing facilities. c) Cables shall be flexible; suitable for easy termination.		
	Minimum Requirements:		

19.2.1	Signal Cable Specification (for analog signals) a. Type of cable: PVC Insulated (Fire Retardant Low Smoke) copper cable, single triad, shielded copper cable b. Construction: Multi strand/ solid annealed electrolytic copper c. Conductor: 1 sq. mm d. Primary Insulation: Extruded PVC e. Voltage rating: 1100 volts f. Shield: Each triad shall be shielded with aluminum backed mylar g. Armour: Armour shall be of Galvanised steel wire h. Drain wire material : Annealed Tin Copper		
19.2.2	Control Cable Specification (for digital input and digital output) a. Type of cable: PVC Insulated (Fire Redundant Low Smoke) armoured copper cable, 3 core b. Construction: 1.5 sq. mm size, solid bright annealed electrolytic copper conductor, insulated and sheathed. c. Voltage Rating: Up to and including 1100 volts d. Primary Insulation: Extruded PVC e. Armour: Armour shall be of Galvanised steel wire		
19.2.3	Power Cable Specification a. Type of cable: PVC Insulated (Fire Redundant Low Smoke) armoured copper cable b. Construction: Size as per design requirement, copper conductor c. Voltage Rating: Up to and including 1100 volts d. Primary Insulation: Extruded PVC e. Armour: Armour shall be of Galvanised steel wire f. Core Identification: Red, Black and Green		

19.2.4	Thermocouple Cable Specification a. Type of cable: Thermocouple Extension Cable, K type (Chromel-Alumel) b. Quantity Tolerance: +/- 5 % c. Conductor Size: 16 AWG d. Armour: Armour shall be of Galvanised steel wire e. Voltage Grade(V): 600 f. No. of pairs: 2 g. No. of strands: 1 h. Primary Insulation: Extruded PVC i. Shield: Aluminium backed mylar tape j. Drain wire material : Annealed Tin Copper k. Overall Drain wire Size (sqmm): 0.5 approx.		
19.2.5	Junction Box Specifications a. Thread type: Suitable for NPT (M) cable gland. b. Electrical area classification: IEC Zone-2 Gr. IIA/IIB/IIC T3 c. Weatherproofing: Conforming to IP54 or better/ Equivalent NEMA rating d. Operating area classification & Temperature category to be embossed on the body of the junction box. e. Earthing Points: 1 No.inside, 2 Nos.outside f. Spare Entry points: There should be 2 numbers which shall be plugged with SS plugs. g. Size: Should be sufficiently designed such that there is minimum 4 inches clearance for cable termination h. Mounting inside JB: DIN rail type.		
19.3	**Pressure Transmitter:** a. Operating Voltage: 24Vdc b. Electrical area classification: IEC Zone-2 Gr. IIA/IIB/IIC T3 c. Output: 4-20ma		

	d. Type: Without display e. Material of Construction: Stainless-steel f. Accuracy: Shall not exceed +-0.25% of span g. Stability: Shall not exceed +-0.25% span over 1 year h. Ingress Protection: IP66		
19.4	**Pressure Gauge:** a. Type: Direct Reading, Glycerin Filled b. Mounting: Local c. Accuracy: +/- 1.0% of Span d. Dial size: minimum 100 mm e. Dial colour: White black lettering f. Case material: SS g. Enclosure: IP 66 h. Lens: Laminated safety glass lens i. Pressure element: Bourdon tube j. Element Material: SS k. Socket material: SS l. Connection: 1/4 inch NPT(M) m. Over range protection: 130 % of full scale Units: Kg/cm2		
19.5	**Temperature Gauge:** a. Type: Direct Reading, Glycerin Filled b. Mounting: Local c. Accuracy: +/- 2.0% of Span d. Dial size: minimum 100 mm e. Dial colour: White black lettering f. Case material: SS g. Enclosure: IP 65 Lens: Laminated safety glass lens		

	h. Capillary: SS with armour i. Units: Deg C		
19.6	**Pressure Switch:** a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 b. Supply Voltage: 24Vdc c. Ingress Protection: IP65. d. Enclosure Material-Metallic e. Element Type: Diaphragm or other suitable element f. Element Material-SS316 g. Process connection Size: 1/2" NPTF h. Electrical connection-1/2 inch NPTF i. Total nos. of cable entry required-single. j. Type-Snap Action Micro Switch k. Contact Arrangement-SPDT l. Repeatability: Less than +- 1% of span		
19.7	**Scrubber Level Switch:** a. Pressure rating: 120 bar minimum b. Supply voltage: 24Vdc c. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 d. Process Connection: 2” NPTM e. Float Material: SS or similar f. Body Material: Metallic g. Switch type: Snap Action Micro Switch h. Contact Arrangement: SPDT		

19.8	**UPS:** a. Type: Double conversion On-Line UPS System with IGBT/ DSP based technology b. UPS rated power: Bidder to indicate the load calculation and mention the required rating of UPS offered. c. Input Power: Voltage Range- 160-276VAC,1Phase; Input Power Factor-0.8; Input Frequency range-50±5Hz(45-55Hz) d. Output Power: Output Voltage-230±1%of rated output voltage, AC,1phase; Static Regulation- +/-3%of nominal regulation; Output Frequency-50Hz±1%; Output waveform- Sinusoidal with relative harmonic not exceeding 4%for linear and non - linear load; Output Power Factor- 0.8 or better. e. Load Crest Factor- 3:1 f. Efficiency: > 90%in high efficiency mode; >85%in normal mode. g. Battery: Sealed Maintenance Free (SMF) Lead Acid battery h. Backup time: The UPS should capable to provide 1 hour battery backup time at full load. i. Battery Rating &Configuration: Total number of batteries required for 1 hour min backup at full load, Voltage of each battery, Ampere-Hour rating of each battery should be clearly mention in the offer. j. Bypass Facility: Static &Manual Bypass k. Indication LCD Panel: The UPS should have a LCD panel with keypad and backlight. It should provide useful information about the UPS itself, operating status & diagnostic indication, load status, events. l. Measurements and settings. The Event Log and alarms should display on the LCD Panel. m. Operation mode: Cold Start Feature -Should allow UPS to start on Batteries without utility input; Auto Re-Start Feature-The UPS should automatically restart if utility returns after the output was shutoff due to exhausted batteries; Automatic Bypass- UPS should have automatic Transfer to Bypass When Overload condition occurs. n. Environment: Ambient Operating Temperature Upto 40degC; Relative Humidity-Should not exceed 95% non-condensing.		

19.9	**Electronic Hooter:** a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 b. Operating Voltage: 24Vdc c. Sound Output: Minimum 100 dB d. Ingress Protection: Minimum IP65		
19.10	**Electronic Flasher:** a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 b. Operating Voltage: 24Vdc c. Effective Intensity: Minimum 100 Cd d. Ingress Protection: Minimum IP65		
19.11	**Vibration Measurement:** a. Frequency Response: atleast 3 Hz to 1000 Hz b. Type: Piezo electric c. Full scale: atleast 0-50mm/s rms d. Supply Voltage: 24Vdc e. Output: 4-20ma f. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3		
19.12	**I/P Convertor** a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 b. Input signal: 4-20ma c. Output signal: 3-15psi d. Supply pressure: 20 psi e. Output air capacity: Minimum 6 Nm3/hr f. Accuracy: At least +- 0.5% of span g. Repeatability: At least +- 0.3% of span h. Body material: Metal		

	i. Adjustment: Zero and span adjustment shall be possible j. Process connections: ½" NPTF k. Electrical connections: 1/2" NPTF. l. Ingress Protection: atleast IP66		
19.13	**Solenoid Valve** a. Electrical Area Classification-IEC Zone-2 Gr. IIA/IIB/IIC T3 b. Type: Direct acting c. Body material: Metal d. Ingress Protection: atleast IP66 e. Operating Voltage: 24Vdc f. Electrical connection: ½" NPTF		
19.14	**Laptop** a. Processor: Intel Core i7 b. Operating System: Latest Microsoft Windows Professional c. Graphics: Intel HD graphics or better d. Display: Minimum 14" e. RAM: Minimum 16GB f. Storage: Minimum 512GB SSD g. Keyboard: Inbuilt h. Touchpad: Inbuilt i. Optical Drive: DVD read/write capable j. LAN Port(RJ45): Minimum 01 numbers. k. Serial Port (9 pin; D-Sub): Minimum 01 numbers l. USB port: Minimum 03 numbers m. Communications: 10/100/1000 base T- ethernet; Intel dual band wireless; Bluetooth		

	n. Pre-installed software: Lifetime Licensed versions of Microsoft Excel, Microsoft Word and lifetime licensed versions of any other software required for configuring the supplied controller, HMI and any other component of the supplied control system that requires configuration. o. Hazardous Area Certification: IEC Zone-2 Gr. IIA/IIB/IIC T3 or equivalent ANSI 12.12.01 compliant. p. Battery: Minimum 4 hours of backup q. Accessories: Carrying Case.		
20	**BILL OF MATERIALS** BILL OF MATERIALS (BOM): Tentative BOM based on the above specifications and scope of work should be submitted by the bidder along with their technical bid. However any additional requirement, if found necessary to make the system functional and fulfil its purpose, bidder needs to supply the same without any extra cost to OIL. Bill of materials for reference purpose has been attached as Annexure-3.		
21	**CHECKLISTS** Duly Filled Technical specification checksheet, BEC BRC checksheet and Bill Of Materials shall be supplied by the bidder.		
22.0 Installation and Commissioning			
22.1	Removal of the existing pneumatic control panel, pneumatic instruments and tubing.		
22.2	Grouting work: Grouting of the panel in place of existing pneumatic panel on the compressor package skid.		
22.3	Electrical work: a) Laying and termination of Power cables and commissioning of the UPS and Power up the control panel through the UPS. Also bidder shall lay the power cable from electrical feeder present in the installation to the UPS.		

	b) Construction of required earth pits and termination to earth pit at panel side shall be in bidder's scope. Bidder shall test the earth pit and demonstrate to the satisfaction of OIL that the resistance is under acceptable limits. Laying of earth strips will be in the bidder's scope.		
22.4	Instrumentation work: a) Installation & Commissioning of Control panel b) Installation of field devices c) Laying cable, Termination/hookup of Field devices d) Laying & termination of all types of control cables and signal cables and associated jobs required for commissioning of the panel e) Calibration & loop checking of field / Panel instruments. f) Checking/verifying of the control panel as per Control scheme through Programmable/configurable electronic logic controller g) Testing & acceptance for performance run at site for after complete configuration and hook up Performance runs of the entire control panel system including UPS system for 72 hours.		
22.5	The system to be under observation for minimum 72 hours for satisfactory commissioning performance.		
22.6	Installation and Commissioning charges must be quoted separately (should not be clubbed together with main equipment) on lump sum basis which shall be considered for evaluation of the offers.		
22.7	While quoting Installation/Commissioning charges above, bidder should take into account all charges including to and fro fares, boarding/lodging, local transport at Duliajan, Assam, and other expenses of supplier's personnel during their stay at Duliajan.		
22.8	Bidder shall ensure that installation and commissioning of the control panel is completed at the shortest time possible as un-availability of the compressor unit adversely affects production. Additionally the bidder shall prepare an installation and commissioning plan and get the same approved by OIL before the start of installation and commissioning.		
23. NOTES TO INSTALLATION AND COMMISSIONING AND SAFETY MEASURES			

23.1	Work will be done normally during day light hours & irrespective of holidays, Sundays etc. However, in case of emergency, work may have to be done beyond normal working hours with prior permission from Installation Managers/user department/CISF.		
23.2	The successful bidder must obtain "Entry Permit" from CISF Commandant/ Head-Security of OIL for all his workers to enable them to work inside the installations.		
23.3	NUISANCE: - The successful bidder or his representative shall not at any time cause any nuisance on the site or do anything which shall cause un-necessary disturbance in the installation. OIL reserves the right to reject any one or all the personnel deployed by the successful bidder on the basis of their performance, conduct and discipline. If any replacement is sought by Engineer-in-Charge, the same shall have to be arranged by the successful bidder within 24 Hours or as per instruction of Engineer-in-Charge. In case of any dispute the decision of Engineerin-Charge shall be final and binding		
23.4	CARE OF WORKS: - From the commencement to completion of work, the successful bidder shall take full responsibility for the care of all equipments and pipelines including all temporary works and in case any damage, loss or injury shall happen to the equipment/work/person or to a part thereof due to negligence of the successful bidder, the same shall be rectified/compensated by the successful bidder without any extra claim.		
23.5	The successful bidder shall abide by all safety and security rules and regulations existing in the OIL's Installations. The successful bidder shall observe the safety measures required to be undertaken for safety of persons, labour, public and properties at work site/ plant premises/ residential premises/ public places etc. The successful bidder shall be required to take work permit from respective shift in charges for each day and each shift for all kind of jobs. There can be instances of not getting permits, withdrawing of permits already issued at any stage of work due some operational safety and security reasons. For any stoppage of work for such reasons no claim whatsoever will not be considered		
23.6	Any compensation arising out of the job carried out by the successful bidder whether related to pollution, Safety or Health will be paid by the successful bidder only.		
23.7	Any compensation arising due to accident of the successful bidder's personnel while carrying out the job, will be payable by the successful bidder.		

23.8	The successful bidder shall have to report all incidents including near miss to Installation Manager/ departmental representative of the concerned department of OIL		
23.9	In case the successful bidder is found non-compliant of HSE laws as required, the company will have the right for directing the successful bidder to take action to comply with the requirements, and for further non-compliance, the successful bidder will be penalized as per prevailing relevant Acts/ Rules/ Regulations		
23.10	When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE measures, Company will have the right to direct the successful bidder to cease work until the non-compliance is corrected.		
23.11	All safety gears like safety boots, helmets, safety belts, hand gloves, safety goggles, gas masks etc. required for carrying the job in a safe manner shall be arranged by the successful bidder		
23.12	CLEARANCE OF SITE: - As a part of the job, the successful bidder shall completely remove all the temporary/ disposable materials if needed while execution of work or after completion of work at his own cost and dispose off the same as directed by Engineer-in-Charge.		
23.13	The successful bidder shall maintain first aid facilities for its employees. All critical industrial injuries shall be reported promptly to Oil India Limited, and a copy of the successful bidder's report covering each personal injury requiring the attention of a physician shall be furnished to the Oil India Limited		
23.14	If the company arranges any safety class / training for the working personnel at site (company employee, contractor worker, etc.) the contractor will not have any objection to any such training		
23.15	The contractor/supervisor shall arrange daily tool box meetings and maintain records accordingly		
	The Contractor shall prepare written Safe Operating Procedures (SOP) for the works to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them. The SOPs should clearly state the risk arising to men, machineries & material from the mining operation / operations to be done by the contractor and how it is to be managed. Before adoption, same to be approved by OIL		
23.16	The contractor shall keep the SOP up to date and shall provide a copy of the set of SOP to OIL for record		

24.0 Inspection and Commissioning			
24.1 Factory Acceptance Test (FAT):			
24.1.1	OIL reserves the right to involve and satisfy itself at each and every stage of testing.		
24.1.2	Comprehensive hardware tests shall be carried out as part of bidder's QA/QC procedure. The test reports shall be forwarded to OIL.		
24.1.3	Before the system is delivered to the site, satisfactory performance of the entire system shall be demonstrated. OIL shall depute minimum two persons for witnessing the FAT. The system shall simulate the final onsite configuration as closely as possible		
24.1.4	The successful bidder shall intimate OIL atleast 60 days prior to FAT for deputing OIL's personnel, cost of travel, accommodation and other expenses of OIL's inspection team will be borne by OIL.		
24.1.5	The tests undertaken shall demonstrate that each of the following requirement has been fulfilled: • The system is tested as an integrated system as far as possible. • The hardware and software requirements are fulfilled • All tests are documented in a checklist fashion The system is fully proven and ready for service.		
25.0	Detailed test schedules, including at least the tests listed below, shall be submitted for the Company's approval one month before the testing. The Bidder shall have a technician and test equipment available full time during testing.		
26.0	The following minimum activities shall be part of the Factory Acceptance Test in addition to any tests recommended by the bidder:		

	• Inspection of equipment and BOM verification • Checking the equipment against GA drawing. • Checking of panel wiring including ferrules. • Functional tests, including but not limited to: 1) Control panel functions 2) Loop test 3) Operation of power supplies 4) Diagnostic test, including self-test facilities 5) System and process alarms • Application logic test along with HMI/Display facility functionality test • System responsiveness (e.g.: scan time, alarm discrimination, logging and screen updates) • Spare capacity verification Communication check of the supplied controller through LAN and cellular network. Additionally Modbus communication shall be demonstrated using mod scan.		
27.0 Site Acceptance Test (SAT):			
27.1	SAT shall be started only after satisfactory performance of loop checking and verification of records and closing of FAT punch-points.		
27.2	Site acceptance tests shall be carried out in presence of OIL's representative		
27.3	Bidder shall carry out following tests as minimum as part of SAT: • Hardware verification as per final Bill of material. • Visual & Mechanical inspection for proper workmanship, identification, ferruling, name plates etc. • System configuration as per approved configuration diagram / scheme. • Demonstration of all system diagnostics. • Testing of all operational functionalities including alarm and trip logic function. • System performance test.		

	Communications check of the all the supplied items including controllers and remote access facility.		
28.0	OIL will finally witness successful uninterrupted operation of the integrated system for the duration of minimum 72 hours for each panel for the operation of respective gas compressor units. Bidder's personnel shall be present during the test. Any malfunctioning of the system components (supplied under this contract) shall be rectified free of cost .Once the failure in the control panel is detected, the test shall start all over again from the beginning. OIL shall take over the system for regular operation once the Site Acceptance Test is completed successfully.		
29.0 Training			
29.1	Following free of cost training program shall be organized by Bidder at OEM location. If the location for FAT and training is the same then the FAT and training shall be combined for OIL Instrumentation Engineers on maintenance of the control system: • Training shall be imparted for minimum 04 Engineers. • Training duration shall be of minimum 10 days. • Hands on training on simulator systems to maintenance engineer to enable them to operate the units in safe and efficient manner. • Hands on training on the software features of the Programmable/configurable electronic logic controller for ease of maintenance troubleshooting and seamless operation. • Hands on training on programming/configuration of Programmable/configurable electronic logic controller for the ease of maintenance. • Training on the hardware features of the supplied control system. • The successful bidder shall intimate OIL atleast 60 days prior to start of training for deputing OIL's personnel, cost of travel, accommodation and other expenses of OIL's team will be borne by OIL. Training manuals shall be provided to each participant in hard copy and soft copy.		
29.2	The successful bidder shall provide on-site free of cost training of 2 days on the operation of the units to operation and maintenance engineers after successful commissioning of the units.		

30.0 Documents to be submitted by bidder for Review/ approval /information to OIL:			
30.1	The review/approval by OIL does not signify compliance with the purchase order. Review/approval by OIL is for quality assurance purpose only.		
30.2	It is bidder's sole responsibility to comply with the requirement of this tender and applicable codes etc.		
30.3	Documents to be submitted during detailed Engineering for OIL approval: a) General arrangement drawing of the panel. b) Interface drawing for third party connections. c) Cable schedule. d) Instrument hookup drawing. e) Instrument data-sheet. f) Electrical wiring drawing. g) Load calculation for the complete system. h) Instrumentation Loop diagram. i) Operation & Control philosophy and Logic details of start-up, sequence, interlock, safety shutdown, alarm, control & monitoring. j) Cause and effect matrix. k) Instrument index. l) Earth pit drawing m) I/O configuration details n) FAT & SAT procedure o) Alarm and trip schedules.		
30.4	The following documents shall be submitted after successful commissioning as as-built documents. These documents shall incorporate all the changes made during commissioning. 01 (one) set of hard copy and 01(one) set of softcopy shall be provided for each control panel. a) General arrangement drawing. b) Interface drawing for third party connections. c) Cable schedule. d) Instrument hookup drawing.		

	e) Instrument data-sheet. f) Electrical wiring drawing. g) Instrumentation Loop diagram. h) Operation & Control philosophy and Logic details of start-up, sequence, interlock, safety shutdown, alarm, control & monitoring. i) Cause and effect matrix. j) Instrument index. k) Earth pit drawing l) Certification for hazardous area usage compliance as per section 19. m) Data sheets for all instruments. n) Operation and Maintenance Manual. Alarms and trip schedules.		

Annexure-3 BILL OF MATERIALS (BOM) for each package:

Tentative BOM based on the specifications and scope of work has been attached herewith for reference. However, its in bidders scope to include any additional requirement, if found necessary to make the system functional and fulfil the technical specifications of the tender document. Bidder needs to supply same without any extra cost to OIL.

Sl. No.	Item Description	Quantity	Unit	Bidders Acceptance
1	Control Panel	01	No.	
2	Tubes and Fittings	01	Lot	
3	UPS	01	No.	
4	Cables	01	Lot	
5	Pressure Transmitter Blind Type	11	Nos.	
6	Vibration Transmitters	07	Nos.	
7	Thermocouple	11	Nos.	
8	Scrubber Level Switch	02	Nos.	
9	Engine Oil level Switch	01	No.	
10	Compressor Oil Level Switch	01	No.	
11	Compressor Oil No flow switch	01	No.	
12	Engine Jacket water no flow DP switch	01	No.	
13	Compressor Jacket water no flow DP switch	01	No.	
14	Pressure switch	08	Nos.	
15	Solenoid Operated Valves	08	Nos.	
16	RPM sensor	01	Nos.	
17	I/P Convertor	02	Nos.	
18	Pressure Gauge	06	Nos.	
19	Temperature Gauge	06	Nos.	
20	Electronic Controller	01	No.	
21	12” HMI	01	No.	
22	I/O cards	As per requirement		
23	Relays	As per requirement		
24	Isolators	As per requirement		

Annexure-A

TECHNICAL EVALUATION MATRIX FOR BRC (TECHNICAL) (TO BE DULY FILLED IN BY BIDDER AND SIGNED)			
BID EVALUATION CRITERIA			
Clause Number	**DESCRIPTION**	**BIDDER'S RESPONSE (TO BE FILLED BY THE BIDDER)**	
		(Complied / Not Complied / Deviation / Not Applicable)	**Relevant Location of their Bid to support the remarks / compliance** (Reference of Document name / Serial number / Page number of bid for documentary evidence)
A1	**TECHNICAL CRITERIA:**		
1.0	**BIDDERS' QUALIFYING CRITERIA:** 1.1 The bidder shall be an Original Equipment Manufacturer (OEM) of the tendered item(s) OR The bidder shall be authorized agent / dealer / distributor / supply house of an OEM of the tendered item(s). Note: a) Bidder(s) other than OEM must submit a valid Authorization letter and back-up warranty from the manufacturer. The Authorization and back-up warranty letter duly sealed & signed by the Manufacturer on their official letterhead must be submitted along with the technical bid. b) The Sole Selling Agent/Dealer/Distributor/Supply House shall categorically confirm in their technical bid that there will be no change of the proposed OEM after submission of the bid.		
2.0	**BIDDERS' EXPERIENCE:**		
2.1	**2.1 IN CASE THE BIDDER IS A MANUFACTURER (OEM):**		

	2.1.1 <u>OEM proposing for supply and services by themselves:</u> The OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for Supply and Installation & Commissioning of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per Para 2.3 2.1.2 <u>OEM proposing for supply by themselves and services by their authorized service provider/ distributor/ sole selling agent/ supply house:</u> A) The OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for "Supply" or "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3.1(a) for "Supply" or 2.3.1 (a) & (b) for " Supply and Installation & Commissioning); whichever is applicable. B) The OEM authorized service provider/ distributor / sole selling agent/ supply house must have experience of successfully executing one (1) order/contract for Installation & Commissioning of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3.1 (b) alongwith relevant PO copy.		
2.2	2.2 **IN CASE THE BIDDER is a Sole Selling Agent/Dealer/Distributor/Supply House of the Original Equipment Manufacturer (OEM)**: The following criteria shall be met by the Bidder and the OEM: i) Their proposed OEM must have experience of successfully executing (either by themselves or through any sole selling agent/ dealer/ distributor/ supply house) one (1) order for "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor		

	Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3. ii) Additionally, the bidder as a sole selling agent/ dealer/ distributor/ supply house must have experience of successfully executing one (1) order for "Supply and Installation & Commissioning" of minimum two (02) nos. of Control Panels for Natural Gas Compressor Package during last ten (10) years preceding to the original bid closing date of the tender. Documentary evidences in this regard must be submitted along with the technical bid as per para 2.3		
2.3	**2.3 NOTES TO BIDDER REGARDING EXPERIENCE CRITERIA:** 2.3.1 The following documentary evidences to substantiate above experience records (2.1 and 2.2, as applicable) of the Bidder must be submitted along with the technical bid, failing which the Bid shall be treated as incomplete and rejected: (a) Copy of Purchase order/contract awarded by Client (b) Any one or combination of the following documents that confirms the successful execution of the purchase order / contract- True copies of Original Signed and sealed Completion report/performance certificate from the clients (on Client's/User's official letter head with signature & stamp). OR Any one or combination of the following documents that confirms the successful execution of the purchase order / contract – - Completion report / performance certificate from the clients, - Any other documentary evidence that can substantiate the successful execution of the Purchase Order / contract cited above. 2.3.2 The date of purchase order/contract need not be within ten (10) years preceding the original bid closing date of the Tender, but execution/ supply of required quantity must be within ten (10) years preceding the original bid closing date of this tender.		

	2.3.3 In case of extension to the scheduled Bid Closing date of this tender, if any, the Original scheduled Bid closing Date shall be considered for evaluation of Bids. 2.3.5 The purchase order/ contract must bear the purchase order number/ contract number which clearly indicate the scope of work and technical specifications of the item. 2.3.6 The experience of the bidder's sister concern/ subsidiary shall not be considered for evaluation.		
A.2	**FINANCIAL CRITERIA:**		
	6.0 **Annual Turnover:** The bidder shall have an annual financial turnover of minimum **INR 2,27,41,747.50** during any of the preceding 03 (three) financial years reckoned from the original bid closing date, irrespective of whether their bid is for all the tendered items or not. 7.0 "**Net Worth**" of the bidder must be positive for the financial/accounting year just proceeding to the original Bid Closing Date of the Tender **(i.e., Year 2020-21).** 8.0 Considering the time required for preparation of Financial Statements, if the last date of preceding financial/accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial/accounting year are not available with the bidder, then the financial turnover of the previous three financial/accounting years excluding the preceding financial/ accounting year will be considered. In such cases, the Net worth of the previous financial/accounting year excluding the preceding financial/ accounting year will be considered. However, the bidder has to submit an affidavit/ undertaking **(ref. Proforma-6)** certifying that		

	'the balance sheet/Financial Statements for the financial year **2020-21** has actually not been audited so far'. **Note:** b) For proof of Net worth any one of the following document must be submitted along with the technical bid:- i) A certificate issued by a practicing Chartered / Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual Turnover & Net worth as per format prescribed in **Proforma-7**. OR ii) Audited Balance Sheet along with Profit & Loss account. b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/ State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same. 9.0 In case the Audited Balance Sheet and Profit & Loss Account submitted along with the bid are in currencies other than INR or US$, then the bidder shall have to convert the figures in equivalent INR or US$ considering the prevailing conversion rate on the date of Balance Sheet and Profit & Loss Account. A CA certificate is to be submitted by the bidder regarding converted figures in equivalent INR or US$. 10.0 In case the Bidder is subsidiary company (should be 100% owned subsidiary of the parent/ultimate parent/holding company) who does not meet financial criteria by itself and submit its bid based on the		

	strength of parent/ ultimate parent/ holding company, then following documents need to be submitted: i) Turnover of the parent/ ultimate parent/ holding company should be in line with Para 1.0 above. ii) Net Worth of the parent/ultimate parent/ holding company should be positive in line with Para 2.0 above. iii) Corporate Guarantee (as per Proforma-8) on parent / ultimate parent/ holding company's company letter head signed by an authorized official undertaking that they would financially support their wholly owned subsidiary company for executing the project/ job in case the same is awarded to them. iv) Document of subsidiary company being 100% owned subsidiary of the parent/ ultimate parent/ holding company.		

ANNEXURE-B

COMMERCIAL CHECKLIST:

Sl.	REQUIREMENT	COMPLIANCE
1.0	Whether quoted as manufacturer?	Yes / No
2.0	Whether quoted as OEM Dealer / Supply House etc. To Specify-	Yes / No
2.1	If quoted as OEM Dealer / Supply House. (a) Whether submitted valid and proper authorization letter from manufacturer confirming that bidder is their authorized Dealer / supply House for the product offered?	Yes / No
2.2	(b) Whether manufacturer's back-up Warranty/Guarantee certificate submitted?	Yes / No
2.3	Whether all documents have been submitted as required for fulfilling Experience criteria clause of BRC-Technical.	Yes / No
3	Name of Manufacturer.	
4	Local content amount and percentage. Details of locations at which the local value addition is made.	
5	Name, Address, Phone No & E-mail id of Bidder.	

PROFORMA – 4

INTEGRITY PACT

Between

Oil India Limited (OIL) hereinafter referred to as "The Principal"

And

(Name of the bidder).....hereinafter referred to as "The Bidder/Contractor"

Preamble:

The Principal intends to award, under laid down organizational procedures, contract/s for **Tender No. ……**The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organization "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an external independent Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section: 1 -Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

1. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

2. The Principal will, during the tender process treat all Bidders with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential/additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

3. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a Page 2 of 6 substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section: 2 -Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

1. The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which h e/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2. The Bidder/Contractor will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, Subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

3. The Bidder/Contractor will not commit any offence under the relevant Anticorruption Laws of India; further the Bidder/Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

4. The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(3) The Bidder/Contractor signing Integrity Pact shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.

Section 3 -Disqualification from tender process and exclusion from future Contracts

If the Bidder, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or risibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1. If the Bidder/Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressions within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

2. The Bidder accepts and undertakes to respect and uphold the Principal's Absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

3. If the Bidder/Contractor can prove that he has restored/recouped the Damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

4. A transgression is considered to have occurred if in light of available evidence no reasonable doubt is possible.

5. Integrity Pact, in respect of a particular contract, shall be operative from the date Integrity Pact is signed by both the parties till the final completion of the contract or as mentioned in Section 9- Pact Duration whichever is later. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings

Section 4 -Compensation for Damages

1. If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit / Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

3. The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount or the liquidated damages, the Bidder/Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 -Previous transgression

1. The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

2. If the Bidder makes incorrect statement on this subject, he can be
disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section: 6 -Equal treatment of all Bidders/Contractor/Subcontractors

1. The Principal will enter into Pacts on identical terms with all bidders and contractors.

2. The Bidder / Contractor undertake(s) to procure from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the provisions laid down in this agreement/Pact by any of its sub-contractors/sub-vendors.

3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section: 7 -Criminal charges against violating Bidders/Contractors/ Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section: 8 -External Independent Monitor/Monitors

1. The Principal appoints competent and credible external independent Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

3. The Contractor accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor with confidentiality.

4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the bidder / contractor to present its case before making its recommendations to the Principal.

6. The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.

7. If the Monitor has reported to the Chairperson of the Board a Substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8. The word 'Monitor' would include both singular and plural.

Section:9 -Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by Chairperson of the Principal.

Section:10 -Other provisions

1. This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

2. Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

3. If the Contractor is a partnership or a consortium, this agreement must be, signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

T. R. DUTTA

…….. **……..**

For the Principal **For the Bidder/Contractor**

Witness 1: .....

Witness 2: .....

Place: Duliajan

Date:

PROFORMA – 6

FORMAT FOR CERTIFICATE OF COMPLIANCE OF FINANCIAL CRITERIA

Ref: Clause No. B - Financial Criteria of the BEC

Tender No.: _____

I ……..……. the authorized signatory(s) of …… (Company or firm name with address) do hereby solemnly affirm and declare as under:-

The balance sheet/Financial Statements for the financial year _____ (as the case may be) has actually not been audited as on the Original Bid closing Date.

Place :…….

Date :……. Signature of the authorized signatory

Note: This certificate are to be issued only considering the time required for preparation of Financial Statements i.e. if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date.

PROFORMA - 7

CERTIFICATE OF ANNUAL TURNOVER & NET WORTH

TO BE ISSUED BY PRACTISING **CHARTARD ACCOUNTANTS' FIRM** ON THEIR LETTER HEAD

TO WHOM IT MAY CONCERN

This is to certify that the following financial positions extracted from the audited financial statements of M/s…….(Name of the bidder) for the last three (3) completed accounting years upto…… **(as the case may be)** are correct

YEAR	TURN OVER In INR (Rs.) Crores/ US $ Million) *	NET WORTH In INR (Rs.) Crores / US $ Million) *

*****Rate of conversion (if used any): USD 1.00 = INR …….

Place:
Date:

Seal

Membership No:
Registration Code:

Signature

NOTE: As per the guidelines of ICAI, every practicing CA is required to mention Unique Document Identification Number (UDIN) against each certification work done by them. Documents certified by CA without UDIN shall not be acceptable.

PROFORMA – 8

PARENT/ ULTIM ATE PARENT/ HOLDING COMPANY'S CORPORATE GUARANTEE TOWARDS FINANCIAL STANDING (Delete whichever not applicable)

(TO BE EXECUTED ON COMPANY'S LETTER HEAD)

DEED OF GUARANTEE

THIS DEED OF GUARANTEE executed at ..... this ..... day of ..... by M/s .....(mention complete name) a company duly organized and existing under the laws of ..... (insert jurisdiction/country), having its Registered Office at .....herein after called "the Guarantor" which expression shall, unless excluded by or repugnant to the subject or context thereof, be deemed to include its successors and permitted assigns.

WHEREAS M/s. Oil India Limited (hereinafter referred to as OIL) has invited offers vide their Tender No…… for……and M/s……..(Bidder) intends to bid against the said tender and desires to have Financial support of M/s…… [Parent / Ultimate Parent/Holding Company(Delete whichever not applicable)] and whereas Parent/Ultimate Parent/Holding Company(Delete whichever not applicable) represents that they have gone through and understood the requirements of subject tender and are capable and committed to provide the Financial support as required by the bidder for qualifying and successful execution of the contract, if awarded to the bidder.

Now, it is hereby agreed by the Guarantor to give this Guarantee and undertakes as follows:

1. The Guarantor confirms that the Bidder is a 100% subsidiary of the Guarantor.
2. The Guarantor agrees and confirms to provide the Audited Annual Reports of any of the preceding 03(three) financial/accounting years reckoned from the original bid closing date.
3. The Guarantor have an annual financial turnover of minimum INR……. Cr or USD …… during any of the preceding 03(three) financial/ accounting years reckoned from the original bid closing date.
4. Net worth of the Guarantor is positive for preceding financial/ accounting year.
5. The Guarantor undertakes to provide financial support to the Bidder for executing the project/job, in case the same is awarded to the Bidder.
6. The Guarantor represents that:

(a) this Guarantee herein contained shall remain valid and enforceable till the satisfactory execution and completion of the work (including discharge of the warranty obligations) awarded to the Bidder.
(b) the liability of the Guarantor, under the Guarantee, is limited to the 100% of the order value between the Bidder and OIL. This will, however, be in addition to the forfeiture of the Performance Guarantee furnished by the Bidder.
(c) this Guarantee has been issued after due observance of the appropriate laws in force in India.
(d) this Guarantee shall be governed and construed in accordance with the laws in force in India and subject to the exclusive jurisdiction of the courts of New Delhi, India.
(e) this Guarantee has been given without any undue influence or coercion, and that the Guarantor has fully understood the implications of the same.
(f) the Guarantor has the legal capacity, power and authority to issue this Guarantee and that giving of

this Guarantee and the performance and observations of the obligations hereunder do not contravene any existing laws.

for and on behalf of (Parent/Ultimate Parent/ Holding Company) (Delete whichever not applicable) Witness: 1. 2.	for and on behalf of (Bidder) Witness: 1. 2.