



INDRADHANUSH GAS GRID LIMITED
TECHNICAL SPECIFICATION FOR NATURAL GAS
COMPRESSOR STATION FOR
NORTH EAST GAS GRID PIPELINE PROJECT



Sl.No.	ITEM DESCRIPTION	PREFERRED MAKES
18	LOUD SPEAKER TALK BACK(LSTB) / LOUD SPEAKER INTERCOMMUNICATION(LSIS)	BOSCH / PHI-AUDIOCOM / MEGA.
19	LOUD SPEAKER TALK BACK(LSTB) / LOUD SPEAKER INTERCOMMUNICATION(LSIS) SYSTEMS SUPPLIERS	PHI-AUDIOCOM / POWER SYSTEMS, KOLKATA / MEGA
20	TELEPHONE CABLE SUPPLIERS	DELTON CABLES / TELE-LINK NICCO /
21	VHF SYSTEM	MOTOROLA / YAESU / VERTEX –STANDARD
22	CCTV CABLES	POLYCAB/FINOLEX/THERMOCABLE/SUYUG

H. HT, LT POWER & CONTROL CABLES

1	LT POWER CABLES (PVC / XLPE)	UNIVERSAL/ RPG CABLES (ASIAN)/ POLYCAB/ FINOLEX/ TORRENT/ HAVELLS/ KEI/ SPECIAL CABLES/ TCL / SPECIAL CABLES/ RALLISON/ PARAMOUNT/ CORDS/ LAPP/ CHANDRESH / RAVIN
2	PVC CONTROL CABLES	LAPP/ UNIVERSAL/ RPG CABLES (ASIAN)/ POLYCAB/ FINOLEX/ TOSHNIWAL/ DELTON/ KEI/ SPECIAL CABLES/ TCL SPECIAL CABLES/ RALLISON/ PARAMOUNT/ CORDS/ HAVELLS/ RAVIN
3	HEAT RESISTANT CABLES (EPR / CSP & SR)	LAPP/ UNIVERSAL/ RPG CABLES (ASIAN)/ FINOLEX/ TOSHNIWAL/ DELTON/ TORRENT/ SPECIAL CABLES
4	HT XLPE CABLES	UNIVERSAL/RPG CABLES (ASIAN)/TORRENT/ POLYCAB/ PARAMOUNT (UPTO 33 Kv)/ KEI
5	SCREENED CONTROL CABLES	REFER INSTRUMENT LIST
6	TRAILING CABLES	LAPP/ UNIVERSAL/ ASIAN



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Sl.No.	ITEM DESCRIPTION	PREFERRED MAKES
7	LIGHTING WIRE (PVC) FRLS	DELTON/ FINOLEX/ UNIVERSAL/ HAVELLS/ INCAB/ KEI/ GEMSCAB/ PARAMOUNT/ POLYCAB
9	OPTICAL FIBRE CABLE	MOLEX / LUCENT / FINOLEX / ERICSON / STERLITE
10	CABLE GLANDS	LAPP/ HANSEL/ PHOENIX/ COMET/ PRECISSION- QUALITY/ SUNIL & CO./

I. ILLUMINATION & MISCELLANEOUS ITEMS

1	TEMP. SCANNER	ADVANI OERLIKON/ ECI/ INSTRUMENTATION LTD./ MASIBUS/ PYROTECH/ SIEMENS
2	LAMPS	BAJAJ/ CROMPTON/ GE LIGHTING/ PHILIPS/ OSRAM/ SIGMA
3	LIGHT FITTING (FIXTURES) COMPLETE WITH ALL ACCESSORIES EXCEPT LAMP	BAJAJ/ CROMPTON/ GE LIGHTING/ PHILIPS/ SIGMA/ HAVELLS
4	FLAME PROOF LIGHT FITTING	GOVAN/ BALIGA/ FLEXPRO/ SUDHIR/ CEAG/ FGG/ SIGMA/ EX-PROTECTA VITHAL UDHYOG
5	LIFTING MAGNETS	OHIO/ WALKER/ EPMS
6	LIGHTING TRANSFORMER	BHEL/ BHARAT BIJLEE/ AREVA/ CGL/ EMCO/ VOLTAMP/ KIRLOSKAR ELECTRIC COMPANY/SAI ELECT/UNIVERSAL
7	LIGHTING MAST	PHILIPS / BAJAJ / CGL/CROMPTON/GE
8	WELDING SOCKETS	BCH/ SCHNEIDER/ BEST & CROMPTON/ GEPOWER/ HAVELL/ JAIBALAJI/ HENSEL/ MDSLEGRAND
9	LAPTOP/NOTE-BOOK/ PC	HP/LENOVO/COMPAC/ DELL WIPRO/ IBM





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Sl.No.	ITEM DESCRIPTION	PREFERRED MAKES
10	CONTROL TRANSFORMERS	AEI/ AEP/ VOLTAMP/INTRAVIDYUT/INDCOIL/ KAPPA/
11	5/15A PIANO SWITCH	ANCHOR/ ELLORA/ MDS LEGRAND/ CONA/ PRECISION/ CRAB TREE
12	SWITCH SOCKET OUTLET	ALSTOM/ ANCHOR/ BCH/ CGL/ ESSEN/ BEST & CROMPTON/ AREVA
13	EXHAUST FANS/CEILING FANS	CGL/ CINNI/ KHAITAN/ POWERVENT/ VENTWELL/ BAJAJ/ USHA/ ORIENT/ HAVELLS
14	HOOTER/BUZZER/BELL	KHERAJ / EPCC(KAKKU)
15	POWER PACK FOR MAGNETS	ELECTROMAG/BCH/EPCC(KAKKU)
16	RESISTORS (CRANES)	BCH/ ELECTROMAG/ AMP CONTROL/ EPCC/ SIEMENS/ RESITECH
17	LT CAPACITORS	GE POWER/ ABB/ CGL/ MEHER CAPACITORS/ UNI STAR
18	FLAME PROOF LDB/FEEDER PILLAR	FCG/ Sudhir/ Prompt Engineering Works/Flame Proof equipments pvt. Ltd/ Baliga Lighting Equipments Pvt. Ltd. Flexpro Electricals Pvt. Ltd.

NOTE: The switch board manufacturer and other manufacturer shall follow the relevant IEC/IS & other standards.

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14.07 INSTRUMENTATION

Sl. No	ITEM DESCRIPTION	LIST OF MAKES
A.	<u>Field Instruments:</u>	
1.	Pressure Gauge, Differential Pressure gauge & its accessories	: WIKA, Forbes Marshall, Gauges Bourdon, Thermal Instruments, Baumer, Walchandnagar (Tiwac Div.), Goa Thermostatic, Radix, Standard Instruments
2.	Pressure / Differential Pressure switch (Mech. Type).	: WIKA, Switzer, Indfoss, Gauges Bourdon, Baumer
3.	Pressure / Differential Pressure switch (Electronic Type).	: Ifm, WIKA, Turck, Kaustubha Udyog
4.	Pressure / Differential Pressure/ Flow (DP type)/ Level (DP type)/ Temperature Transmitter	: Emerson, Fuji (except TT), Honeywell, Yokogawa, Siemens, Nivo Controls (except TT)
5.	Temperature gauge & thermowell	: WIKA, Gauges Bourdon, Thermal Instruments, Baumer, Walchandnagar (Tiwac div.), Forbes Marshall, Goa Instruments, Goa Thermostatic, Radix, Standard Instruments
6.	Thermocouple, RTD & thermowell	: Gauges Bourdon, Thermal Instruments, Toshniwal Industries, Tempsens, Pyro-electric Instruments, Baumer, Temcon, Goa Instruments, Standard Instruments, Radix, Altop
7.	Temperature Switch	: Ifm, WIKA, Switzer, Goa Instruments
8.	Rotameter	: Forbes-Marshall, Instrumentation Engineers, Eureka instruments, Scientific Devices.



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Sl. No	ITEM DESCRIPTION	LIST OF MAKES
9.	Orifice Plate & flanges Assembly, Venturi, Flow nozzle, Wedge flow element	: Engineering Specialities, Hydro-pneumatics, Micro-precision, Chemtrols-Samil, Minco Flow Element, Minco India, Unicontrols, ABB (Wedge flow only), DynaFluid, Eureka Industrial (Orifice assembly only)
10.	Averaging Pitot Tube, Annubar	: Emerson, Engineering Specialities, Hydro-pneumatics, Minco India, Unicontrols, DynaFluid
11.	Flow Switch (Mech. Type).	: Forbes-Marshall, Magnetrol, D.K. Instruments, Switzer, Levcon
12.	Flow switch (Electronic Type).	: Ifm, Magnetrol, D.K. Instruments, Nivo Controls, Turck India, E&H
13.	Electromagnetic flow meter	: Yokogawa, Emerson, Siemens, Endress & Hauser, Forbes-Marshall, Nivo Controls
14.	Vortex Flow meter	: Yokogawa, Forbes–Marshall, Endress & Hauser, Siemens, ABB
15.	Mass (coriolis) flow meter	: Emerson, Yokogawa, Forbes–Marshall, Endress & Hauser, Rockwin
16.	Ultrasonic Flow meter	: Yokogawa, Forbes–Marshall, Endress & Hauser, Siemens, Eureka Industrial
17.	PD/Turbine Flow meters	: Daniel (Emerson), Bopp & Reuther (Toshniwal), Liquid Controls, Rockwin
18.	Level gauge (tubular, magnetic, reflex type)	: Gauges Bourdon, Chemtrol, Magnetrol, Baumer, Techtrol, Sigma Instruments, V Automat, DK Instrument, Nivo Controls
19.	Level Switch (Conductivity type)	: SB Electro-mechanical, Techtrol, Nivo Controls, EIP, Sapcon, V AUTOMAT



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Sl. No	ITEM DESCRIPTION	LIST OF MAKES
20.	Level Switch (Capacitance/RF type)	: Endress & Hauser, SB Electro-mechanical, Techtrol, Nivo Controls, Sapcon, V AUTOMAT, EIP Enviro, Protocontrol
21.	Level Switch (Tuning fork/ Rod type)	: Vega, Endress & Hauser, Nivo Controls, S.B. Electro-mechanical, Sapcon
22.	Level Switch (Float type)	: D K Instruments, Chemtrols, V AUTOMAT, Gauges Bourdon, Sigma Instruments, Baumer, Scientific Devices, SB Electromechanical
23.	Level Switch/ Transmitter (Displacer type)	: Emerson, D K Instruments, Levcon Instruments, Trac
24.	Level Switch/ Transmitter (Ultrasonic type)	: Vega, Endress & Hauser, Siemens, Forbes- Marshall, Magnetrol, SB Electromechanical
25.	Level Switch/ Transmitter (Radar type)	: Vega, Endress & Hauser, Emerson (Rosemount), Siemens, Forbes- Marshall
26.	Level Switch/ Transmitter (Nucleonic type)	: Dr. Berthold, VEGA, E+H
27.	Level switch (Electro-mech type)	: D.K.Instruments, TRAC, LEVCON, VAUTOMAT, Forbes Marshall
28.	Control valve (Globe/Ball/V-Notch/Angle) along with Pneumatic Actuator & Pneumatic Positioner (non-smart)	: Fisher, Instrumentation Ltd, Masoneilan (Dresser Industries), Flowserve (Valtek), Samson Controls, Arca (Forbes Marshall), MIL Controls, Introl (RK Controls), Metso, Virgo (only ball type), Elomatic, Uniflow Control Instruments Pvt. Ltd., Dembla, Severn Glucon
29.	Control valve (Butterfly) along with Pneumatic Actuator & Pneumatic Positioner (non-smart)	: Fisher (Emerson), Instrumentation Ltd, Dembla (Except for power cylinder actuators), Fouress, Metso, Severn Glucon (India), Elomatic, Uniflow Control Instruments Pvt. Ltd. (wafer type only & upto 900mm size)



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Sl. No	ITEM DESCRIPTION	LIST OF MAKES
30.	Electrical Actuator	: Limitorque, Rotork, Bernard (Instrumentation Ltd), Marsh, Auma, Metso
31.	Electro-hydraulic actuator	: Reineke, Rexa
32.	I/P converters	: Fisher, Shreyas-Barton, Masoneilan (Dresser Industries), Forbes Marshall, Marsh-Bellofram, MIL controls, Watson Smith, YOKOGAWA
33.	Smart positioner	: Fisher, Masoneilan (Dresser Industries), Siemens, Samson Controls, Metso, Flowserve (Valtek), Yokogawa
34.	Solenoid Valve	: Herion, Burkert, Rotex, Asco, Avcon, Festo, Precision Instruments, IMI Norgren
35.	Air filter regulator	: IMI Norgren, Placka, Schrader-Schovill, Asco, Fisher
36.	Fittings (compression & pipe) & valves	: Swagelok, Parker, Excel-Hydro-pneumatics, Hylok, Fluid Control, DynaFluid, Flowtech
37.	SS Impulse Tubes & CS Impulse pipes	: Sandvik, MJ Patel, Noble Tubes, Allied Steel, SAIL Maharastra Seamless (P) Ltd, Reliable Steel (Reliable Pipes & Tubes ltd).
38.	Junction box (other than FF/Profibus)	: Rittal, FCG, Baliga, Ex-Protecta, P&F, Protocontrol
39.	Junction box (FF/Profibus)	: P&F, Turck, Phoenixcontact, Siemens
40.	Instrumentation Cable (Screened, paired, triad-signal, control, power etc.) (other than FF/Profibus/ Modbus)	: Delton, Thermopads, KEI industries, Lapp cables, Cords cables, Elkay Telelinks, TCL Cables, BELDEN, KEC, Insucon, Thermocables, Ocean cables, Pagoda cables, Special Cables Pvt. Ltd.



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41.	Thermocouple Compensating Cable	: Toshniwal Cables, Delton, Cords cables, Lapp cables, TCL Cables, Thermopads, BELDEN, Temcon, Thermopads, Tempsens, Associated cables
42.	FF/Profibus/ Modbus cables	: BELDEN, LEONI, LAPP Cables
B.	<u>Control room Instrumentation</u>	:
1.	Distributed Control System (DCS)	: Yokogawa (Centum VP), Honeywell (Experion PKS +C 300), Emerson (Delta V/Ovation), ABB (800 XA), Siemens (PCS 7+ S7400H), Toshiba (nv series) (Masibus), Rockwell (Plant PAX), Foxboro- IA series, BHEL (METSO),
2.	Programmable Logic Controllers	ABB 880XA, SIEMENS S7-400H, GE FANUC 9PAC Rx/3i, Rockwell Automation L-73, Schneider (Quntum)
3.	Digital Indicator	: Pyrotech Electronics, Masibus Instruments, Honeywell, TIPL, Yokogawa, Forbes Marshall, Ashe Control
4.	Bargraph Indicator/ Totaliser	: Masibus Instruments, Pyrotech Electronics, Yokogawa, Honeywell, Ashe Control
5.	Recorders (Chart Less)	: Yokogawa, Chino, Honeywell, Siemens, ABB.
6.	Microprocessor based controller	: Yokogawa, Honeywell, Fuji, Toshiba, Foxboro
7.	Digital scanners	: Micro systems, Masibus Instruments, Procon, TIPL
8.	DC Power Supply Unit	: Aplab, Phoenix, Elnova, Siemens, Schneider, Pepperl & Fuchs, MTL, Cosel
9.	IS Interface/Zenner Barrier	: Pepperl & Fuchs, MTL, Stahl, DEHN



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10.	Signal isolators	: Pepperl & Fuchs, MTL, Yokogawa, Phoenix, Radix
11.	Annunciation system	: Procon, Micro Systems & Controls, Minilec, Pyroelectric, MB controls & Systems, DIGICONT
12.	Instrument Panels/ Cabinets/ Control Desk	: Rittal, Pyrotech, Hoffmann
13.	Control room / Modular Control desk Desk/Furniture	Cosmos Media products Pvt.Ltd, Harmony systems, Pyrotech work space solution Pvt.Ltd, Godrej & Boyce Manufacturing, OTS Office tech system Pvt. Ltd, Chemi control & Instrumentation Pvt.Ltd.
14.	Control room Interior	Evan Console, Home Decore, PyroTech work space Solution Pvt.Ltd., Temflow, Winsted
C.	<u>Analytical / Special Instruments</u>	:
1.	Gas analysis Instruments (including CEMS)	: ABB, Emerson, Siemens (Adage), Sick, Fuji, Yokogawa, Servomex, Fuji (AICPL), Forbes Marshall
2.	Gas analysis components	: Besides the following make, components of OEM supplier of analyser, can also be considered <ul style="list-style-type: none"> ➤ Solenoid valve: Herion (Germany), Burket (Germany), GEMU ➤ Sample gas Pump & Peristaltic Pump: KNF (Germany), ASF Thomas (Germany), Buhler, Charles Austin ➤ Rotameter/Purge Rotameter: Krohne (Germany), FPR (Austria), ABB (Germany) ➤ Probe Filter: SS Thyssen (Germany), Schumacel (Germany), ABB (Germany) ➤ Heated sample tube- prefabricated: Thermon (USA), Thermopads ➤ Condensate monitor: Buhler ➤ PTFE tube & PVDF fittings: Emtechnik (Germany)



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		<ul style="list-style-type: none"> ➤ SS tubes: Sandvik ➤ SS tubes fittings & valves : Swagelok, Parker ➤ Pressure gauge: WIKA ➤ PLC/Microprocessor based control system: Rockwell, ABB, Siemens, Yokogawa
3.	Stack Flow meter (Ultrasonic/ IR type)	: Siemens (Adage), Sick, Forbes Marshall (Codel), Fuji, Teledyne, Thermo-scientific
4.	Gas Detectors including portable detector	: Beiler & Lang (CO-Monitor), Draeger, MSA, Oldham (Industrial Scientific Corporation), Detronics,
5.	Dust Monitor/ SPM analyser	: Durag, Codel (Forbes Marshall). Sick, Siemens (Adage)
6.	Calorific Value analyzers/ Woobe Index meter	: Reineke, Union, Yokogawa, Siemens (Adage)
7.	Moisture Analysers (on line air/ gas)	: Foxboro, Bartec, GE-Panametrics
8.	ORP/PH/ Conductivity meter / Transmitter	: Emerson, Forbes Marshall, Yokogawa, ABB, HACH
9.	BOD/COD/TSS analyzer	: Emerson, Forbes Marshall, HACH, Yokogawa, ABB, Honeywell, Teledyne
10.	Dissolved Oxygen analyzer	: Forbes Marshall, Yokogawa, HACH, Emerson
11.	Turbidity meter	: Forbes Marshall, Yokogawa, ABB
12.	Electronic Boiler drum level indicator	: Hitech, Hydrastep (Solatron), BHEL, Yarway
13.	Vibration sensors/ transmitters	: GE Bentley Nevada, IRD (Mechanalysis India), Bruel & Kjaer, Schenck-Avery, SPM Instruments, SKF, Shinkawa, Forbes-Marshall, Rockwell Automation, Masibus



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14.	Vibration monitoring system (Turbo-supervisory system)	:	GE Bentley Nevada, IRD (Mechanalysis India), Bruel & Kjaer, Shinkawa (Forbes-Marshall), Rockwell Automation
15.	Infrared radiation pyrometer	:	Land, Raytek, Ircon, Keller HCW, Williamson, Chino, FLUKE
16.	Lightning / Surge protection device	:	P&F, MTL, DEHN
D.	Erection Contractor	:	Elmatics Engineers Pvt. Ltd., Paradigm Engineers and Consultants Pvt. Ltd., Konstelec Engineers Pvt. Ltd., Jasubhai Engineering Pvt. Ltd.
E.	<u>Testing & Calibration instruments</u>	:	
1.	4-1/2 Digit Digital Portable Multimeter	:	Fluke, Yokogawa, Philips
2.	Milli volt/ Milliamp Feed & Measure	:	Fluke, Yokogawa, Philips, Beamex, Druck, Scandura
3.	Portable Temperature Calibrator	:	Druck, Scandura, Beamex, Tempsens, Masibus, Nagman
4.	Portable Pressure Calibrator with pumps	:	Druck, Scandura, Beamex, Masibus, Nagman
5.	HART/ Fieldbus configurator	:	Emerson, Fuji, Honeywell, Yokogawa, Siemens
6.	Universal Calibrator	:	Druck, Scandura, Beamex
7.	Insulation Tester	:	Motwane, Fluke, Extech, Megger
8.	Digital Storage oscilloscope	:	Phillips, Hewlett Packard, Yokogawa, Tektronix, Aplab

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Sl. No	ITEM DESCRIPTION	LIST OF MAKES
9.	Soldering & Desoldering Station	: Q Max, Weller
10.	Vacuum Cleaner	: Eureka Forbes, BPL, Philips
11.	Tools & tackles	: Taparia, Everest
12.	Radiation Survey Meter/ Dosimeter	: Fluke, RAE Systems, Thermo Fisher Scientific, Thermo Electron Corporation, LudLum
13.	Test bench (Pneumatic/ Electronic)	: Masibus, Nagman, GE, Yokogawa

14.08 INFORMATION SYSTEM

Server Computers	:	IBM/HP/SUN/DELL
Client Computers (PC)	:	IBM/Lenovo/HP-Compaq/DELL
Network Equipment		
• Active components	:	CISCO
• Passive components	:	LUCENT/AMP
Application software including Process control models	:	Technology Supplier

14.09 HANDLING & HOISTING:

Sl. No.	Equipment	List of makes
01.	EOT crane (upto 25T capacity)	Unique, Fafeco, Kone, Mukund, Electromech, Tuobrofuruguson, Cranex, Brady Morris, Shivpra, Hebenkraft, Eddycranes
02.	Underslung crane	Electromech, Tuobrofuruguson, Cranex, Brady Morris, Eddycranes, Rewa, electrotherapy

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03.	Electric hoist	Cranex, Brady Morris, Eddycranes, Rewa, Indef, electrotherapy
04.	Elevator / lift	OTIS, OMEGA, Kone, ECE, ThyssenKrupp

14.10 MACHINE TOOLS:

Sl. No.	Equipment	List of makes
1	Centre lathe	HMT, Herbert smith, HEC, MCM
2	Hydraulic press m/c	Bemco, electro-pneumatic, ISGEC, KAWA, HMT
3	Shaping machine	Sagar, Jeet, Shimato
4	Bench Drill	Accuax, EIFCO, P&B, Thakoor
5	Radial Drill	HMT, Batliboi, HEC, Novisa, Luga
6	DE Pedestal Grinder	Grind Tools, GECO, Elmeco, epcogrinder
7	Power Hacksaw	ITL, Kasto, EIFCO
8	Portable Welding m/c	Ador welding, ESAB (welding equipment)
9	Marking Plate	Jash, Madras Gauge room (GRE), GMT

14.11 FIRE FIGHTING:

A) Mainline & Mechanical

i) Pipes (1239/3589)

1. TISCO, Calcutta
2. Jindal Pipes, New Delhi
3. Ajanta Tubes, New Delhi
4. Gujrat Steel Tubes
5. Khandelwal



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ii) Valve

a) **Globe Valves**

- 1) M/s BDK (New Delhi)
- 2) M/s Datre Corpn (Calcutta)
- 3) M/s KSB Pumps (New Delhi)
- 4) M/s L&T (New Delhi)
- 5) M/s Neco Schuber & Salzer Ltd. (New Delhi)
- 6) M/s Niton Valve (Mumbai)
- 7) M/s Ornate Valves (Mumbai)
- 8) M/s Panchavati Valves (Mumbai)
- 9) AV Valves Ltd.
- 10) BHEL (Trichy), India
- 11) Econo Valves Pvt Ltd, India
- 12) Fouress Engg (I) Ltd (Aurangabad)
- 13) Guru Industrial Valves Pvt Ltd
- 14) Leader Valves Ltd, India
- 15) NSSL Ltd. (Neco Schubert & SalzerLtd)
- 16) Oswal Industries Ltd, India
- 17) Petrochemical Engineering Enterprises, India
- 18) Sakhi Engineers Pvt Ltd
- 19) Shalimar Valves Pvt Ltd
- 20) Steel Strong Valves India Pvt Ltd, India

b) **Ball Valves**

- 1) Larsen & Toubro, Chennai
- 2) Virgo, Pune
- 3) Microfinish Valves, Hubli
- 4) Flow Chem, Ahmedabad

c) **Check Valves**

- 5) M/s Advance Valves Pvt. Ltd., Noida
- 6) M/s Aksons & Mechanical Enterprises, Mumbai
- 7) M/s Larsen & Toubro Limited (M/s Audco India Limited, Chennai)
- 8) M/s AV valves Ltd., Agra
- 9) M/s BDK engineering India Ltd., Hubli
- 10) M/s BHEL, OFE&OE Group, New Delhi



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- 11) M/s Datre Coroportion Limited, Calcutta
- 12) M/s Leader Valves Ltd., Jalandhar
- 13) M/s Neco schubert & Salzer Ltd., New Delhi
- 14) M/s Niton Valves Industries (P) Ltd., Mumbai
- 15) M/s Precision Engg.Co., Mumbai
- 16) Econo Valves Pvt Ltd, India
- 17) Fouress Engg (I) Ltd (Aurangabad)
- 18) KSB Pumps Ltd (Coimbatore), India
- 19) NSSL Ltd. (Neco Schubert & SalzerLtd)
- 20) Oswal Industries Ltd, India
- 21) Panchvati Valves & Flanges Pvt Ltd, India
- 22) Petrochemical Engineering Enterprises, India
- 23) Sakhi Engineers Pvt Ltd
- 24) Shalimar Valves Pvt Ltd
- 25) Steel Strong Valves India Pvt Ltd, India

d) **Plug Valves**

- 1) M/s Breda Energia Sesto Industria Spa, Italy
- 2) M/s Fisher Sanmar Ltd., Chennai
- 3) M/s Larsen & Toubro Ltd., New Delhi
- 4) M/s Nordstrom Valves, USA
- 5) M/s Serck Audco Valves, UK
- 6) M/s Sumitomo Corporation India Pvt. Ltd., New Delhi
- 7) M/s Z Corporation, Korea
- 8) M/s Hawa Valves (India) Pvt. Ltd., Mumbai
- 9) M/s Steel Strong Valves India Pvt. Ltd., Navi Mumbai

iii) **Flanges**

- 1) M/s Aditya Forge Ltd., Vadodara
- 2) M/s Amforge Industries Ltd., Mumbai
- 3) M/s CD Engineering Co., Ghaziabad
- 4) M/s Echjay Forgings Pvt. Ltd. (Bombay), Mumbai
- 5) M/s Echjay Industries Ltd., Rajkot
- 6) M/s Forge & Forge Pvt. Ltd., Rajkot
- 7) M/s Golden Iron & Steel Works, New Delhi
- 8) M/s JK Forgings, New Delhi
- 9) M/s Metal Forgings Pvt. Ltd., Mumbai



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- 10) M/s Perfect Marketings Pvt. Ltd., New Delhi
- 11) M/s Sky Forge, Faridabad
- 12) M/s S&G, Faridabad
- 13) Chaudhry Hammer Works Ltd, India
- 14) JAV Forgings (P) Ltd, India
- 15) Kunj Forgings Pvt Ltd, India
- 16) MS Fittings
- 17) R.N. Gupta & Co. Ltd, India
- 18) R.P. Engineering Pvt Ltd, India
- 19) Sanghvi Forgings & Engineering Ltd
- 20) Shri Ganesh Forgings Ltd., India
- 21) Uma Shankar Khandelwal & Co., India

iv) Fittings

- 1) M/s Commercial Supplying Agency, Mumbai
- 2) M/s Dee Development Engineers Ltd.
- 3) M/s Eby Industries, Mumbai
- 4) M/s Flash Forge Pvt. Ltd., Vishakhapatnam
- 5) M/s Gujarat Infra Pipes Pvt. Ltd., Vadodara
- 6) M/s M.S. Fittings Mfg. Co. Pvt. Ltd., Kolkata
- 7) M/s Stewarts & Lloyds of India Ltd., Kolkata
- 8) M/s Teekay Tubes Pvt. Ltd., Mumbai
- 9) M/s Pipe Fit, Baroda
- 10) M/s Sky Forge, Faridabad
- 11) M/s S&G, Faridabad
- 12) M/s Sawan Engineers, Baroda
- 13) Eby Fasteners, India
- 14) Leader Valves Ltd, India
- 15) R.N. Gupta & Co. Ltd, India
- 16) Exten Engg Pvt Ltd
- 17) Sivananda Pipe & Fittings Ltd
- 18) Tube Products Incorporated

v) Gaskets

- 1) IGP Engineers (P) Ltd., Madras
- 2) Madras Industrial Products, Madras
- 3) Dikson & Company, Bombay
- 4) Banco Products (P) Ltd., Vadodara



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- 5) Goodrich Gaskets Pvt Ltd
- 6) Starflex Sealing India Pvt Ltd, India
- 7) Teekay Meta Flex Pvt Ltd
- 8) UNIKLINGER Ltd

vi) Fasteners

- 1) Nireka Engg. Co. (P) Ltd., Calcutta
- 2) Precision Taps & Dies, Bombay
- 3) AEP Company, Vithal Udyoug Nagar
- 4) Fix Fit Fasteners, Calcutta
- 5) Precision Engg. Industries, Baroda
- 6) Echjay Forgings Pvt. Ltd., Bombay
- 7) Capital Industries, Bombay
- 8) Boltmaster India Pvt Ltd, India
- 9) Deepak Fasteners Limited, India
- 10) Fasteners & Allied Products Pvt Ltd, India
- 11) Hardwin Fasteners Pvt Ltd, India
- 12) J.J. Industries, India
- 13) Multi Fasteners Pvt Ltd, India
- 14) Nexo Industries, India
- 15) Pacific Forging & Fasteners Pvt Ltd, India
- 16) Pioneer Nuts & Bolts Pvt Ltd, India
- 17) Precision Auto Engineers, India
- 18) President Engineering Works, India
- 19) Sandeep Engineering Works, India
- 20) Syndicate Engineering Industries, India

vii) Welding Electrodes

- 1) For Mainline – Lincoln make
- 2) For Terminal – Lincoln & D&H or equivalent

viii) Fire Fighting Equipments

a) **Fire Extinguishers**

- 3) Avon Services (Production & Agencies) Pvt. Ltd., Bombay
- 4) Kooverji Devshi & Co., Bombay
- 5) Zenith Fire Services, Bombay



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- 6) Safex Fire Services, Bombay
- 7) Reliable (Fire Protection) India Ltd., Bombay
- 8) Brij Basi Hi
- 9) tech Udyog
- 10) Bharat Engg Works, India
- 11) Gunnebo India Ltd
- 12) Nitin Fire Protection Industries Ltd, India
- 13) Supremex Equipments, India
- 14) Vimal Fire Controls Pvt Ltd., India

b) Fire Hydrants, Monitors, Deluge Valve, Nozzles



- 1) Zenith
- 2) Minimax
- 3) Newage
- 4) HD Fire
- 5) Vijay Fire
- 6) Asco Strumech Pvt Ltd, India
- 7) Brij Basi Hi
- 8) tech Udyog
- 9) Gunnebo India Ltd
- 10) Nitin Fire Protection Pvt Ltd
- 11) Shah Bhogilal Jethamal & Brothers
- 12) Venus Pumps & Engineering Works

c) RRL Hose

- 1) Jayshree
- 2) Newage

d) Hoses

- 1) Ashit Sales Corporation, Bombay
- 2) Royal India Corporation, Bombay
- 3) Gayatri Industrial Corporation
- 4) Simplex Rubber Products Ltd., Ahmedabad
- 5) Zaverchand Marketing Pvt. Ltd., Baroda
- 6) Presidency Rubber Mill, Calcutta
- 7) The Cosmopolite, Calcutta
- 8) Simplex Rubber Products, Thane

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e) Hose Delivery

- 1) Chhatarya Rubber & Chemical Industries,
- 2) Nitin Fire Protection Industries Ltd, India

f) Fire Hose Accessories

- 1) Asco Strumech Pvt Ltd
- 2) Brij Basi Hi-tech Udyog
- 3) Gunnebo India Ltd
- 4) Shah Bhogilal Jethamal & Brothers
- 5) Vimal Fire Controls Pvt Ltd., India

g) Main pumps: KBL, KSB, M&P, Flowmore, Beacon Weir

h) Jockey pumps: KBL, KSB, M&P, Flowmore, Beacon Weir

i) Diesel engines: Kirloskar Oil Engines, Greaves, Cummins India

j) Motors: Kirloskar, Crompton, Siemens, ABB, Bharat Bijlee

k) “T” TYPE STRAINER

- 1) M/s Gujarat Otofilt, Ahmedabad
- 2) M/s Genius Filters & Systems (P) Ltd., Vishakapatnam
- 3) M/s Delta Filters & Separators (P) Ltd., Navi mumbai
- 4) M/s Multitex Filters (P) Ltd., New Delhi
- 5) M/s Bhagwati Filters (P) Ltd., Ahmedabad
- 6) M/s Patel Filters Ltd., Ahmedabad
- 7) M/s Industrial Filtration Services
- 8) M/s Forum Filters & fabricators, Ankleshwar
- 9) M/s Filtration & Separation, Kalpavruksh
- 10) M/s Grand Prix Fab. (P) Ltd., New Delhi

14.12 AIR CONDITIONING AND VENTILATION SYSTEMS:

Sl. No.	Item Description	Manufacturer
1	Tube axial fans /Propeller Fans	CBDIRECTOR, EFE, FLOW LINK, ALMONARD, ACCEL, KHAITAN, AEROVENT, ISEL, FLAKTWOOD, MARATHON, LM ENGG, F. HARLEY, SUBURBAN INDUSTRIAL WORKS, PATEL AIRFLOW, PASKO ENGG. PVT. LTD.,



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		SCINTILLANT PROJECTS, TURBOFLOW, INDVENT FANS, FMI, AEROCON CORP, LAXMI ENGG., AIR TECHNIKO, KRUGER, GREENHECK, VOLTER
2	Roof exhausters	CBDOCTOR, EFE, ACCEL, ALMONARD, FLOWLINK, INDFAN, AEROVENT, LM ENGG., F. HARLEY, PASKO ENGG., INDUSTRIAL FANS, AEROCON CORPORATION, LAXMI ENGG. WORKS, GANESH ENGG (VADODARA)
3	Panel filter for air	FMI, CADILLAC, CBDOCTOR, FILTECH (INDIA), SPECTRUM FILTRATION, ANFILCO, AAF
4	Split AC	VOLTAS, BLUE STAR, CARRIER AIRCON, LG, SAMSUNG, HITACHI,
5	Duct Insulation	U.P.TWIGA, LLOYDS, BAKELITE HYLAM, MALANPUR ENTECH, OWENS CORNING, PARAMOUNT
6	Pipe Insulation	BEARDSSELL, LLOYDS, THERMOWELL, PARAMOUNT
7	Vibration isolators	DUNLOP, EMERALD, GERB, GETZNER
8	Grills / Diffusers /Fire Dampers	RAVISTAR, DYNACRAFT, COSMOS, AIRFLOW, CARYAIRE, AIRMASTER
9	3 / 2 way Control Valve	HONEYWELL, JOHNSON CONTROLS, SIEMENS
10	Fabricated Duct	ZECO, RADIANT, NUTECH, SPIRO
11	Strip Heater / Pan Humidifier	ALCO HEATING, DAS PASS, RAPID CONTROL
12	VRF system	DAIKIN, MITSUBISHI, TOSHIBA, LG, VOLTAS, BLUE STAR, CARRIER, SAMSUNG, HITACHI
13	Air handling units	VOLTAS, BLUE STAR, SUVIDHA, CARRIER, CARYAIRE, ZECO, AIRFLOW, EDGETECH, ETA ENGINEERING PVT. LTD. , ZAMIL, ETHOS



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15.00 TECHNICAL PARTICULARS TO BE FURNISHED BY THE TENDERER

Sl. No.	Description	Parameters
A.	Gas Compressor	
1.	Make	:
2.	Model	:
3.	Type	:
4.	No. of Stage	:
5.	Driver Type	:
6.	Drive	:
7.	Direction of Rotation (Facing Driven End):	:
8.	Type of Inter/After Coolers	:
9.	Type of Cooling media	:
10.	Installation	:
11.	Capacity (flow rate),	:
12.	Suction Pressure, kg/cm ² (g)	:
13.	Suction Temperature, °C	:
14.	Discharge Pressure, kg/cm ² (g)	:
15.	Discharge Temperature, °C	:
16.	Compression Ratio	:
17.	Gas Temperature after aftercooler, °C	:
18.	Type of Capacity Control	:
19.	Mode of Start & Stop	:
20.	Density (Dry Basis), kg/m ³	:
21.	Compressibility Factor	:
22.	Ratio of specific heats (C _p /C _v)	:
23.	Corrosive/Erosive Elements	:
24.	Particle size of Erosive (if any)	:
25.	Compressor Noise Level	:
B.	Gas Compressor Driver Details	
1.	Make	:
2.	Model	:
3.	Type	:
4.	Type of Cooling media	:
5.	Installation	:
6.	Rating	:
7.	Voltage Level	:
8.	Phase	:
9.	Speed	:
10.	Driver Noise Level	:



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C.	Constructional/ Design Features of Gas Compressor		
C.1	Cylinder		
1.	No of Cylinders	:	
2.	Single Acting (SA)/Double Acting (DA)	:	
3.	Cylinder Bore/Stroke	:	
4.	Rotational Speed	:	
5.	Linear Average Piston Speed	:	
6.	Piston Displacement	:	
7.	Volumetric Efficiency	:	
8.	Cylinder Liner (Yes/No)	:	
9.	Type of Cylinder Liner: Dry/Wet	:	
10.	Clearance Pockets Yes/No	:	
11.	Max. Allow. Working Pressure, Cylinder	:	
12.	Max./Min Allow. Working Temp., Cylinder	:	
13.	M.A.W.P, Cylinder @ Amb. Temp.	:	
14.	Safety Valve Set Pressure, Cylinder	:	
15.	Helium Test Pressure, Cylinder	:	
16.	Hydrostatic Test Pressure, Cylinder	:	
17.	Cylinder Jacket Cooling Type	:	
18.	Cooling Media, Cylinder Jackets	:	
19.	Max. Allow. Working Pressure, Cyl Jacket	:	
20.	Hydrostatic Test Pressure, Cyl Jacket	:	
21.	Suction Nozzle Size/Rating/Position	:	
22.	Discharge Nozzle Size/Rating/Position	:	
23.	Suction Valve Number	:	
24.	Valve Lift/Area Per Valve	:	
25.	Average gas Velocity	:	
26.	Discharge Valve Number	:	
27.	Valve Lift/Area Per valve	:	
28.	Average gas Velocity	:	
29.	Type of Suction valve	:	
30.	Type of Discharge valve	:	
31.	Suction Valve Unloaders Yes/No	:	
32.	Clearance Pockets Unloaders Type	:	
33.	Piston Rod Diameter	:	
34.	Rod Reversal at Crosshead Pin (Min.)	:	
35.	Piston Rod Runout	:	
36.	Max. Allow. Rod Load	:	
37.	Tension	:	



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C.2	Frame		
1.	Frame Exposion proof Relief Device	:	
2.	Flame Arrestor Yes/No	:	
3.	Replaceable Crosshead Shoes Yes/No	:	
4.	Crosshead Guide Integral/	:	
5.	Maximum Frame Rating	:	
6.	Speed- Maximum/Minimum	:	
C.3	Cylinder Material		
1.	Stage	:	
2.	Cylinder		
3.	Liner		
4.	Piston		
5.	Piston Rings		
6.	Rider Rings		
7.	Piston Rod		
8.	Packing Rings		
9.	Valve Seats		
10.	Valve Stops		
11.	Valve Rings/Plates		
12.	Valve springs		
13.	Cylinder Head	:	
D.	Utility Consumption		
1.	Cooling Water, Flow (m ³ /hr) & Pressure kg/cm ² g	:	
2.	Instrument Air, Flow (Nm ³ /hr) & Pressure kg/cm ² g	:	
3.	Nitrogen, Flow (Nm ³ /hr) & Pressure kg/cm ² g	:	
4.	Power (Auxiliaries), (kW)	:	
5.	Power (Heaters), (kW)	:	
6.	Purge (Air or N ₂), Flow (Nm ³ /hr) & Pressure kg/cm ² g	:	
E.	Lubrication Data		
1.	Make		
2.	Type		
3.	Grade		
F.	Meteorological Data		
1.	Ambient Temperature (Max/ Min/ Design), °C	:	
2.	Relative Humidity (Max/ Min/ Design), %	:	



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3.	Rain Fall (Max/ Min/ Design), mm	:	
4.	Altitude	:	
5.	Seismic Zone	:	
G.	Applicable Codes and Standards		
1.	Gas Compressor	:	
2.	Gear Box, if any	:	
3.	Drive	:	
4.	Pressure Vessels	:	
5.	Oil Cooler	:	
6.	Piping	:	
H.	Instrument Air Compressor		
1.	Make	:	
2.	Model	:	
3.	Type	:	
4.	No. of Stage	:	
5.	Driver Type	:	
6.	Drive	:	
7.	Direction of Rotation (Facing Driven End):	:	
8.	Type of Inter/After Coolers	:	
9.	Type of Cooling media	:	
10.	Installation	:	
11.	Capacity (flow rate),	:	
12.	Suction Pressure, kg/cm ² (g)	:	
13.	Suction Temperature, °C	:	
14.	Discharge Pressure, kg/cm ² (g)	:	
15.	Discharge Temperature, °C	:	
16.	Compression Ratio	:	
17.	Compressor Noise Level	:	
I.	Air Drying Unit		
	Make	:	
	Model	:	
	Type	:	
	Capacity (flow rate),	:	
	Suction Pressure, kg/cm ² (g)	:	
	Suction Temperature, °C	:	
	Discharge Pressure, kg/cm ² (g)	:	
	Discharge Temperature, °C	:	
	Dew Point Temperature, °C	:	
J.	Air Compressor Driver (Motor) Details		
1.	Make	:	



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2.	Model	:	
3.	Type	:	
4.	Type of Cooling media	:	
5.	Installation	:	
6.	Rating	:	
7.	Voltage Level	:	
8.	Phase	:	
9.	Speed	:	
10.	Driver Noise Level	:	
K.	Diesel Generating Units		
	Make	:	
	Model	:	
	Type	:	
	Type of Cooling media	:	
	Installation	:	
	Rating	:	
	Voltage Level	:	
	Phase	:	
	Speed	:	
	Noise Level	:	
	Fuel	:	
	Fuel Oil Consumption	:	
	Lube Oil Consumption	:	

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16.00 COMPREHENSIVE OPERATION AND MAINTENANCE CONTRACT

16.01 General



The Tenderer shall be responsible for Operation and Maintenance of four (4) nos. Reciprocating type Natural Gas Compressors and their auxiliaries in the Natural Gas Compressor Station. This agreement shall take effect from the date of handing over of Natural Gas Compressor Station and shall remain in force for a period of five (5) years. The Operation and Maintenance personnel are required to be continuously deputed by the Tenderer in the Natural Gas Compressor Station for five (5) years and shall carry out the necessary activities as advised by the Purchaser's personnel. The spares and consumables as required for Operation and Maintenance for the period of five (5) years other than those mentioned in Clause No. 03.02/33 this specification shall be provided by the Purchaser.

16.02 Scope of Work

The Tenderer shall be responsible for the Operation and Maintenance of four (4) nos. Reciprocating type Natural Gas Compressors and their auxiliaries from the date of handing over of Natural Gas Compressor Station to Purchaser and shall perform all necessary services in a prudent & efficient manner as listed below:-

The scope covers Operation and Maintenance of all four (4) nos. Reciprocating type Natural Gas Compressors and their associated auxiliaries comprising of the following equipment:-

- a. Reciprocating type Compressors
- b. Drive motors of Reciprocating type Compressors
- c. Gas coolers
- d. Complete Lubrication system including Lube oil coolers
- e. Suction KODs and Discharge KODs
- f. Suction pulsation dampeners
- h. Suction Volume bottle, Discharge volume bottle for each stage
- i. Complete piping, valves with their actuators, strainers, drain pots from compressor suction to discharge
- j. Interconnected piping between compressors and various consoles/heat exchangers
- k. Couplings
- l. Complete Utility piping/other auxiliary piping connected to compressors

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- m. Local control panel with PLC
- n. Compressor Skid mounted instruments
- o. All field instruments from Compressor suction to discharge other than compressor skid.
- p. Flare system including burners, valves and complete flare piping upto flare stack.
- q. All LT motor drives of valve actuators from compressor suction to discharge.

The type of maintenance to be carried out shall be as follows:-

16.02.01 Routine Maintenance:

Change of lube oil, filter, other consumables and accessories etc. as required for uninterrupted and trouble free operation of the plant & equipment installed by the Tenderer.

16.02.01 Periodical Maintenance:

Health check for four (4) nos. Reciprocating type Natural Gas Compressors and their auxiliaries complete in all respect shall be carried out by the Tenderer at regular intervals as and when required to ensure uninterrupted and trouble free operation of the plant & equipment.

16.02.02 Preventive Maintenance:



Preventive maintenance as required for uninterrupted and trouble free operation of the (4) Nos. Reciprocating type Natural Gas Compressors and their auxiliaries to ensure availability of the plant & equipment at its rated capacity.

16.02.03 Breakdown Maintenance:

Maintenance required for attending failures of four (4) Nos. Reciprocating type Natural Gas Compressors and their auxiliaries to perform satisfactorily at rated parameters due to reasons what so ever.

The Tenderer shall depute experienced, qualified and skilled (certified by the manufacturer) manpower for operation and periodical, routine, preventive and breakdown maintenance work as required by the purchaser.

16.02.04 The preventive maintenance including capital repair shall be done by the Tenderer for

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the entire contract period. Subsequently, the yearly schedules, monthly schedules shall be prepared. Maintenance shall be combination of predictive, preventive and condition based.

- 16.02.05 Routine maintenance activities like checking of lubrication oil, cooling water system etc.
- 16.02.06 Lubrication schedules indicating quantity of lubrication shall be prepared by the Tenderer in consultation with Purchaser and fulfillment records shall be kept for further reference.
- 16.02.07 Periodical inspection of four (4) Nos. Reciprocating type Natural Gas Compressors and their auxiliaries shall have to be carried out as per the inspection plan, detailed equipment wise inspection check lists. The inspection reports are to be submitted every month to Purchaser. All defects noticed during inspection are to be rectified by the Tenderer immediately to prevent major outages. The check list shall be reviewed jointly by the Tenderer and Purchaser and modified as per requirement to ensure the healthiness of the equipment.
- 16.02.08 History records for all equipment to be maintained and handed over to Purchaser.
- 16.02.09 Log record is to be maintained for the activities carried out and recording the defects noticed / complaints received from the Purchaser. The Tenderer shall attend these complaints immediately and record the rectifications carried out in the same log book. On rectification of defects, the same shall be inspected and certified by Site-In-charge on a regular basis. All the records/documents are to be submitted to Purchaser on monthly basis for scrutiny and safe custody.

16.03 After Expiry of Term

After the expiry of term & extension of term as the case may be, the Tenderer shall organize a joint inspection with Purchaser and a joint inspection report/defect list of the equipment shall be prepared in accordance to the norms of manufacturer. The Tenderer shall eliminate all the defects (if any) before expiry of the contract. Tenderer shall hand over all technical documents, literature, Operation and Maintenance Manuals, tools & tackles and all the relevant records and documents.



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**NORTH EAST GAS GRID PIPELINE PROJECT
(PHASE - I)**

**TECHNICAL SPECIFICATION FOR
NATURAL GAS COMPRESSOR STATION**

VOLUME-II



PART-II (DRAWINGS)



MECON LIMITED

TS NO.: MEC/S/23UU/05/28/0001(Rev. 00)



JULY, 2022

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1.	Administrative building - ground floor plan	MEC/05/28/23UU/NGCS/TD/001, Sheet 1 of 1, Rev. 0
2.	Administrative building - first floor plan and elevation	MEC/05/28/23UU/NGCS/TD/002, Sheet 1 of 1, Rev. 0
3.	Canteen building – ground floor plan	MEC/05/28/23UU/NGCS/TD/003, Sheet 1 of 1, Rev. 0
4.	Canteen building - first floor plan	MEC/05/28/23UU/NGCS/TD/004, Sheet 1 of 1, Rev. 0
5.	Control room building – ground floor plan	MEC/05/28/23UU/NGCS/TD/005, Sheet 1 of 1, Rev. 0



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6.	Control room building – first floor plan	MEC/05/28/23UU/NGCS/TD/006, Sheet 1 of 1, Rev. 0
7.	Control room building – second floor plan	MEC/05/28/23UU/NGCS/TD/007, Sheet 1 of 1, Rev. 0
8.	Fire tender house – ground floor plan	MEC/05/28/23UU/NGCS/TD/008, Sheet 1 of 1, Rev. 0
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10.	Worker’s Rest room building -plans	MEC/05/28/23UU/NGCS/TD/010, Sheet 1 of 1, Rev. 0
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12.	Scooter and cycle parking	MEC/05/28/23UU/NGCS/TD/012, Sheet 1 of 1, Rev. 0
13.	Biometric security block - plans, elevation, schedules of openings	MEC/05/28/23UU/NGCS/TD/013, Sheet 1 of 1, Rev. 0
14.	Guard room – plans, elevation and schedules	MEC/05/28/23UU/NGCS/TD/014, Sheet 1 of 1, Rev. 0
15.	Gate complex – plans and elevation	MEC/05/28/23UU/NGCS/TD/015, Sheet 1 of 1, Rev. 0
16.	Guard room cum watch tower – plans and elevations	MEC/05/28/23UU/NGCS/TD/016, Sheet 1 of 1, Rev. 0
17.	Natural gas compressor station P&ID (typical for each compressor)	MEC/05/28/23UU/NGCS/TD/017, Sheet 1 of 1, Rev. 0
18.	Natural gas compressor station P&ID (typical for each compressor)	MEC/05/28/23UU/NGCS/TD/018, Sheet 1 of 1, Rev. 0
19.	Natural gas compressor station Process flow diagram (typical for each compressor)	MEC/05/28/23UU/NGCS/TD/019, Sheet 1 of 1, Rev. 0
20.	33kV & 6.6kV Basic Power Distribution Single Line Diagram	MEC/05/28/23UU/NGCS/TD/020, Sheet 1 of 1, Rev. 0
21.	Typical substation automation system architecture	MEC/05/28/23UU/NGCS/TD/021, Sheet 1 of 1, Rev. 0
22.	Typical LTPCCs (LTPCC-1&2) Single line diagram	MEC/05/28/23UU/NGCS/TD/022, Sheet 1 of 1, Rev. 0
23.	PLC Configuration Diagram	MEC/05/28/23UU/NGCS/TD/023, Sheet 1 of 1, Rev. 0
24.	Piping & instrumentation diagram for fire water system	MEC/05/28/23UU/NGCS/TD/024, Sheet 1 of 1, Rev. 0
25.	Drinking water scheme	MEC/05/28/23UU/NGCS/TD/025, Sheet 1 of 1, Rev. 0



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Sl. No.	Title	Drawing No.
26.	Clearance drawing for Underslung crane	MEC/05/28/23UU/NGCS/TD/026, Sheet 1 of 1, Rev. 0
27.	Clearance drawing for DG-EOT crane	MEC/05/28/23UU/NGCS/TD/027, Sheet 1 of 1, Rev. 0
28.	Clearance drawing for elevator	MEC/05/28/23UU/NGCS/TD/028, Sheet 1 of 1, Rev. 0
29.	Central Store	MEC/05/28/23UU/NGCS/TD/029, Sheet 1 of 1, Rev. 0
30.	Mechanical workshop	MEC/05/28/23UU/NGCS/TD/030, Sheet 1 of 1, Rev. 0
31.	Fire layout at compressor station	MEC/05/28/23UU/NGCS/TD/031, Sheet 1 of 1, Rev. 0
32.	General Layout for compressor station at Guwahati	MEC/05/28/23UU/NGCS/TD/032, Sheet 1 of 1, Rev. 0
33.	VFD with DOL bypass arrangement and isolator panel for HT compressor	MEC/05/28/23UU/NGCS/TD/033, Sheet 1 of 1, Rev. 0

