



**HPOIL GAS PRIVATE LIMITED CITY GAS DISTRIBUTION
PROJECT IN NAGALAND STATE GAS**

TENDER DOCUMENT

FOR

**ANNUAL RATE CONTRACT FOR SUPPLY OF ODORISATION
SKID AND CAMC FOR THREE YEARS IN THE STATE OF
NAGALAND GAS**

TENDER DOCUMENT NO. HOGPL/VCS/2025-26/C&P-NL/ARC/ODR/012

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TECHNICAL VOLUME



**ANNUAL RATE CONTRACT FOR SUPPLY OF
ODORISATION SKID AND CAMC FOR THREE YEARS
IN THE STATE OF NAGALAND GAS**



Energising Quality

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1.0 GENERAL

1.1 Minimum Product Requirement

HOGPL seeks to procure ODORISATION SKID and avail their Comprehensive Annual & Maintenance services for 03 years (excluding warranty period) to continuously odorize natural Gas supply to City Gas distribution System in the state of Nagaland GAs.

1.2 Vendor's Minimum Scope:

- a) ODORISATION SKID: Design, Engineering, Manufacturing, testing and supply of Fully automatic injection type ODORISATION SKID consisting of storage tanks as per the table below:

Item #	Description	Qty
1	1000 WL Capacity SKIDs (1 x 1000WL SS tank) at CGS in the state of Nagaland GAs	01

The SKIDs shall be provided with:

- 1000 Water Ltr. capacity Stainless Steel tanks with minimum 8 mm thickness,
 - Fully Automatic injection odorizing SKID,
 - Pneumatic panel/electrical pump panel,
 - Pressure transducer & Temperature transmitter device at pump discharge and downstream of PCV regulator.
 - Electronic Control SKID (ECU) and interconnecting tubing, valves, gauges,
 - Modems and software for remote communication, instrument/signal cables (with cable trays) up to 125 meters distance from the Control Room etc. and
 - Supervision of commissioning work involved.
 - Supply of Suitable Odorant Absorber (ABSORBENT 10 or equivalent) with handling & storing accessories (10 Kg in a suitable storage for each set of Odorant SKID).
 - Supply of calibrated concentration measuring device for odorant for O&M activity at purchaser site.
 - Odorant Tank shall be designed as per ASME sec. VIII Div. I (latest code edition shall be applicable).
- b) Delivery of ODORISATION SKID at HOGPL Store/site in the state of Nagaland GAs and its unloading at HOGPL store/ site.
- c) In case Loading and transportation of ODORISATION SKID from HOGPL store to site, then its unloading at site shall in the purchaser scope.
- d) Platform and civil work, trench work and cable laying, welding at site, etc. HOGPL shall arrange 220-240 V, 50 Hz, UPS power supply and 4 – 20 mA signal at Electronic Control SKID in the control Room. However, vendor shall submit the drawing of foundation for ODORISATION SKID.

1.3 Warranty Periods:

Vendor shall consider the warranty of odorized skid package for 18 months from date of supply and 12 months from the date of commissioning, whichever is earlier.

During warranty periods vendor shall provide competent manpower, odorant Initial fill along with spares and consumables required in case of any breakdown occurs, no separate payments shall made for the supply spares and deployment of manpower.

Vendor shall responsible for preventive maintenance checkup along with spares and consumables during warranty periods.

After expiry of the warranty period, the vendor shall provide on-site repair and comprehensive maintenance services for a duration of three (03) years during the post-warranty period. These services shall include the supply of all necessary Manpower, spares, consumables and make-up quantity of odorant required during the post warranty period shall supplied through milkman concept without any extra cost implication to HOGPL.

Final P&ID of ODORISATION SKID meeting all requirements shall be prepared by vendor and submitted along with the bid.

2.0 TECHNICAL SPECIFICATIONS

2.1 Specifications:

Design, engineering, manufacturing, testing, supply, installation & commissioning of ODORISATION SKID with Fully automatic odorant injection system for gas odorant depending upon the flow rate in natural gas pipeline shall be done by the vendor as per the specifications enclosed herewith and SOR and in line with the minimum requirements mentioned herein under ODORISATION SKID with Fully automatic odorant injection system for gas odorant depending upon the flow rate in natural gas pipeline. HOGPL will provide the provision for 02 injection probe in the steel pipeline and the balance scope will be of vendor.

Table-2.1: parameters of the odorizing SKIDs

S.N.	Parameter	Value	
1.	Flow rate	For 1000 WL	
		0.79 MSCMD Max.	
2.	Operating pressure @ dosing	19-35 barg Normal 49 barg Max.	
3.	Design pressure @ dosing	` 49 barg	
4.	Design Temperatures	0 – 60 °C	
5.	Operating Temperatures	0 – 60 °C	
6.	Ingress Protection	IP-65	

7.	Gas Odorant	75-80% TBM (Tert-Butyl Mercaptan) + 20-25% MES (Methyl Ethyl Sulphide) Also compatible with Ethyl Mercaptan / TBM + THT blends/ THT / TBM + TBM Blends.
8.	Flow rate of Odorant	To achieve a concentration of 5-42mg of odorant/SCM of natural gas at peak flow rate
9.	Power Supply	Single phase, 230V +/- 10% 50Hz, +/- 3% and compatible with solar panel and DC supply (24 V)
10.	Storage container (with level gauge)	a) 1000 liter (SS 304 tanks are Shell End Plus dish End both have 8 mm minimum thickness) Electronic level transmitter b) Electronic temperature
11.	Storage tank containment	Separate containment of 100% capacity of each of the odorant storage tank.
12.	Filtration/scrubber	Double/redundant filtration scrubber system shall be provided, as per PNRGB guidelines.
13.	Pneumatic/Electrical Pump Panel	Pump (1 main + 1 standby) with Electric/pneumatic motor with cabinet to be installed in hazardous area. Complete Pump body shall be SS316 Cabinet / tubing in Stainless Steel body. (Components resistant to Chemical attack from of the Odorizing liquids, to the elements and to those conditions specified in regulations regarding safety and Electrical equipment). Fully automatic operation all the time.
14.	Electronic Control SKID (ECU)	To be installed in safe area and with provision connected with Pneumatic / Electrical for remote operation pump panel ➤ Cabinet in Stainless Steel body ➤ Protection Class IP65
15.	Data Reading & writing	Local Operator Interface, RS-232/ RS-485 Modem for Odorized SKID-01 no. Modem for control room PC and Local / Remote Configuration software / SCADA software. <u>Controller Options:</u> Local interface, alarms, data logging/history, alarm logs, two-way communication for remote on-off and alteration in settings.
16.	Gas Flow input Signal	Analog, 4-20mA
17.	Line size	To be confirmed by the bidder during detailed Engineering
18.	Design pipeline rating	ANSI 300#
19.	End connection	All end connection at pipeline shall be 1" / ¾ "NPT female with Isolation valves.

20.	Tubing	All tubing shall be SS 316 and minimum of ½" size shall be clamped and routed in GI tray up to pipeline. For any end connection necessary adapter is in vendor's scope.
21.	Gas inlet tapping	1" or 3/4", tapping as per the Requirements of vendor.
22.	Injector Probe Tapping	1" or 3/4" (1 main + 1 standby)
23.	Assistance in Fill of Odorant	Assistance in filling of odorant in storage container till the expiry of AMC
24.	Size of ODORISATION SKID	4m x 2m Max

2.2 Special Notes:

- Explosion proof enclosures along all Ex-electrical components shall be provided, with PESO/ATEX/ERTL/DEKRA/CIMFR/KLPL approval will be acceptable.
- All Explosion proof enclosures and Ex-electrical components shall be valid PESO approval during bid submission.
- The injectors shall be positioned on a pipeline in the downstream section of the station.
- Odorant injection/pumping system shall be fully redundant with 100% standby capacity, as per PNRGB guidelines.

2.3 Instruction to the bidder:

- The aforesaid specifications cover the minimum requirement for the Design, Engineering, Manufacturing, testing Supply, installation & commissioning of complete ODORISATION SKID along with all accessories including all packaging, preservation, and transportation to HOGPL stores/site.
- In the event of any **conflict** between these specifications, datasheets, related standards codes etc., the vendor shall refer the matter to the purchaser for clarifications and only after obtaining the clarification should proceed with the manufacture of the items in question.
- Proper sizing and selection of the equipment are vendor's responsibility. Sizing calculations for these items shall be submitted to HOGPL for approval. However, this does not absolve the vendor of the responsibility for proper selection with respect to the fluid and its operating conditions.

Note: Process parameters for ODORISATION SKID are enclosed in the tender document. Vendor shall take single point responsibility for the design & performance of the ODORISATION SKID based on the data sheets and the specifications furnished and taking into consideration successful operation, safety as per the established International Standards for the ODORISATION SKID.

- In case bidder is not Original Item Manufacturer (OIM), he shall furnish confirmation letter from OIM that their product can be marketed through the bidder and they stand guarantee for any manufacturing defect / non-performance found during the operation & guarantee period.

3.0 STANDARD AND CODES

Mechanical Equipment shall generally be designed in accordance with the relevant Institute of Gas Engineers (IGE) codes and the following principal codes of practice

ASME Boiler and Pressure Vessel Code

Section-V	:	Non-destructive examination
Section-VIII	:	Pressure Vessel. Division-1
Section-IX	:	Welding and brazing qualifications

American National Standard Code

ANSI/ ASME B16.5	:	Flanges and Flange Fittings
ANSI/ ASME B31.8	:	Gas Transmission and Distribution Systems

American Petroleum Institute

API RP 520	:	Parts-1 & 2, Design, and installation of pressure relieving systems in refineries
API RP 521	:	Guide for Pressure Relief and Depressing Systems
API RP 550	:	Manual on installation of refinery instrument and control systems

API 6D	:	Specification for pipeline valves, end closures and swivels
API 5L	:	Specification for Piping

British Standard Specifications

BS 449	:	Structural Steel Work
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Instrumentation

Instrumentation shall generally be in accordance with the applicable sections of the following principal codes of practice:

BS 1041	:	Code for Temperature Measurement
BS 1042	:	Code for Measurement of Fluid Flow in Pipes
BS 5501	:	Part-1, Electrical apparatus for potentially explosive atmospheres
API RP 550	:	Manual on Installation of Refinery Instrument Control Systems
API RP 521	:	Grade for Pressure Relief & Depressurizing Systems
ISA A5.1	:	Instrument Symbols & Identification
BS 2765	:	Thermo-wells
BS 1259	:	Intrinsically safe Electrical Apparatus and Circuits
BS 5345	:	Part 1-Selection, Installation and Maintenance of Electrical Apparatus & Circuits
BS 5490	:	Specification for degree of protection provided by enclosures.

4.0 SCOPE OF WORK

Vendor's scope shall include complete design, engineering, manufacturing, testing, supply, & commissioning of ODORISATION SKID as per the schematic drawing, data sheets and other specifications enclosed herewith.

4.1 Transportation

Transportation & unloading to HOGPL's stores/site in the state of Nagaland GAS is included in Bidder's scope. Loading & Transportation from HOGPL's store to HOGPL's site in the state of Nagaland GAS of ODORISATION SKID on ODORISATION foundation shall be done by HOGPL).

4.2 Supply, Installation & commissioning.

- A. Supply and installation of tubing, instrument cables, power cables and their accessories which is limited up to the length of 125 mtrs. Any cost for extra cable length of more than 125 mtrs. Shall be borne by HOGPL.
- B. Supply of drawings, documents and P&ID
- C. Training of field staff.
- D. Assistance during filling of odorant supplied by HOGPL into ODORISATION and demo of successful working of ODORISATION without any extra cost implication to HOGPL.

ODORISATION SKID shall comprise, but not limited to, the following items:

- a) Base SKID with SS 304 Odorant Tanks, Pneumatic/ Electrical pump panel, Electronic Control SKID (ECU) with
 - i. Modem will be installed only at ECU, which will be in control room. However, the dual SIM modem with latest communication technology compatible with SCADA will be required.
 - ii. Read & write Local / Remote Configuration/ SCADA software.
 - iii. SS 304 Odorant Tanks,
 - iv. Pneumatic/Electrical Pump panel,
 - v. Electronic Control SKID (ECU) with GSM/GPRS Modem to read & write through remote communication & SCADA located in control room.
- b) There should be drip tray on the bottom of each tank with capacity minimum **110% volume** of each tank capacity.
- c) Pneumatic/ Electrical pump (**1 main + 1 standby**) panel to be installed in hazardous area. Cabinet of stainless-steel body.
- d) Complete Piping, fittings, Valves, gauges, relief valves, expanders, reducers, vent arrangements etc. as required to make the ODORISATION SKID complete in all respects.
- e) Piping, Tubing (SS316), Fittings & Valves (SS316) etc. as required for the installation of instruments etc. Odorant filler header with twin inlets (01 Working +01 Standby).
- f) Steel Structure for station and Supports, Platform and maintenance access as required.
- g) Special installation tools as required for normal operation and maintenance requirements.
- h) Commissioning spares, as required.
- i) All the nut and bolts use in fabrication of Odorizing SKID will be of Stainless Steel only.
- j) **02 No.** of injection nozzle (**1 Working + 1 standby**). Size / dimensions of injection points not known. Hence, vendor may be asked to replace the injection nozzles to suit the HOGPL's requirement at the time of installation without any extra cost implication to HOGPL. HOGPL will provide the provision for 02 injection probe in the steel pipeline and the balance scope will be of vendor.

- k) Vendor shall follow the guidelines requirements for **PNGRB circular- F. No. INFRA/T4S/SC-6/4/18 and G.S.R. 612(E)-Sch.-1G & 1E** requirements during operation and maintenance activities at site with followed by HOGPL HSE requirements and other statutory norms.
- l) Vendor shall supply hand measuring instruments for odorant concentration analysis at site and the result can be read off directly in mg/m³ or lbs/MMCF.
- m) Supply of **Odorant concentration analysis instruments shall be as below specification:** -
- a) Rechargeable NiMH battery pack 4.8 V.
 - b) Charging station 230 V, 115 V, 12 V connections available.
 - c) Inlet pressure 22 mbar (0.3 psi/8" H₂O) or via rotameter up to 10 bar (145 psi)
 - d) Measurement duration: 2-10 min
 - e) Operating temperature -10 to +40 °C
 - f) Internal memory for 254 measuring points
 - g) NABL/OEM Calibration certificates- Required
 - h) Measuring range-0 to 100 mg/m³
 - i) Resolution of digital display-0.1 mg/m³
 - j) Measuring accuracy- +/- 5% of reading plus +/- 0,5% of full scale.
- n) Supply of **Absorbent-10** for suitable Odorant absorber as a neutralizer for spillage handling of Odorant. Each will be in 10 Kg containers for the Application of absorbent granules.
- o) **ODORISATION Electronic controller SKID shall be provided with inbuilt GSM/ GPRS modem.** Vendor shall demonstrate the communication (read & write) from Master control room (MCS) to ODORISATION control SKID installed at site. The vendor shall provide the necessary accessories required for proper GSM/GPRS communication.

4.3 Repair & Maintenance

Vendor shall quote separately for Repair & Maintenance Services of his ODORISATION (spares included in vendor's scope without any extra cost implication to HOGPL) for a period of 03 years after expiry of warranty period.

5.0 GENERAL PROCESS PARAMETERS:

- 5.1. Completeness of the ODORISATION SKID to be ensured in all respects to meet the requirements of the ODORISATION SKID. Vendor shall furnish Bill of Materials for the ODORISATION SKID and ensure its completeness to meet the functional requirement.
- 5.2. It is anticipated that the natural gas feed composition, flow rate and pressure will be fluctuating. Hence, supplier should design the Odorizing System with optimum degree of flexibility, reliability, and operability to accommodate the varying composition of feed, other unexpected contaminants, flow rate and pressure.
- 5.3. The Odorizing System facilities should consist of standardized modules, which are assembled into a complete system. Each system should be designed in packaged frame, housing etc. The design life of the Odorizing System should be minimum 30 years.



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- 5.4. The entire odorizing system shall be designed for all type of odorants such as (i.e. 75-80 % TBM (Tert – Butyl Mercaptan) + 20-25% MES (Methyl Ethyl Suphide)/Ethyl Mercaptan/ TBM + THT blends / THT / TBM + TBM blends. The vendor shall recommend the necessary changes in the system for the particular alternate odorants.
- 5.5. The vendor shall provide suitable structural shade made of suitable materials for the storage tank & fields SKID only – all sides open.
- 5.6. Pneumatic/Electrical pump panel, Control Room mounted Electronic Control SKID. The signal & control cabling between the panels is in the bidder's scope.
- 5.7. Purchaser will provide 230 V AC power supply with coming cable for ODORISATION Control SKID. The termination of power supply cable at UPS of ODORISATION Control SKID is in the Bidder's scope. However supply of UPS will be in the scope of HOGPL.
- 5.8. Bidder has to provide Surge protection device in 230 V AC UPS supply provided by the client. This should be installed at the JB where incoming power supply will be terminated. Any problem in the input supply, the equipment should be protected. The surge protection device shall be pluggable and testable with thermal disconnection and indication facility. It should be for input power supply as per IEC standard IEC -61643-12. However supply of UPS will be in the scope of HOGPL.
- 5.9. Vendor to confirm that the supplied Electronic Control SKID are suitable with the above power supply and indicate the maximum and minimum tolerable values of voltage for safe operation of Odorizing System. Vendors must include suitable voltage conditioning system (Voltage Stabilizer) in their scope to prevent failure from voltage fluctuations if supplied equipment need the same.
- 5.10. Vendor shall provide suitable reducer connection for both inlet and outlet connection of odorizer skid package.
- 5.11. All Solenoid operated valves, Pressure transducer & Temperature transducer shall be logically controlled through ECU panel SKID under fail safe mode to protection of skid package SKID.
- 5.12. Electronic Control SKID should be provided with a Liquid Crystal Display (LCD) for ongoing Flow Monitoring, Operations Modes etc. It should be easy to read lighted display. Displays must remain active for at least 15 minutes after power failure. Necessary battery backup shall be provided in the system. Electronic SKID shall have the external keypad for entering the data and provide password protection for unauthorized use.
- 5.13. Mounting of Electronic Control SKID shall be wall mounted. Necessary provision for proper mounting shall be provided. Cable entry shall be from bottom, therefore necessary removable Gland Plate with matching hole as per supplied Cable glands shall be provided.

- 5.14. Odorizing System should not shut off in case of Failure of throttling valve / regulator or Low flow.
- 5.15. The Electronic Control SKID should be capable of storing odorizing data and such should be downloaded frequently into another portable computer to store the data. In order to meet the above requirement, 2 nos. of RS 232 Serial communication ports shall be included in the Electronic Control SKID. One Port will be utilized for Portable Computer and another port will be utilized for future SCADA application. For this application, Vendor shall include in the scope all relevant software, together with the license, compatible to Microsoft Windows 10/11 software.
- 5.16. Pipe work should be designed, tested and installed to ensure its safe operation at the worst conceivable conditions of flow, pressure and temperature.
- 5.17. All tubing work should be of SS 316 fully annealed (Bright annealed) seamless conforming to ASTM A269 – SS 316 or above required. All tubing shall minimum of ½" size shall be clamped and routed in GI tray up to pipeline. For any different end connection necessary adopter is in vendor's scope. The piping / tubing, valves, fittings shall be as per approved Vendor list which enclosed separately. The system should be "go-no-go" gauge-able to demonstrate that fittings are properly tightened. Wherever possible; valves and control devices should be of same end connector. The number of fittings used should be minimized. The Supplier should ensure that personnel assembling the pipe work should be competent in the system employed.
- 5.18. The preferred valve types for isolation are ½" turn ball valves. Such valves have similar material to the tube they are attached to. Ball valves must be from Swagelok, Parker and be appropriately selected frequency of use. Ball seats / Peek seats must be suitable for natural gas operation of the gas composition indicated.
- 5.19. Valves and fittings subject to corrosion must be either inherently resistant, or be coated with a corrosion inhibiting paint or surface treatment.
- 5.20. Vent connection from the Odorizing SKID will be with SS Flame arrester, Valves, protection cover with odorant neutralization system (as per the scheme suggested by the bidder). The vent stack shall be 3 meter above the foundation top Level. A scrubber must be installed in Gas / Vapor vent line, to ensure odour is in control during venting.
- 5.21. The Supplier should specify the hazardous area in accordance with the IS 5572. All electrical equipment cabling and earthling should be appropriate for the zone in which it is fitted, and all cables passing from the hazardous to safe area should be equipped with appropriate barriers where necessary.
- 5.22. All Instruments should be suitable for an area classification of "Class1, Division I, Group C and D as per NEC" Or "Zone 1, Group IIA/ IIB as per IS / IEC".

- 5.23. All Odorizing SKID mounted transmitters & temperature element should be intrinsic safe "extra" as per IEC 79-Iii and solenoid valves, switches and related junction boxes should be flame proof "Exd" as per IEC 79-1. Other special equipment's instruments, where intrinsic safety is not feasible or available, should be flame proof as per IEC – 79-1. Flying leads from any of the instrumentation items are not acceptable. The Electronics of the Odorizing SKID shall not be open and shall be provided within a suitable enclosure
- 5.24. For the ODORISATION auto Mode operation, flow signal will be provided as Pulse signals or analogue 4 -20 M-Amp./from existing Flow Computers / Electronics Volume correctors / Metering device by client.
- 5.25. Vent connection from the Odorizing SKID will be with SS Frame arrester, Valves, protection cover with odorant neutralization system (as per the scheme suggested by the bidder). The vent stack shall be 3 Meter above the foundation top Level.
- 5.26. The gas inlet at define pressure will be provided from the metered section at any point for ODORISATION (Size 1" / ¾" tapping). Any pressure difference and pressure reduction if required for inlet gas to odorizing system shall be the responsibility of the bidder.
- 5.27. All the necessary Valves / RO etc. required to be mounted in the main pipeline shall be provided with companion flanges, necessary gasket, and bolts complete ready to installed condition. The bidder shall inform the scheme and the space requirements along with offer.
- 5.28. All the necessary Valves / RO etc. required to be mounted in the main pipeline shall be provided with companion flanges, necessary gasket, and bolts complete ready to installed condition. The bidder shall inform the scheme and the space requirements along with offer.
- 5.29. If more than one inlet Tapping is required then the client will provide only tapping in the pipeline and the necessary isolations (valves etc.) will be in the Scope of Bidder. Bidder shall provide the minimum distance to be maintained between the tapings. HOGPL will provide the provision for O₂ injection probe in the steel pipeline and the balance scope will be of vendor.
- 5.30. Onsite Training of Purchaser's Personnel for Odorant Handling, Re Filling, Operation & Maintenance, safety & general educational awareness program for odorizing, emergency & contingency plans etc. of the Odorizing System shall be provided by the bidder. Training procedure & plan has to be submitted, to be completed before final commissioning and handing over system to client.
- 5.31. Bidder shall categorically confirm all the clauses of Job specification & Technical Specifications in the offer.
- 5.32. Any deviation shall be indicated with proper reasoning and if necessary, with supporting documents.
- 5.33. Bidder shall furnish all the drawings and documents listed in the respective section along with offer for proper evaluation.



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- 5.34. All wetted equipment's should have isolation valves in up-stream & down-stream.
- 5.35. The bidder shall provide necessary manpower, tools & tackle, transport, communication, cranes, scaffolding etc. required for simultaneous working at any site or more than one site to suit overall erection program within the scheduled time.
- 5.36. All safety and warnings notices, barriers, padlocks etc., required during installation testing and commissioning for the safety of all site personnel and the bidder shall also provide equipment.
- 5.37. Bidder shall be responsible for Receipt of material, unloading, loading, shifting and Storage of material as per manufacturer's recommendation, Watch and ward of material at site.
- 5.38. All items in the ODORISATION SKID shall be properly supported to avoid vibration. Vendor, if required, shall also supply special supports.
- 5.39. The packaged assemblies (channel mounted) shall include all interconnecting piping, valves, inlet and outlet manifolds, control equipment and components, and all other necessary components required to deliver a complete operational system.
- 5.40. The ODORISATION SKID shall be complete in all respect, ready for installation and commissioning at the required site. There shall be minimum work to be done at site. All field-mounted instruments shall be supplied loose to avoid damages of the same during transportation of the skid.
- 5.41. All instruments on the ODORISATION SKID shall be easily accessible.
- 5.42. The odorant filler header with 02 inlets (01 active + 01 standby) shall be designed and kept of size min (1" dia.) such that no trouble is experienced during operation of odorant refilling.
- 5.43. The installation should be designed to maintain the maximum desired odorant concentration at the maximum designed gas flow rate at the lowest expected inlet pressure and designed outlet pressure of the station.
- 5.44. All Piping system shall be designed in accordance with ASME/ANSI B31.8- Gas Transmission Distribution piping system. Line pipe used in the construction of the skid shall be manufactured and supplied in accordance with API 5L B grade and shall be procured from certified API manufacturers. All 316 material shall be as per codes provided. Materials of 300# rating shall be used.
- 5.45. Gas velocities in pipe work must not exceed 20 m/sec across ODORISATION SKID and 25m/sec downstream of ODORISATION SKID when the maximum flow rate occurs at the lowest expected inlet pressure.

- 5.46. Commissioning spares as required shall be included as part of the offer.
- 5.47. The pressure relief valves as indicated shall be vented 3m above the top of the ODORISATION SKID.
- 5.48. The governing components should be designed not in isolation but as a single installation. Normally both should be sized for same load and consideration to be given regarding the effect that each may have on the other.
- 5.49. The construction of the ODORISATION SKID shall be such that there will be no gas/odorant bleeding in normal operation mode.
- 5.50. Vendor shall confirm that the noise level for ODORISATION SKID is within 65 dBA. In case noise level is 65 dBA, Vendor shall provide noise treatment to limit the noise level and include Silencers or Expanders as required in the scope of supply.
- 5.51. Closing time of all valves shall be less than 1 seconds for all sizes of the valve. Actual closing time of the valve shall be furnished with the quotation/offer.
- 5.52. The allowable tolerance in the set pressure is ± 0.14 kg/cm² for the pressure relief valves.
- 5.53. The equipment like pressure regulators/ slam shut valves etc. which are likely to be tripped shall always be with 100% redundancy. i.e. (01 active + 01 Standby).
- 5.54. ODORISATION SKID instruments mounted on the channel shall be suitable for installation in tropical hot and humid climate considering:
- | | | |
|-------------------|---|-------------------------------|
| Temperature | : | 60 °C (Max.) |
| Rel. Humidity | : | 58% (Min.) 94% (Max.) Maximum |
| Wind Velocity | : | 120 mph (Max.) |
| Rainfall | : | Monsoon Type |
| Earthquake factor | : | 0.5 G |
- 5.55. ODORISATION electronic controller SKID shall be provided with inbuilt GSM/GPRS modem with Ethernet connectivity.
- 5.56. Vendor shall demonstrate the communication (read & write) from HOGPL's control room to ODORISATION Control SKID installed at site. The vendor shall provide the necessary accessories required for proper GSM/GPRS communication at both ends (ODORISATION and control room).



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- 5.57. There must be mass flow meter installed in discharge line of odorant through pump to measure actual odorant discharge hourly, daily, monthly & Daily.
- 5.58. Mass flow meter reading data to be available on ECU and also it should be transfer on remote server & SCADA
- 5.59. For the ODORISATION auto Mode operation flow signal shall be provided in the form of analogue 4-20 mA / from each existing Flow Computers/ metering device by client. The metering system is in dual redundant mode (Two Metering stream). Hence the offered Electronic Control SKID is able to accept two nos. of 4-20 mA signals corresponding to instantaneous flow rate from each flow computer. Electronic Control SKID should be able to process the flow signals (4 to 20 mA) from two meters simultaneously. If the flow has been changed from stream 1 to stream 2 (or if both the stream operates), the ECU should recognize the stream changes through totalizer or signal adder. Also, ECU should display the gas flow of two streams separately. Also, installation of Analog/digital signal barrier is in vendor scope.
- 5.60. Odorizing System should not be shut off in case of: a. Power failure, b. Low flow, c Failure of any field instruments (Transmitters, temp. element, etc.).
- 5.61. Supply of Suitable Odorant absorber (Absorbent 10 or equivalent) as a neutralizer for spillage handling of odorant. Each will be in 10 Kg containers.

6.0 ODORANT LOADING / UNLOADING SYSTEM:

- 6.1 Odorant loading / unloading will be as per the Milkman concept with full responsibility of vendor. However, Vendor shall provide Odorant Manual Loading / Unloading System for the filling of Odorant during urgency in to the Storage Containers with proper safety features and with necessary connecting Hose & connector / coupler should be provided and shall be suitable for uses in Hazardous area.
- 6.2 After expiry of the warranty period, the vendor shall provide on-site repair and comprehensive maintenance services for a duration of three (03) years during the post-warranty period the make-up quantity of odorant required during the post warranty period shall supplied through milkman concept without any extra cost implication to HOGPL.
- 6.3 Vendor shall provide detail procedure and the arrangement for filling the Container with Odorant. It is the responsibility of the Vendor to fill the odorant (to be supplied by Vendor for first time filling) in Container/ tanks at site during final commissioning. The Handling, transportation, storage, filling, and final commissioning shall be in Vendor's scope.
- 6.4 Vendor shall Supply "Active Carbon Saw Dust" & "Sodium Hydrochloride" for Odorant 10 Kg each in Container for Odorant and neutralizer for spillage handling of Odorant. The container shall be suitable for handling and Storing of these Chemicals for uses.

- 6.5 ODORIZING system should have the provision of automatic washing in order to prevent smell during dismantling of equipment's for maintenance i.e. sending odorant from the system equipment's, Tubing's etc. back to odorant tank
- 6.6 It is the responsibility of the Bidder to fill the Odorant in tanks at site during final commissioning. Necessary authorization letter may be issue by the purchaser for procurement of Odorant from authorized supplier / agency. The handling, transportation, storage, filling and final commissioning shall be in Bidder's scope.
- 6.7 Purchaser will provide 230 V AC power supply with incoming cable for Odoriser Control Unit. The termination of power supply cable at UPS of Odoriser Control Unit is in the Bidder's scope.
- 6.8 Gas actuated operation of Solenoid Valve should not be considered, 24 V DC supplied intrinsically safe certified SOV shall be used.
- 6.9 For Odorant Refilling/Top up purpose suitable quick release coupling shall be provided with odorization skid.

7.0 STESTING AND INSPECTION AT VENDOR'S WORKS

All materials and equipment shall be factory tested before shipment in the presence of Purchaser's representative. No material shall be transported to site until all required tests have been carried out and equipment is certified as ready for shipment. Acceptance of equipment or the exemption of inspection or tests thereof, shall in no way absolve Supplier of the responsibility for delivering equipment meeting the requirements of the specifications.

Following tests shall be included:

- 7.1 Before the fabrication, the thickness of the materials used for odorant tanks shall be witnessed by HOGPL's representative/TPI.
- 7.2 Factory certificates of qualification of welder and welding procedure for SS316 by a qualified and reputed third party
- 7.3 Test certificates shall be provided for self-actuated equipment, valves, regulators, gauges etc. and for all piping/ valves of ODORISATION SKID.
- 7.4 Factory certificates of metal sheets used for tanks fabrication and conformity to design verification.
- 7.5 Factory certificates of radiography of all tank welding.
- 7.6 Testing to demonstrate set point accuracy and actuation time for all self-actuated valves.
- 7.7 Calibration certificate for pressure relief valve for set pressure.
- 7.8 Seat tightness test for Pressure Regulators and pressure relief valve.

- 7.9 Test certificate for PGs and certificates from statutory bodies wherever applicable.
- 7.10 ODORISATION SKID piping material testing and NDT of welds as per PMS.
- 7.11 The ODORISATION SKID hydro testing. Hydro testing shall be carried out at minimum test pressure 1.5 times of design pressure witnessed by a qualified and reputed third party, who will also certify the compliance of the tanks to the design and specifications.
- 7.12 Leak test of complete ODORISATION SKID with air/ N2.
- 7.13 ODORISATION SKID functional testing considering pressure regulation, limiting and safety characteristics.
- 7.14 Any other tests which are not mentioned above, but required to assess the overall performance of the skids.
- 7.15 Vendor shall perform the usual standard tests to maintain quality control procedures. These test certificates shall be submitted, for review, before starting inspection by Purchaser, Supplier shall be responsible for testing and complete integration of the system. Detailed procedures of test and inspection shall be submitted by the supplier for review before order and mutually agreed upon.
- 7.16 Vendor shall include inspection by the Purchaser at vendor's shop. For this inspection manpower, consumable, equipment and utilities as required shall be in vendor's scope.

8.0 FACTORY INSPECTION & PERFORMANCE TEST

The factory inspection and final performance test of complete ODORISATION SKID as per the approved QAP shall be carried out in presence of Third Party (in Bidder's scope) and/or HOGPL representative nominated by HOGPL before giving clearance for dispatch. Vendor to have adequate facilities to carry out the performance test.

9.0 DOCUMENTATION

The Purchaser, in vendor data requirement sheets, shall provide detailed drawings, data sheets and catalogues, required from the vendor. The required number of reproducible and prints should be dispatched to the address mentioned, adhering to the time limits indicated. The vendor's data requirements shall cover the following.

9.1 INSPECTION & TEST REPORTS

Incoming Materials Inspection & Verification reports
Material Identification Records
Welding Procedure Qualification Test and Procedure Qualification Record
Welding Record Sheet
Non-Destructive Test Report
Pressure Test Report Air Leak Test Report Final Dimension Record
Painting Inspection Report



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ODORISATION Programmed Data Report Odorant Tank Calibration Record Factory Inspection Test Report

9.2 CERTIFICATES

- a) Valve Test /Inspection and Mill Certificates
- b) Test / Inspection Certificate for Gauge and Instrument valves
- c) Test /Calibration Report for Pressure Gauges Test /Compliance Certificate for Level Gauges Test /Performance Certificate for Injection Pump.

9.3 SYSTEM DRAWINGS AND SPECIFICATIONS

- a) Piping and Instrumentation Diagram
- b) General Arrangement Drawing Electrical Wiring Schematics Foundation Bolt Holes Drawing Data Sheets
- c) Nameplate Details Bill of Materials Spare Part List

9.4 OPERATING MANUALS / INSTRUCTIONS MANUAL

Installation manual Operation manual Maintenance manual.

1. Final drawings from the vendor shall include dimensional details, foundation details, and weight, mounting details and any other special requirements etc. for the ODORISATION SKID. All dimensions in general shall be in millimeters.
2. Vendor shall furnish all manuals necessary to test, operate and maintain the system.
3. The soft copies (in CD, DVD, etc.)-TWO NO. of above-mentioned documents, shall also be provided to the purchaser at the time of delivery of each skid.

10.0 NAMEPLATE

ODORISATION SKID and all the instruments in the ODORISATION SKID shall have a SS nameplate attached firmly to it at a visible place furnishing the following information:

Manufacturer's Name
Manufacturer's marking
Tag number as per Purchaser's data sheets
Design Flow range Design Pressure Serial Number
Manufacturer's model number
Name of client
Size & Weight of the equipment
Odorizer tank storage capacity
Odorizer tank last & next hydro test date

Note: Please note that non-metallic labels are not allowed.

Caution Markings like "no Smoking", No Flame', "High Pressure Gas Station" etc. shall be affixed to the ODORISATION SKID frame as per relevant practices.

11.0 PAINTING

- 11.1 All exposed carbon steel parts to be painted shall be thoroughly cleaned from inside and outside to remove scale, rust, dirt, and other foreign materials by wire brushing and sand blasting as applicable. Minimum acceptable standard in case of power tool cleaning shall be St. 3 and in case of blast cleaning shall be Sa 2½ as per Swedish Standard SIS 0055900.
- 11.2 Non-ferrous materials, austenitic stainless steels, plastic- or plastic-coated materials, insulated surfaces of equipment and pre-painted items shall not be painted.
- 11.3 Stainless steel surfaces both inside and outside shall be pickled and passivated.
- 11.4 Machined and bearing surfaces shall be protected with varnish or thick coat of grease.
- 11.5 Depending on the environment, following primer and finish coats shall be applied.

i) Normal Industrial

- Surface : Sa 2½ Preparation
- Primer : 2 coats of Red-oxide zinc chromate each 25 microns (min.) thick.
- Finish Coat : 2 coats of synthetic enamel, each 25 microns (min.) thick.

ii) Corrosive Industrial

- Surface : Sa 2½ Preparation
- Primer : 2 coats of Epoxy zinc chromate each 35 microns (min.) thick.
- Finish Coat : 2 coats of Epoxy high build paint each 100 microns (min.) thick.

iii) Coastal and Marine

- Surface : Sa 2½ Preparation
- Primer : 2 coats of high build Chlorinated Rubber zinc phosphate, each 50 microns (min.) thick.
- Finish : 2 coats of chlorinated rubber paint, each 35 microns (min.) thick.

iv) All Environment

- Surface : Sa 2½ (Temp.80-400C) Preparation
- Finish : 2 coats of heat-resistant aluminum paint suitable for specified temp. each 20 µ thick. (All values refer to dry film thickness).

The valves in carbon steel body shall be painted light gray (RAL 7035). ODORISATION SKID piping shall be canary yellow.



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The caution markings on front and back panel in Canary Yellow color. (Markings shall be submitted to HOGPL for approval).

12.0 SHIPPING & MARKINGS

- 1) All threaded and flanged opening shall be protected to prevent entry of any foreign materials.
- 2) All field-mounted instruments shall be supplied loose to avoid damages during transportation.
- 3) ODORISATION SKID shall bear proper shipping markings.
- 4) REJECTION

Vendor shall make his offer in detail, with respect to every item of the Purchaser's specification. Any offer not conforming to this shall be summarily rejected.

13.0 INFORMATION TO BE SUPPLIED WITH TENDER

Installation arrangement for guidance is as shown in schematic drawing enclosed. Actual arrangement along with P&ID along with the sizing calculations shall be proposed by vendor in the offer, as per relevant codes and practices for supply of natural gas.

Technical literature, dimensional details of equipment (ODORISATION SKID) shall be provided along with quotation.

Vendor to specify the facilities available at their works for carrying out the performance test of the complete ODORISATION SKID.

Type, model number & manufacturer of all components of ODORISATION SKID shall be mentioned clearly in the offer. Specific technical catalogues (in English language only) of the models offered shall be furnished with the technical bid.

The vendor shall provide details of similar installation, which have been designed, fabricated & are in successful operation.

14.0 QUALITY SYSTEM:

The vendor shall demonstrate at the time of tendering for these works (by presenting authentic copies of documentation) that they have in place a current accredited ISO 9000 series quality system for their design, supply, and installation and commissioning capacity.

- a) Unsatisfactory quality may be taken as a basis for rejection of a lot or shipment.
- b) The standard ISO 9000 series provide recommended quality systems.

15.0 NATURAL GAS COMPOSITION

S.N.	Components	Mol%
------	------------	------

1)	C1	86.6493.0
2)	C2	4.0 – 6.0
3)	C3	0.8 – 1.93
4)	i-C4	0.123
5)	n-C4	0.172
6)	i-C5	0.0118
7)	n-C5	0.034
8)	C6+	-
9)	H2	-
10)	N2	0.2278
11)	O2	-
12)	CO2	2.75
13)	H2S	-
14)	Gas quality	Dry gas
15)	Specific gravity	0.6211
16)	Calorific value	8385 Kcal/Nm3

16.0 MAINTENANCE SCOPE OF WORK

The Scope of work related to maintenance of the odorizing SKID shall include following:

16.1 Compulsory Quarterly maintenance

- 1) Leakage Testing: - Checking up of each tubing connections for any leakages using soap solution. In case any leakage is found, the same to be replaced with spares provided by the vendor.
- 2) Tubing's should be opened, cleaned and reaffixed - Leak test using soap solution will be done and incase of any leak the joints will be disassembled and rectified. In general tubes should not be opened and closed unless if there is a leak.
- 3) Checking of all the cable for its joints and any cuts in the cabling exposed to atmosphere. If the joints are loose or there is cut in the cable, then replacing the portion of the cable. (Cable and cable glands to be supplied by the vendor).
- 4) Cleaning of display parts of Pressure Gauge, Level Gauge, PSV etc.
- 5) Replacement of any spare, if required.
- 6) Checking for corrosion and touch-up painting wherever required. A complete painting of the system shall be done every 12 months.



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- 7) Neutralizer, adsorbent and masking agent (if required) shall made available by vendor at each odorizing SKID and will be replaced in every 3 months.
- 8) Checking up the electronic panel, components and cables for its proper functioning. In case of malfunctioning of the same, it should be repaired. Spares required, if any, shall be provided by the vendor.
- 9) Checking up of Controller parameters like odorant injection, pump strokes, pump displacement, Vero-meter level, battery voltage, flow signal %, date & temperature or any other parameter. In case of any of these not working properly, it should be checked and problem should be rectified.
- 10) The mechanical components like solenoid valves, relays, filters etc. should be checked and if having any problem, they should be changed.
- 11) The execution of aforesaid scope of work till completion shall be entirely vendor's responsibility and regardless of the number of days spent on site, the execution of the scheduled work in total shall be treated as ONE VISIT ONLY.
- 12) Any other work not mentioned herein, however required for proper repair and maintenance and smooth functioning of ODORISATION SKID, shall be done by vendor to the satisfaction of HOGPL.
- 13) Remote Monitoring System: Any spare part or software related to remote monitoring system shall be replaced or modified as and when required.
- 14) Periodic Calibration of Pressure Relief Valve and Pressure Gauge will be done.
- 15) Thickness measurement test of all storage tank will be done once in a year and submit report.
- 16) Disposal of any hazardous waste shall be the sole responsibility of vendor.
- 17) Supervision and support during odorant refilling activity. Whereas procurement of odorant shall be in the scope of owner.
- 18) Online monitoring shall be made available to HOGPL.
- 19) Machine shall be operational on round the clock basis. Vendor has to reach the site within 08 hours in case of emergency. No machine shall be idle/non-functional/under breakdown continuously for more than 24 hours. In case of machine being non-operational for time exceeding 24 hours, then penalty @ Rs. 1000/- per hour shall be imposed.

20) 24-hour online monitoring shall always be made available to HOGPL through web server/web link/sentry. In case of online monitoring not being operational or showing erroneous data continuously for more than one day then penalty @ Rs. 500/- per day shall be levied.

16.2 On-call basis/Emergency visit:

This shall include any repair service provided on call of breakdown from HOGPL other than the contractual scheduled maintenance. The spares are to be provided by the vendor without any extra cost implication to HOGPL.

17.0 DATASHEET – 1000 WL ODORIZATION SKID WORK

S.N.	Parameter	Value
1.	Flow rate	01 MMSCMD Max.
2.	Operating pressure @ dosing	19-26 bar(g) Normal; 49 bar(g) Max.
3.	Design pressure @ dosing	49 bar (g)
4.	Design Temperatures	0 – 60 °C
5.	Operating Temperatures	0 – 60 °C
6.	Ingress Protection	IP-65
7.	Gas Odorant	75-80% TBM (Tert-Butyl Mercaptan) + 20-25% MES (Methyl Ethyl Sulphide) Also compatible with Ethyl Mercaptan / TBM + THT blends/ THT / TBM + TBM Blends.
8.	Flow rate of Odorant	#
9.	Power Supply	Single phase, 230V, 50Hz / 24V DC
10.	Power consumption	#
11.	Storage container (with level gauge)	1000 liter (01 no. of 1000 ltr. (SS 304 tanks are Shell End Plus dish End both have 8 mm minimum thickness) - Electronic level transmitter - Electronic temperature
12.	Storage tank containment	Separate containment of 100% capacity of each of the odorant storage tank, as per T4S observations.
13.	Filtration/scrubber	# (Double/redundant filtration/scrubber system)
14.	Pneumatic/Electrical Pump (Duty + standby)	#
15.	Electronic Control SKID (ECU)	#
16.	Data Reading & writing	#
17.	Gas Flow input Signal	Analog, 4-20mA
18.	Line size	#
19.	Design pipeline rating	ANSI 300#
20.	End connection	#
21.	Tubing Size	#



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22.	Gas inlet tapping	#
23.	Injector Probe Tapping	# (1 main + 1 standby)
24.	Pump	# (1 main + 1 standby) with Electric/ pneumatic motor
25.	Pressure transducer	4-20 mA at Pump discharge & PCV downstream

Vendor shall specify and fill in required information, as per tender requirements Separate OEM Datasheets required for bought-out components.



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LIST OF RECOMMENDED THIRD-PARTY INSPECTION AGENCY (TPIA)



LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

**TOTAL
SHEETS**

61

DOCUMENT NO

VCS-00-00-VL-0001

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

14

30.06.2025

Issued as Standard

Ramveer Singh

Safdar Ali

Rachna Shukla

REV

DATE

DESCRIPTION

PREP

CHK

APPR

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**A. MECHANICAL & PIPELINE****1.0 CARBON STEEL PIPES****1.1 PIPE CARBON STEEL TO INDIAN STANDARDS**

- a. A.S.T. Pipes Pvt. Ltd. (AST Group)
- b. Advance Steel Tube Ltd.
- c. Apl Apollo Tubes Ltd. (Er. Bihar Tubes Ltd.
- d. Asian Mills Pvt. Ltd.
- e. Asrani Tubes Limited
- f. Dadu Pipes (P) Ltd.
- g. Essar Steel Limited(Er Hazira Pipes Mill)
- h. Gaurang Products Pvt Ltd. (Ast Group)
- i. Goodluck Steel Tubes Ltd.
- j. Hi-Tech Pipes Limited
- k. Indus Tube Limited
- l. Jindal Industries Ltd
- m. Jindal Pipes Ltd.
- n. Jindal Saw Ltd (Kosi Works)
- o. Jotindra Steel & Tube Ltd
- p. Lalit Pipes And Pipes Ltd.
- q. Maharashtra Seamless Ltd.
- r. Man Industries (India) Ltd. – Pithampur
- s. Man Industries (India) Ltd. Anjar
- t. Mukat Tanks & Vessels Ltd.
- u. Nezone Tubes Limited
- v. North Eastern Tubes Limited
- w. Pratibha Industries Limited
- x. Pratibha Pipes & Structural Ltd.
- y. Psl Ltd (Chennai)
- z. Psl Ltd (V1, V2 & NC)
- aa. Rama Steel Tubes Ltd.
- bb. Ratnamani Metals And Tubes Ltd.
- cc. Ravindra Tubes Limited



- dd. Samshi Pipe Industries Limited
- ee. Surya Roshni Ltd.
- ff. Swastik Pipes Ltd.
- gg. Utkarsh Tubes & Pipes Ltd. (Formly Bmw)
- hh. Welspun Corp. Limited (Dahej)
- ii. Zenith Birla (India) Limited

1.2 PIPE & TUBULARS TO A.P.I. STANDARDS

- a. Arcelormittal Tubular Products Roman Sa, Romania
- b. Bhel (Trichy), India
- c. Dalmine Spa (Enquiry To Tenaris), Uae
- d. Eewkorea Co. Ltd (Germany), Korea
- e. Eew Korea Co. Ltd. (Korea), Korea
- f. Eisenbau Kramer Gmbh, Germany
- g. Hyundai Rb Co. Ltd. South Korea
- h. Ilva Lamiere E Tubi Srl (Enq To Ilva Spa, Italy)
- i. Inox Tech. Spa, Italy
- j. ISMT Ltd. Ahmedngr, India
- k. TATA Steel, India
- l. PSL
- m. Jindal Pipes Ltd., India
- n. Jindal Saw Ltd. (Kosi Works), India
- o. Jindal Saw Ltd. (Nashik Works), India
- p. Lalit Pipes And Pipes Ltd. India
- q. Maharashtra Seamless Ltd., India
- r. Man Industries (I) Ltd. (Pithampur), India
- s. Mukat Tanks & Vessels Ltd., India
- t. Pratibha Industries Limited, India
- u. Ratnamani Metals And Tubes Ltd., India
- v. Siderca S.A.I.C (Enquiry Totenaris), Uae
- w. Sumitomo Metal Ind. Ltd., India
- x. Surya Roshni Ltd., India
- y. Swastik Pipes Ltd, India
- z. Tata Steel Uk Limited (Formerly C702)
- aa. Tubos De Acero De Mexico Sa (Enq. Tenaris), Uae



- bb. Tubos Reunidos Sa Spain
- cc. Umran Steel Pipe Inc (Turkey), Turkey
- dd. Valcovny Trub Chomutov, Czech Republic
- ee. Vallourec And Mannesmann Tubes, France
- ff. Welspun Corp Limited (Dahej), India

1.3 PIPE/TUBE CS (SEAMLESS) TO ASTM STANDARDS

- a. Arcelormittal Tubular Products Roman Sa, Romania
- b. Bhel (Trichy), India
- c. Changshu Seamless Steel Tube Co. Ltd., China
- d. Dalmine Spa (Enquiry To Tenaris, Uae
- e. Heavy Metals & Tubes Limited (Mehsana), India
- f. Ismt Ltd. Ahmednagr, India
- g. Ismt Ltd. Baramati India
- h. Jfe Steel Corporation, Uae
- i. Jindal Sdaw Ltd (Nashik Works) India
- j. Klt Automotive And Tubular Products Ltd., India
- k. Mahalaxmi Seamless Limited, India
- l. Maharashtra Seamless Ltd, India
- m. Products Tubulares S.A.U, Spain
- n. Ratnadeep Metal Tubes Ltd., India
- o. Staineest Tubes Pvt Ltd., India
- p. Sumitomo Metal Ind. Ltd., India
- q. Tubos Reunidos Sa Spain
- r. Valcovny Trub Chomutov, Czech Republic
- s. Vallourec Andmannesmann Tubes France
- t. Yangzhou Chengde Steel Pipe Co. Ltd Dubai (UAE)
- u. Jindal SAW Ltd Kosi Kalan Mathura

1.4 PIPE CARBON STEEL (WELDED) TO ASTM STANDARDS

- a. Eew Korea Co. Ltd. (Germany), Korea
- b. Eew Korea Co. Ltd. (Korea), Korea
- c. Eisenbau Kramer Gmbh, Germany
- d. Hyundai Rb Co. Ltd., South Korea
- e. Inox Tech. Spa, Italy
- f. Jindal Saw Ltd (Kosi Works), India



- g. Lalit Pipes and Pipes Ltd., India
- h. Man Industries (I) Ltd.(Pithampur), India
- i. Man Industries (India) Ltd. Anjar, India
- j. Mukat Tanks & Vessels Ltd., India
- k. Ratnamani Metals And Tubes Ltd., India
- l. Sumitomo Metal India Ltd., India
- m. Tata Steel Uk Limited

2.0 VALVES

2.1 GLOBE VALVES

- a. BDK (New Delhi)
- b. Datre Corpn (Calcutta)
- c. KSB Pumps (New Delhi)
- d. L&T (New Delhi)
- e. Neco Schuber & Salzer Ltd. (New Delhi)
- f. Niton Valve (Mumbai)
- g. Ornate Valves (Mumbai)
- h. Panchavati Valves (Mumbai)
- i. AV Valves Ltd.
- j. BHEL (Trichy), India
- k. Econo Valves Pvt Ltd, India
- l. Fouress Engg (I) Ltd (Aurangabad)
- m. Guru Industrial Valves Pvt Ltd
- n. Leader Valves Ltd, India
- o. NSSL Ltd. (Neco Schubert & Salzerltd)
- p. Oswal Industries Ltd, India
- q. Petrochemical Engineering Enterprises, India
- r. Sakhi Engineers Pvt Ltd
- s. Shalimar Valves Pvt Ltd
- t. Steel Strong Valves India Pvt Ltd, India
- u. Petro Valves Pvt. Limited, Ahmedabad
- v. Hawa Engineers Limited, Ahmedabad (Non API)
- w. G M Engineering PVT LTD (Non API)

**2.2 CHECK VALVES**

- a. Advance Valves Pvt. Ltd., Noida
- b. Aksons & Mechanical Enterprises, Mumbai
- c. Larsen & Toubro Limited (Audco India Limited, Chennai)
- d. AV valves Ltd., Agra
- e. BDK engineering India Ltd., Hubli
- f. BHEL, OFE&OE Group, New Delhi
- g. Datre Coroportion Limited, Calcutta
- h. Leader Valves Ltd., Jalandhar
- i. Neco schubert & Salzer Ltd., New Delhi
- j. Niton Valves Industries (P) Ltd., Mumbai
- k. Precision Engg. Co., Mumbai
- l. Econo Valves Pvt Ltd, India
- m. Fouress Engg (I) Ltd (Aurangabad)
- n. KSB Pumps Ltd (Coimbatore), India
- o. NSSL Ltd. (Neco Schubert & Salzer Ltd)
- p. Oswal Industries Ltd, India
- q. Panchvati Valves & Flanges Pvt Ltd, India
- r. Petrochemical Engineering Enterprises, India
- s. Sakhi Engineers Pvt Ltd
- t. Shalimar Valves Pvt Ltd
- u. Steel Strong Valves India Pvt Ltd, India
- v. Shiv Shakti Engineering Works (Approved up to 06 inch)
- x. Hawa Engineers Limited, Ahmedabad
- y. G M Engineering PVT LTD (Non API)

2.3 PLUG VALVES

- a. Breda Energia Sesto Industria Spa, Italy
- b. Fisher Sanmar Ltd., Chennai
- c. Larsen & Toubro Ltd., New Delhi
- d. Nordstrom Valves, USA
- e. Serck Audco Valves, UK
- f. Sumitomo Corporation India Pvt. Ltd., New Delhi
- g. Z Corporation, Korea
- h. Hawa Valves (India) Pvt. Ltd., Mumbai



- i. Steel Strong Valves India Pvt. Ltd., Navi Mumbai
- j. Econo Valves
- k. Flow-Serve PTE (Mfr. SERCK), India

2.4 BALL VALVES

- a. Hawa Valves (India) Pvt. Ltd, Navi Mumbai
- b. Larsen & Toubro, Delhi
- c. Microfinish Valves Pvt. Ltd., Noida
- d. Oswal Industries Ltd., Gandhi nagar
- e. Virgo Engineers Ltd., Delhi
- f. Boteli Valve Group Co. Ltd., China
- g. Cameron (Malaysia) SDN BHD, Malaysia
- h. Dafram S.P.A., Italy
- i. Fangyuan Valve Group Co. Ltd., China
- j. Franz Schuck GmbH, Germany
- k. O.M.S. Saleri (Italy)
- l. Pibi Viesse S.P.A (Italy)
- m. Nuovo Pignone (Italy)
- n. Perar S.P.A (Italy)
- o. Pietro Fiorentini (Italy)
- p. Cooper Cameron Valv Italy SRL-FRM, Italy
- q. Petrol Valves SRL
- r. Tormene Gas Technology S.P.A (VALVITALIA)
- s. Petro Valves Pvt. Limited, Ahmedabad
- t. Shiv Shakti Engineering Works (Approved up to 08 inch)
- u. Hawa Engineers Limited, Ahmedabad
- v. G M Engineering PVT LTD.

3.0 TEE

3.1 FLOW TEE

- a. Coprosider SPA, Italy
- b. GEA Energy System India Limited, Chennai
- c. Multitex Filtration
- d. Pipeline Engineering, UK
- e. Scomark Engg. Limited (U.K.)
- f. Skeltonhall Limited, England(U.K.)



- g. Technospecial SPA, Italy
- h. Tectubi SPA, Italy
- i. RMA Germany
- j. Pipefit Engineers Pvt. Ltd.
- k. Vee Kay Vikram & Co.

3.2 SPLIT TEE

- a. IPSCO, Canda
- b. TD Willamsons, USA
- c. Plant-Tech Power Technical Services Pvt Ltd
- d. Teemans, UK
- e. Vee Kay Vikram & CO.

4.0 FLANGES

- a. Aditya Forge Ltd., Vadodara
- b. Amforge Industries Ltd., Mumbai
- c. CD Engineering Co., Ghaziabad
- d. Echjay Forgings Pvt. Ltd. (Bombay), Mumbai
- e. Echjay Industries Ltd., Rajkot
- f. Forge & Forge Pvt. Ltd., Rajkot
- g. Golden Iron & Steel Works, New Delhi
- h. JK Forgings, New Delhi
- i. Metal Forgings Pvt. Ltd., Mumbai
- j. Perfect Marketings Pvt. Ltd., New Delhi
- k. Sky Forge, Faridabad
- l. S&G, Faridabad
- m. Chaudhry Hammer Works Ltd, India
- n. JAV Forgings (P) Ltd, India
- o. Kunj Forgings Pvt Ltd, India
- p. MS Fittings
- q. R.N. Gupta & Co. Ltd, India
- r. R.P. Engineering Pvt Ltd, India
- s. Sanghvi Forgings & Engineering Ltd
- t. Shri Ganesh Forgings Ltd., India
- u. Uma Shankar Khandelwal & Co., India
- v. Sawan Engineers, Baroda



- w. Stewarts & Lloyds of India Ltd., Kolkata
- x. Engineering Services Enterprises
- y. Pipefit Engineers Pvt. Ltd.
- z. Jindal Forging
- aa. Vivial Forges
- bb. N J Engineers (Up to 12 Inch Class 600 Only)

5.0 FITTINGS

- a. Commercial Supplying Agency, Mumbai
- b. Dee Development Engineers Ltd.
- c. Eby Industries, Mumbai
- d. Flash Forge Pvt. Ltd., Vishakhapatnam
- e. Gujarat Infra Pipes Pvt. Ltd., Vadodara
- f. M.S. Fittings Mfg. Co. Pvt. Ltd., Kolkata
- g. Stewarts & Lloyds of India Ltd., Kolkata
- h. Teekay Tubes Pvt. Ltd., Mumbai
- i. Pipe Fit, Baroda
- j. Sky Forge, Faridabad
- k. S&G, Faridabad
- l. Sawan Engineers, Baroda
- m. Eby Fasteners, India
- n. Leader Valves Ltd, India
- o. R.N. Gupta & Co. Ltd, India
- p. Exten Engg Pvt Ltd
- q. Sivananda Pipe & Fittings Ltd
- r. Jindal Forging
- s. Vivial Forges
- t. PK Tubes Rajasthan
- u. CSA Fitting
- v. Gujarat Infrapipes pvt ltd, Vadodara
- w. KS Pipes Fitting Pvt Ltd, Palwal
- x. Tube Bend, Kolkata

6.0 PIG LAUNCHERS/ RECEIVERS/ PIG SIGNALERS

- a. Bassi Luigi Fittings B.V., Holland



- b. BRAUN STAHL PIPE TEC, GERMANY
- c. FORAIN, ITALY
- d. Fluidel SRL, ITALY
- e. RMA Maschinen- und, GERMANY
- f. Siirtec Nigi, Italy
- g. SCHUCK ARMATUREN, GERMANY
- h. T.D. Williamson Inc., USA
- i. Tectubi SPA, Italy
- j. Taylor Forge Engineering System INC, USA
- k. Tormene Americana S.A. (Argentina)
- l. Tormene Gas Technology S.p.A., Italy
- m. PIPELINE ENGINEERING, UNITED KINGDOM
- n. Krohne, Oil & Gas BV, Drive Houston,
- o. Multitex Filtration Engrs. Ltd, New Delhi
- p. BGR ENERGY SYSTEMS LIMITED New Delhi
- q. Glapwell Contracting Services Ltd. UK
- r. FULGOSI GIOVANNI S.n.c di Corrado & C, ITALY
- s. VEEKAY VIKRAM & CO, GUJRAT
- t. GBM S.R.L, ITALY
- u. Cardew Ltd., Alexeander
- v. Forain S.R.L.
- w. GD Engineering, India
- x. Pipeline Engineering, UK
- y. Siirtec Nigi SPA
- z. Control Plus
- aa. Oswal Infrastructure

7.0 LONG RADIUS BENDS

- a. Jindal Saw Ltd. (Kosi Works), India
- b. PSL Limited (Gandhidham – Mfrg), India
- c. BHEL, Trichy, Tamilnadu
- d. Welspun, Gujarat
- e. Sawan
- f. Gujarat Infra
- g. P K Tubes



- h. DEE Development
- i. Pipefit Engineers Pvt. Ltd.

8.0 CLEAN AGENT SYSTEM

- a. ADN Fire Safety Pvt Ltd (Vashi East, Thane)
- b. Chetan Corporation (Ahmedabad)
- c. Chetan Engineers (Ahmedabad)
- d. Mx Systems International Pvt. Ltd. (Mumbai)
- e. New Fire Engineers (P) Ltd (Sil Vassa)
- f. Nitin Fire Protection Industries Ltd (New Bombay)
- g. Nohmi Bosai (India) Private Limited
- h. Tyco Fire & Security India Pvt. Ltd (Bangalore)
- i. Vimal Fire Controls Pvt Ltd (Vadodara)

9.0 INSULATING JOINTS

- a. IGP Engineers
- b. V K Vikram
- c. Advance Electronics
- d. Nupros INC

10.0 GASKETS

- a. IGP Engineers (P) Ltd., Madras
- b. Madras Industrial Products, Madras
- c. Dikson & Company, Bombay
- d. Banco Products (P) Ltd., Vadodara
- e. Goodrich Gaskets Pvt Ltd
- f. Starflex Sealing India Pvt Ltd, India
- g. Teekay Meta Flex Pvt Ltd
- h. UNIKLINGER Ltd
- i. HEM Engg. Corp.
- j. Unique Industrial Packing Pvt. Ltd.

11.0 FASTENERS

- a. Nireka Engg. Co. (P) Ltd., Calcutta
- b. Precision Taps & Dies, Bombay
- c. AEP Company, Vithal Udyoug Nagar
- d. Fix Fit Fasteners, Calcutta



- e. Precision Engg. Industries, Baroda
- f. Echjay Forgings Pvt. Ltd., Bombay
- g. Capital Industries, Bombay
- h. Boltmaster India Pvt Ltd, India
- i. Deepak Fasteners Limited, India
- j. Fasteners & Allied Products Pvt Ltd, India
- k. Hardwin Fasteners Pvt Ltd, India
- l. J.J. Industries, India
- m. Multi Fasteners Pvt Ltd, India
- n. Nexo Industries, India
- o. Pacific Forging & Fasteners Pvt Ltd, India
- p. Pioneer Nuts & Bolts Pvt Ltd, India
- q. Precision Auto Engineers, India
- r. President Engineering Works, India
- s. Sandeep Engineering Works, India
- t. Syndicate Engineering Industries, India

12.0 WELDING ELECTRODES FOR PIPELINE/PIPING WORK

- a. For Mainline – Lincoln/ Bohler make
- b. For Terminal – For root pass –Lincoln/ Bohler make
For other passes – Lincoln, D&H or equivalent makeLincon

13.0 STRAINERS

- a. Bombay Chemical Equipments
- b. Gujarat Auto filed
- c. Multitex Filtration Engineering Limited
- d. Grand Prix Engineering Limited

14.0 COLD APPLIED TAPES

- a. Denso GmbH
- b. Raychem

15.0 HEAT SHRINKABLE SLEEVE/ FIBREGLAS REINFORCED SLEEVE

- a. Covalence - Seal For Life India Pvt. Ltd. (Formerly Covalence Raychem- Berry Plastics Corporation)
- b. Canussa-CPS
- c. Rigil Techno India(Distributor for M/s CYG Changtong New Material Co Ltd,China)



- d. M/s Shri Narayan Impac-India LLP

16.0 STUD BOLTS WITH NUTS

- a. Multi Thread Fasteners, Baroda
- b. Darukhanwala
- c. Precision Engineers, Baroda
- d. Unbrako
- e. TVC

17.0 WARNING MAT

- a. Sparco Multiplast Pvt. Ltd., Ahmedabad
- b. Singhal Industries , Ahemdabad
- c. Puja Packing, Mumbai
- d. Bina Enterprises, Mumbai
- e. Shree Vijay Wire & Cable Industries

18.0 HDPE PIPES/DUCT

- a. Climax Synthetics (P) Ltd., Vadodra
- b. Indian Poly Pipes, Calcutta
- c. Jain Irrigation Systems Ltd., Jalgaon
- d. Kirti Industries (India) Ltd., Indore
- e. Ori Plast Limited, Calcutta
- f. Phoel Industries Limited, Delhi
- g. Sangir Plastics (P) Ltd., Mumbai
- h. Veekay Plast,Jaipur
- i. Kisan Irrigation
- j. Dutron Polymers Ltd.
- k. Manikya Plastichem (P) Ltd
- l. Himalyan Pipe Industries
- m. NorthEast Polypipes LLP
- n. Mukand Poly Products (for Duct)

19.0 DRY GAS FILTER & FILTER SEPERATOR

- a. Grand Prix Fab (Pvt.) Ltd. (New Delhi)
- b. Perry Equipment, USA
- c. Faudi Filter, Germany



- d. Forain S.r.l., Italy
- e. ABB, Faridabad
- f. Burgess Manning, USA
- g. Multitex Filtration Engineers India
- h. Triveni Plenty Engg. Ltd. (New Delhi)
- i. Siirtec International Contractor S.P.A (Italy)
- j. Flashpoint, Pune india
- k. Filtration Engineers (I) Pvt Ltd, India
- l. Gujarat Otofilt, India
- m. Tormene Gas Technology
- n. Ultrafilter (India) Pvt Ltd, India
- o. Ravi Techno Systems Pvt Ltd, India
- p. Siirtec Nigi S.P.A
- q. Filtan Filter Anlagenbau GmbH
- r. Fairley Arlon BV
- s. PECO Facet
- t. EPE Epenstenner GMBH
- u. Filtrex srl
- v. Petromar Engineered Soln
- w. Plenty Filter
- x. Eurofiltrec
- y. PTI Technologies Inc
- z. R S Instrumentation and Services

20.0 FILTER ELEMENT

- a. Peco – Facet
- b. Velcon
- c. Pall – Filterite
- d. Burgess Manning

21.0 NDT AGENCY

- a. NDT Services, Ahmedabad
- b. GEECY Industrial Services Pvt. Ltd., Mumbai
- c. Corrosion Control Services, Mumbai
- d. Perfect Metal Testing & Inspection Agency, Calcutta
- e. Inter Ocean Shipping Co., New Delhi



- f. RTD, Mumbai
- g. Sievert, Mumbai
- h. X-Tech, Vizag
- i. Industrial X Ray and Allied Radiographers (I) Pvt. Ltd.
- j. Inspection Technology
- k. IXAR
- l. Aditya NDT Services
- m. Riya NDT Engineers
- n. Star NDT Engineers
- o. Technical testing & Inspection Services
- p. PD Engineering Inspection Services

22.0 Cold Applied Tapes

- a. Denso GmbH
- b. Polyken (Berry Plastics Corporation)

22.1 End Seal Tape-PVC

- a. MAASH Industries

23.0 PUR Coating

- a. Powercrete (Berry Plastics Corporation)

24.0 Casing End Closure

- a. Raci, Italy
- b. Raychem RPG Limited

25.0 Casing Insulators

- a. Raci, Italy
- b. Raychem RPG Limited
- c. VeekayVikram

26.0 FIRE FIGHTING EQUIPMENT**26.1 FIRE EXTINGUISHERS**

- a. Avon Services (Production & Agencies) Pvt. Ltd., Bombay
- b. Kooverji Devshi & Co., Bombay



- c. Reliable (Fire Protection) India Ltd., Bombay
- d. Zenith Fire Services, Bombay
- e. Safex Fire Services, Bombay
- f. Brij Basi Hi
- g. tech Udyog
- h. Bharat Engg Works, India
- i. Gunnebo India Ltd
- j. Nitin Fire Protection Industries Ltd, India
- k. Supremex Equipments, India
- l. Vimal Fire Controls Pvt Ltd., India

26.2 FIRE HYDRANTS, MONITORS, DELUGE VALVE, NOZZLES

- a. Zenith
- b. Minimax
- c. Newage
- d. HD Fire
- e. Vijay Fire
- f. Asco Strumech Pvt Ltd, India
- g. Brij Basi Hi
- h. tech Udyog
- i. Gunnebo India Ltd
- j. Nitin Fire Protection Pvt Ltd
- k. Shah Bhogilal Jethamal & Brothers
- l. Venus Pumps & Engineering Works

26.3 RRL Hose

- a. Jayshree
- b. Newage

26.4 HOSES

- a. Ashit Sales Corporation, Bombay
- b. Royal India Corporation, Bombay
- c. Gayatri Industrial Corporation
- d. Simplex Rubber Products Ltd., Ahmedabad
- e. Zaverchand Marketing Pvt. Ltd., Baroda
- f. Presidency Rubber Mill, Calcutta
- g. The Cosmopolite, Calcutta



- h. Simplex Rubber Products, Thane

NOTE:

- 1) For procuring bought out items from vendors other than those listed above, the same may be acceptable subject to the following: -
 - a) The vendor/ supplier of bought out item(s) is a manufacturer/ supplier of said item(s) for intended services and the sizes being offered is in their regular manufacturing supply range.
 - b) The vendor / supplier should not be in the Holiday list of CLIENT / VCS / other PSU.
 - c) Should have supplied at least one single random length (i.e. 5.5 meters to 6.5 meters) for item assorted pipes / tubes and for other items, which are to be supplied in quantity on number-basis (other than assorted pipes / tubes) minimum 01 (One) number of same or higher in terms of size and rating as required for intended services. The bidder should enclose documentary evidences i.e. PO copies, Inspection Certificate etc. for the above, along with their bids.
- 2) For any other item(s) for which the vendor list is not provided, bidders can supply those item(s) from vendors/ suppliers who have earlier supplied same item(s) for the intended services in earlier projects and the item(s) offered is in their regular manufacturing/ supply range. The bidder is not required to enclose documentary evidences (PO copies, Inspection Certificate etc.) along with their offer, however in case of successful bidder, these documents shall require to be submitted by them within 30 days from date of Placement of Order for approval to CLIENT / VCS.
- 3) The details of vendors indicated in this list are based on the information available with VCS, Contractor shall verify capabilities of each vendor for producing the required quantity with. PMC does not guarantee any responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and quality control of each parties and also to expedite the material in time.

B. CIVIL AND STRUCTURAL

Sr. No.	Items/ Name of Products	Make/ Brands/ Manufactures
1.	Reinforcement Steel	TATA, SAIL, RINL, JSW.
2.	Cement	Ambuja, ACC, JK, Grasim, Ultratech, Birla, L&T, Cement Corporation of India
3.	Structural Steel	TATA, SAIL, RINL, IISCO, ESSAR
4.	Structural Steel Tubes ISI Marked	TATA, JINDAL, SURYA
5.	Mineral wool for thermal insulation of ceilings (Under deck insulation)	Rock wool (india) Ltd. Minwool Rock Fibres Ltd., Lloyd Insulation.
6.	Synthetic Enamel Paint (1st quality only)	ICI Paint (Dulux), Asian Paint (Apolite), Berger Paints (Luxol). Goodlass Nerolac Paints (Nerolac), Jenson & Nicholson Paints Ltd (Borolac)



ENERGISING QUALITY

LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

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7.	G.I SHEET	ESSAR, JSW, SAIL
8.	Sheeting Screw	Corroshield, Buildex,
9.	Chemical for Antitermite treatment	DE- NOCIL Bombay, Pest Control of India, Trishul
10.	Factory made Panelled Door shutter	Century; Godrej ; M/s Hindustan Housing factory Ltd., New Delhi ; M/s Delhi Construction Eqp, Sadar Bazar, Delhi ; M/s Joinery manufacturing Co., Calcutta;
11.	PVC Panel Door (Solid Core)	Rajshri Plastiwood Limited, Sintex, Hindopan, Marino
12.	Pressed steel door frames/ cupboard and window frames (manufacturers)	M/s SAIL, M/s TATA
13.	Pressed steel door frames/ cupboard and window frames (fabricators)	M/s Loyal safe works Mayapuri, N/Delhi M/s Multiwyn Industrial Corpn Calcutta M/s Metal Window Corpn N/Delhi M/s Chhabra Steel Udyog, 260 Sadar Bazar, Meerut Cantt. M/s Delite safe works, Rani Jhansi Road, N/Delhi
14.	Steel Windows, Ventilators (as per IS- 1038 of 1983) & frames pressed steel door/window	M/S Multiwyn Industrial Corpn, Calcutta ; M/S Metal Window Corp, N/ Delhi ; M/S Chhabra Steel Udyog 260, Sadar Bazar, Meerut Cantt ; Agent steel MFG Pvt Ltd, Ahmedabad ; Godrej ;
15.	AI Section for AI Door/ Window/ Partitions	Hindalco, Ajit India, Jindal
16.	AluminumI Door/ Window/ Glazing Fabricated and Anodized	M/s Alumilite Pvt Ltd, M/s Ajit India Pvt Ltd, M/s Ramniklal S Raste Agra, Argent Industries, M/s Aluminium Tech Industries, I-2249 DSIDC Narela, Delhi, M/s VR Associates, GH-14/242 Paschim Vihar, Delhi
17.	Aluminium door and windows Fittings	M/s Elite Enterprises C/6 Shalimar Hardware 133, Jarg Mahal, Dhobitalao Mumbai 400002. M/s Mohan Metal Industries 178/2-A, Bhole Nath Nagar, Shahadara, Delhi 110032. Mepro, Argent New Delhi, Classic, New Delhi. Jindal, Argent New Delhi, Golden Industries Pvt. Ltd. ECIE
18.	Aluminium Grill	Alu Grill, Arihant Aluminium Corporation, Decogrille
19.	Door Closer	Everite, Golden, Gandhi,
20.	Floor Spring	Prabhat, Everite
21.	Plywood for general purpose (IS-303)	National Plywood Inds Pvt Ltd, S Fancy lane, 8th floor, Calcutta-700001, Merino Plywood, Archid Ply, Ply, Swastik, Universal, Century, Greenply, National.
22.	Pre laminated Particle board	Kitply, Bhutan board, Ecoboard, Novapan, Archid ply, Merinova, Merino



LIST OF RECOMMENDED VENDORS FOR BOUGHT OUT ITEMS

23.	Laminated Sheets	Formica, Merino Lam, Greenlam, National, Century
24.	Modular Partitions	Godrej, Blowplast
25.	False Ceiling (Mineral Fibre Board)	Armstrong, Daiken, Luxalon, Llyods, Gypboard, Trac, Aerolite
26.	Aluminium False Ceiling	Lloyds, Armstrong, Luxlon, Trac
27.	Flooring Tiles (Mosaic / Terrazzo / PCC) (1st quality only)	Kajaria Ceramics, NITCO, Royal Tiles, Gem Tiles, Hindustan Tiles, M/S National Tiles & Industries, Ultra Tiles
28.	Glazed Ceramic Tiles, Non-Skid (Floor/Wall), (1st quality only)	Kajaria, Somany, NITCO. Murudeshwar Ceramic Ltd (Navin Diamond tile), Johnson (Marbonite),
29.	Vitrified/ Designer Vitrified Tiles (1st quality only)	Asian, Marbonite (Johnson), Kerrogres (Kajaria), NITCO, Orient
30.	PVC Tiles/Flooring (IS 3461) (1st quality only)	Marblex Tiles, Krishna Tiles, Polyfin, Armstrong, Wonder floor.
31.	False Flooring	Godrej or equivalent
32.	Glass Mosaic Tiles (1st quality only)	Paladio, Coral, Accura, Bisazza, Italia, Mridul.
33.	Designer Paver Tiles/ Interlocking tiles ISI marked/ Grass-jointed Tiles. (1st quality only)	Pavit, Ultra, Hindustan, Eurocon, Vyara, National Tiles, Gem, Unistone, Konkrete, Unitile
34.	Wall care Putty for Base preparation (1st quality only)	Birla Wall care putty, Berger, Jenson & Nicholson, JK White
35.	White Cement (1st quality only)	Birla, JK
36.	Cement based Paints (1st quality only)	Super Snowcem, Duracem, Super Acrocem.
37.	Dry Distemper / Oil bound Distemper (1st quality only)	Goodlass Nerolac Paint, Shalimar Paint, Jenson & Nicholson, Asian Paint, Berger. ICI Dulux
38.	Acrylic Washable Distemper (1st quality only)	Asian, Berger, ICI Dulux, Jenson & Nicholson, Nerolac, Shalimar, Garware & Goodlass
39.	Plastic Emulsion Paint (1st quality only)	Asian, Berger, ICI, Nerolac, Jenson & Nicholson, Shalimar, Garware & Goodlass
40.	Exterior Acrylic Emulsion (1st quality only)	ICI (Weathercoat), Excel (Nerolac), Apex (Asian), Berger, Jenson & Nicholson, Shalimar, Garware & Goodlass
41.	Polymer based Paint	STP, CICO
42.	Textured Paint / Wall Tile (1st quality only)	Unitile, Heritage, Spectrum, Iokos, Acropaints, Asian



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43.	Flexible board for Expansion joint	STP or equivalent
44.	Grout	Shrinkomp, Fosroc, Fairmate
45.	Integral water proofing compound	STP, Pidilite, Fosroc, CICO, Sika.
46.	Concrete Admixture	Pidilite, Fosroc, CICO, Sika.
47.	Water proofing for cementations surface IS-2645	Acrocrete & Acrocote, CICO, Fosroc, STP
48.	Bituminous Product	M/s Faridabad Spinning & Woolen Mills Pvt Ltd, 837, SP Mukherjee Marg Delhi, M/s STP Ltd (Formerly Shalimar Tar Products) M/s Bitufelt Pvt Ltd 123/377 Fazalm Ganj Kanpur 208012, Texas, Texas India Ltd, Multiplas
49.	Hardeners	Ironite, Ferrok, Hardonate
50.	Construction Chemicals	Choksey, CICO, Forsroc, Sika
51.	Stainless Steel Cladding	Jindal
52.	Punch Tape Concertina Coil	Global Technocrat, S.G. Engineers Delhi
53.	Stainless Steel Railing	Jindal
54.	FRP/ HDPE Garbage Bins	Sintex, Swift, Nutech, Sheetal
55.	Sanitary ware	Neycer Kermag (standard), Hindustan Sanitary Ware (Ist quality), Parryware (superfine), Cera (Ist quality), Classica (Ist / standard)
56.	WC seat cover ISI Marked	Parryware, Neycer Kermag (standard), Hindustan Sanitary Ware (Ist quality), Cera (Ist quality), Classica (Ist / standard)
57.	PVC Flushing Cistern IS: 774-1984 (ISI Certified)	Parryware, Hindustan Sanitary Wares, Cera.
58.	Faucets & Taps, Stop Valves & Pillar Taps, Surgical basin mixer, Shower rose etc.	Gem, Parko, Parryware, HSW, Jaquar
59.	Kitchen Stainless Steel Sink	Diamond, Nirali, Neel Kanth, Jayna
60.	Looking Mirror	Saint Gobain, Modi Float, Triveni Float Glass, Crown, Atul.
61.	Readymade Bathroom Cabinets	Commander Gratings (I) Pvt Ltd, Gratolite Cabinet, A- 4 Sector Viii Noida-202701, Alpina, Cera.
62.	Float Valve	Leader, Bombay Metal & Alloy Co, Bombay superflow.
63.	SGSW Pipes (IS-651) ISI Marked	Perfect Agra, Devraj Ind Gaziabad, Buran, RK, Prince,



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64.	CI (Centrifugally Cast) Pipes for sewage disposal ISI marked	NICCO, SRIF, A-1 Singhal Casting Co Agra, Jindal Saw, Kesoram, NECO
65.	PVC rain water/sewage pipes (IS-4985)	Reliance, Finolex, Supreme, Kisan, Prince, Hindustan Plastic & machine corporation, Polypack industries (P) Ltd.
66.	HDPE Water storage tanks (Rotational Moulded)	Sintex, Swift, Nutech, Sheetal
67.	Cast Iron Pipes and Fittings	Hindustan Engineering Products Company Calcutta, S.L.C., Standard approved manufacturers of any other brand of fittings having ISI marking, RIF, BIS
68.	RCC Pipes	Indian Hume Pipe Company, Delhi / Allahabad / Chandigarh / Lucknow; Hindustan Pressure Pipes, Kolhapur; Dhere Concrete Products, Pune or any other approved manufacturer conforming B.I.S. Standard
69.	Brass Fittings	Leader Engineering Works, Jalandhar; L & K Mathura; Luster Sanitary, Jalandhar; Annapurna Metal Works, Calcutta; Neta Metal Works, Jalandhar
70.	C.P. Fittings	Ego Metal Works, Ballabhgarh; Jaquar Industries, Delhi; Soma Plumbing Fixtures Limited, Calcutta; Gem Sanitary Appliances Pvt. Ltd., Delhi; Essco Sanitations, Delhi.
71.	Stone Ware (Salt-Glazed) Pipes	Hind Ceramics Limited, Orissa; Ceramic Industries Limited, Sambalpur; Shrikamakshi Agencies, Madras; Binary Udyog Pvt. Limited, Howrah; Tirumati Moulds Limited, Nagpur.
72.	Asbestos Cement Pipes and Fittings	Ganga Asbestos Limited, U.P.; Hyderabad Asbestos Cement Products Limited; J.K. Super Pipe Industries, Nanded; Konark Cement and Asbestos Limited, Orissa; Maharashtra Asbestos Limited, Bombay.

List of Recommended Vender/Suppliers of Major Bought-Out Items: Unless otherwise specifically mentioned in the Schedule of Items, Contractor has to use materials as listed below, of only these brand names/Company's names, which are mentioned in the RECOMMENDED list for structural items thereon.

Sl. No.	Items/Name of Products	Makes/Brands/Manufactures
1	Structural Steel	SAIL / TATA / RINL / IISCO / ESSAR / ISPAT
2	Structural Steel Tubes ISI Marked	TATA / JINDAL / SURYA / SWASTIK
3	Synthetic Enamel Paint 1st Quality only	ICI Paint (Deluxe), Asian Paint (Apolite), Shalimar Paint (Superlac), Goodlass, Nerolac Paint (Nerolac), Berger Paints

Any materials not fully specified in these specifications and which may be offered for use in the works shall be subject to approval of Engineer, without which it shall not be used anywhere in the construction works.



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**C. ELECTRICAL****LIST OF SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS****1.0 AIR CONDITIONER**

- a. Blue Star
- b. O General.
- c. Daikin.
- d. Carrier
- e. Hitachi.
- f. LG.
- g. Lloyds
- h. Mitsubishi
- i. Panasonic
- j. Sharp
- k. Samsung.
- l. Blue star.
- m. Haier.
- n. Voltas.
- o. Videocon.

2.0 BATTERIES (LEAD ACID)

- a. Amco Batteries Ltd.
- b. Exide Industries Ltd.
- c. HBL Power System Ltd.
- d. Amara Raja Batteries Ltd.
- e. Su-Kam Power Systems Ltd.
- f. Base Corporation Ltd.
- g. Okaya Power Ltd.
- h. Southern Batteries Pvt Ltd.
- i. True Power International Ltd.
- j. Evolute Solutions Pvt Ltd.
- k. Greenvision Technologies Pvt Ltd.
- l. Artheon Electronics Ltd.

**3.0 BATTERIES (NICKEL CADMIUM)**

- a. Amco Saft Batteries Ltd.
- b. HBL Power Systems Ltd.

4.0 BATTERY CHARGER/DC-DC CONVERTER

- a. Amara Raja Power System(P)Ltd.
- b. BCH.
- c. Chhabi Electricals Pvt. Ltd..
- d. Caldyne Automatics Limited.
- e. HBL Nife Power Systems Ltd..
- f. Universal Instrument Mfg. Co Pvt Ltd.
- g. Hitachi HI-REL Power Electronics P. Ltd
- h. Mass-Tech Controls Pvt Ltd
- i. Dubas Engineering Pvt Ltd
- j. Chloride Power Systems & Solutions Ltd
- k. Synergee
- l. Enertech
- m. Vertiv

5.0 CABLE – FIRE ALARM & COMMUNICATION CABLES

- a. Cords Cable Industries Ltd.
- b. CMI.
- c. Delton cables Ltd.
- d. ELKAY Telcelinks.
- e. KEI Industries Ltd.
- f. Elkay Telcelinks

6.0 CABLE – HT(XLPE)

- a. Universal Cable Ltd.
- b. KEI Industries Ltd.
- c. Industrial Cables.
- d. NICCO Corporation Ltd.
- e. Uniflex.



- f. Polycab.
- g. Torrent cables Ltd.

7.0 CABLE – LT / MV POWER AND CONTROL

- a. Cords Cable Industries Ltd.
- b. Universal Cable Ltd.
- c. KEI Industries Ltd.
- d. Havells.
- e. Delton.
- f. Elkay Telelinks.
- g. Evershine Electricals.
- h. Ecko.
- i. Ravin.
- j. Rallison.
- k. Suyog.
- l. Netco.
- m. Uniflex.
- n. Paramount.
- o. Gloster.
- p. Associated cables Pvt Ltd.
- q. CMI.
- r. Gemscab.
- s. Industrial cables.
- t. NICCO.
- u. Polycab.
- v. Torrent.

8.0 CABLE – GLAND

- a. Baliga.
- b. Comet.
- c. Flexpro.
- d. Flameproof.
- e. FCG.
- f. Electro Werke.



- g. Dowels.
- h. CCI.
- i. Sudhir Switchgear
- j. Keyson Techno Equipments,
- k. RAY Flameproof Pvt Ltd

9.0 CABLE – LUGS & TERMINAL BLOCKS

- a. Dowels.
- b. Jainson.
- c. Sharma Electrical
- d. Punitam
- e. Yamuna Powers
- f. Rapid Manufacturer
- g. Varun Controls.

10.0 CABLE – TRAY

- a. Ercon Composites.
- b. Yamuna Power & Infrastructure Ltd.
- c. MEM
- d. Bharti
- e. Profab.
- f. Ratan.
- g. Slotco.

11.0 CABLE TERMINATION AND JOINTING KIT

- a. CCI.
- b. Raychem.
- c. M-Seal.

12.0 CEILING/EXHAUST/PEDESTAL FANS & CIRCULATORS

- a. Bajaj Electricals Ltd.
- b. Crompton Greaves Ltd.
- c. Khaitan Electricals Ltd.
- d. Havell's.



- e. Philips
- f. Usha
- g. Orient

13.0 CONTRACTORS – AC POWER

- a. Andrew Yule.
- b. ABB.
- c. BHEL.
- d. C&S.
- e. Havell's.
- f. L&T.
- g. Schneider.
- h. Siemens Ltd.
- i. Telemecanique.
- j. GE India Industrial

14.0 CONTROL TRANSFORMER

- a. AE.
- b. Indushree.
- c. Intra Vidyut.
- d. Kalpa Electricals.
- e. Transpower Industries Ltd.
- f. Siemens.

15.0 GAS GENERATOR/DIESEL GENERATOR SET

- a. Sterling and Wilson.
- b. Jackson Limited.
- c. Sudhir Gensets.
- d. Power Engineering (India) Pvt Ltd.
- e. Prasha Technologies Limited.
- f. Kumar Generator house.
- g. Ashok Leyland Ltd.
- h. Powerica Limited.



- i. Supernova Engineers Limited.
- j. Bhaskar Power Products (P) Ltd.
- k. Caterpillar India (P) Ltd.
- l. Cummins India Ltd.
- m. Escorts Ltd.
- n. Greaves Cotton Ltd.
- o. Kirloskar Ltd.
- p. Mahindra & Mahindra Ltd.
- q. Honda.
- r. Perkins.
- s. Eicher.
- t. Tata Motors.
- u. Ashok Leyland.

16.0 FLAME PROOF LDB'S/ JB'S/CONTROL STATION/ SWITCHES

- a. FCG.
- b. Sudhir switchgears.
- c. Prompt Engineering Works
- d. Flame Proof equipments pvt. Ltd.
- e. Baliga Lighting Equipments Pvt. Ltd.
- f. Flexpro Electricals Pvt. Ltd.
- g. Exprotecta, Beroda.
- h. FFLP Control Gears.
- i. Sterling.
- j. Kaysons Techno Equipment
- k. Bajaj
- l. Phoenix Contact
- m. RAY Flameproof Pvt Ltd

17.0 HIGH MAST

- a. Bajaj Electricals Limited.
- b. Crompton Greaves Limited.
- c. Philips India Limited.
- d. Surya Roshani.



- e. Transrail

18.0 HIGH VOLTAGE PCC/ MCC PANELS

- a. BHEL.
- b. Control and Switchgear.
- c. Siemens.
- d. Tricolite Electrical Industries.
- e. Schneider.
- f. CGL.
- g. L&T.
- h. ABB.

19.0 INDICATING LAMPS

- a. Alstom Ltd.
- b. BCH.
- c. L&T Ltd.
- d. Siemens Ltd.
- e. Vaishno Electricals.
- f. Tecknik
- g. ABB

20.0 INDICATING METERS

- a. L&T
- b. ABB.
- c. AMCO.
- d. AE
- e. Alstom Ltd. (EE).
- f. Conzerv/Schneider
- g. Elecon Measurement Pvt. Ltd.
- h. HPL Electric & Power Pvt. Ltd.
- i. MECO Instruments Ltd.
- j. Minilec.
- k. Rishabh Instruments Pvt. Ltd.



- l. Trinity energy system.
- m. Kaycee.
- n. Salzer.
- o. Trinity
- p. Secure Meters Limited

21.0 LIGHTING FIXTURES

- a. GE Lighting Pvt. Ltd.
- b. Bajaj Electricals Ltd.
- c. Crompton Greaves Ltd.
- d. Philips India Ltd.
- e. Havells
- f. Wipro
- g. Osram
- h. Siska
- i. Halonix
- j. Surya
- k. Polycab
- l. Kawlity Photonix

22.0 LIGHTING FIXTURES – FLAMEPROOF

- a. Bajaj Electricals Ltd.
- b. Baliga Lighting Equipment Pvt. Ltd.
- c. Crompton Greaves Ltd.
- d. CEAG Flameproof Controlgear Pvt. Ltd.
- e. Flexpro Electricals Pvt. Ltd.
- f. Philips India Ltd.
- g. Sudhir Switchgears Pvt. Ltd.
- h. FCG.

23.0 MINIATURE CIRCUIT BREAKERS (MCBS) AND LIGHTING DB

- a. ABB.
- b. Hagger.
- c. Havell's India Ltd.
- d. Indo Asian Fusegear Ltd.



- e. Legrand.
- f. MDS Switchgear Ltd.
- g. Schneider.
- h. Siemens Ltd..
- i. HPL.
- j. L & T
- k. Siemens

24.0 MOULDED CASE CIRCUIT BREAKER (MCCBS)

- l. ABB.
- m. Andrew Yule.
- n. Larsen & Toubro.
- o. Schneider.
- p. Siemens.
- q. Control and Switchgear.
- r. Indo Asian,
- s. Hager.
- t. Merlin Gerin.
- u. Havell's India Ltd
- v. General Electric

25.0 PROTECTION RELAYS

- a. BCH.
- b. L&T Ltd.
- c. Siemens Ltd.
- d. Tele-mechanique & Controls (India) Ltd.
- e. Eaton
- f. Alsthom
- g. ABB
- h. Ashida
- i. Novatek Electronics
- j. Cantronics
- k. Control & Switchgear
- l. Frick Electronics
- m. Indian Technologies



- n. Rao Electromechanical
- o. Kudam Corporation

26.0 LOW/MEDIUM VOLTAGE POWER CONTROL CENTER (PCC)/ MCC/ PDB/ MLDB/ LDB

- a. ABB.
- b. BCH.
- c. BHEL.
- d. C & S.
- e. Elecmech Switchgear & Instrumentation.
- f. KMG ATOZ.
- g. L&T.
- h. Pyrotech Electronics Pvt. Ltd.
- i. Risha Control Engineers Pvt. Ltd.
- j. UDKAM PROCESS EQUIPMENT INDIA PVT. LTD
- k. Tricolite Electrical Industries.
- l. Unilec Engineers Ltd.
- m. Vidyut Control India Pvt. Ltd.
- n. Control and Schematic.
- o. Zenith Engineering.
- p. Schneider Electric,
- q. AEG,
- r. HAVELL'S,
- s. MDS
- t. Synergy System
- u. Expert Engineers
- v. R K Engineering & Infrastructure

27.0 PUSH BUTTONS

- a. BCH.
- b. Alstom Ltd.
- c. L&T.
- d. Siemens Ltd.
- e. Tele-Menchanique & Controls (India) Ltd.
- f. Vaishno Electricals.

**28.0 SWITCHES-CONTROL**

- a. BCH.
- b. Easum Reyrolle Relays & Devices Ltd.
- c. Alstom.
- d. Kaycee Industries Ltd..
- e. L&T.
- f. Siemens Ltd.

29.0 SWITCHES – 5/15A PIANO/ PLATE, SWITCH SOCKET

- a. Anchor Electronics & Electricals Pvt. Ltd.
- b. Kingal Electricals Pvt. Ltd.
- c. North-West Switchgear Ltd.
- d. Schneider
- e. Havells
- f. Cona
- g. Orient
- h. Panasonic

30.0 SWITCH SOCKET OUTLETS (INDUSTRIAL)

- a. Alstom Ltd.
- b. Best & Crompton Engineering Ltd.
- c. BCH.
- d. Crompton Greaves Ltd.
- e. Essen Engineering Company Pvt. Ltd.

31.0 SOLAR POWER SYSTEM MODULES

- a. Tata Power Solar Systems Ltd
- b. REIL,
- c. CEIL,
- d. HBL Power.
- e. Vikram Solar.
- f. Waaree Solar.
- g. Solar Semiconductor.
- h. Sonali.



- i. Mundra Solar
- j. Vikram Solar
- k. Bharat Electronics Limited
- l. Waaree
- m. Lumipex
- n. Independent Qualitative Accessories
- o. Statcon Energy
- p. Volks Energy
- q. Green Engineering

32.0 SOLAR PCU/CHARGE CONTROLLER

- a. Statcon Energy
- b. Enertech UPS Pvt Ltd
- c. Consul Nowatt
- d. OPS India
- e. Schneider
- f. Delta Electronics
- g. ABB Ltd
- h. KACO
- i. SMA
- j. HBP Power
- k. Universal Instrument

33.0 TERMINALS BLOCKS

- a. Connectwell.
- b. Controls & Switchgear Co. Ltd.
- c. Elmex Controls Pvt. Ltd.
- d. Essen Engineering Co. Pvt. Ltd.
- e. Phoenix Contact

34.0 DISTRIBUTION TRANSFORMERS

- a. ABB.
- b. Andrew Yule.
- c. Areva.
- d. BHEL.



- e. Bharat Bijlee
- f. Crompton Greaves.
- g. EMCO Ltd.
- h. Intra Vidyut.
- i. Indushree.
- j. Indcoil
- k. Kirloskar.
- l. Skippers Electricals.
- m. Transformers & Rectifiers (I) Ltd.
- n. Voltamp.

35.0 UPS SYSTEM AND INVERTER

- a. DB Power.
- b. Keltron.
- c. Hi-Rel/HITACHI.
- d. Dubas.
- e. Toshiba Corporation.
- f. Fuzi Electric Co Ltd.
- g. Emerson.
- h. Synergy System.
- i. Eaton.
- j. Enertech

36.0 GI-OCTAGONAL POLE

- a. Bajaj.
- b. Transrail.
- c. Wipro.
- d. K.L. Industries.

37.0 ELECTRICAL MOTORS

- a. Siemens.
- b. Crompton Greaves.
- c. Kirloskar.
- d. BHEL.
- e. Bharat Bijlee.
- f. Hindustan motors.



- g. Alstom.
- h. Texmo.
- i. GE India.
- j. National Motors.
- k. ABB.

38.0 ELECTRICAL PROCESS HEATER

- a. Escorts Limited, Faridabad, Haryana.
- b. Spherehot / Kanti Lal Chuni Lal & Sons Appliances Pvt Ltd.Surat.
- c. Kerone, Bhayander(E), Thane – 401105.
- d. Excel Heaters, Andheri (West), Mumbai - 400 053, India.
- e. Nirmal Industrial Controls Pvt. Ltd., Mulund(W), Mumbai - 400 080.

39.0 CATHODIC PROTECTION AGENCIES/CONTRACTOR/ VENDERS

- a. CALTECH Engineering Service.
- b. Universal Corrosion Prevention India.
- c. Cathodic Technology Limited.
- d. Cathodic Control Company Pvt. Ltd.
- e. CORRTECH International Pvt Ltd.
- f. MITCORR Cathodic Protection Pvt Ltd.
- g. Underground Pipeline & NDTs Pvt. Ltd.
- h. JG Corrosion Solution.
- i. Mercury Cathodic Protection Service.
- j. UNDTs Corrosion Service.
- k. SARK EPC Projects Pvt. Ltd.

40.0 BACKUP AGENCY FOR INTERFERENCE SURVEY & MITIGATION

- a. PLE Germany
- b. Vendor Velde
- c. Nippon Japan
- d. SSS India CIPL / interference survey.
- e. Balslev Denmark, .
- f. SSS Germany
- g. Jef Techno Slutions Pvt. Ltd.
- h. SARK EPC Projects Pvt. Ltd.

**41.0 PERMANENT REFERENCE CELL**

- a. PERMACELL/ HARCO (USA)
- b. CORRTECH (ZULU), INDIA
- c. TINKER RASOR, USA
- d. SILVION, UK

42.0 CP CABLES

- a. Brooks Cables.
- b. Nicco Corporation Ltd.
- c. CCI Ltd.
- d. Delton Cables Ltd.
- e. KEI Industries.
- f. Torrent Cables.
- g. Universal cables.
- h. Victor Cables.
- i. Associated Flexible & Wires Pvt Ltd.
- j. Asain Cables (RPG Cables).
- k. Fort Gloster (Gloster Cables Ltd).
- l. Finolex Cable.
- m. Rediant Cables.
- n. NETCO Cables Pvt Ltd.
- o. Havells Ltd.

43.0 CP SACRIFICIAL ANODES

- a. Scientific Metals Engineers Pvt. Ltd., Karaikudi
- b. PSL Holding Pvt. Ltd., Mumbai.
- c. Cathodic Controls, Bangalore.
- d. BHEL, Bhopal.
- e. Nippon Corrosion, Japan.
- f. AFIC, KSA.
- g. Platt Bros. and Company, USA
- h. Wilson Walton International.
- i. Impalloy International.



- j. Corrpro International.
- k. HOCKWAY, UK
- l. NAKABOHTEC, Japan .
- m. Cortech International
- n. Titanor Component
- o. Shakti Metals, Ahmedabad
- p. Shaktianodes Private Limited, Ahmedabad

44.0 CP PORTABLE /PERMANENT REFERENCE CELL

- a. M/S PERMACELL/HARCO, USA
- b. M/S BORIN MANUFACTURER, USA
- c. M/S M.C.MILLER, USA
- d. M/S TINKER RASOR

45.0 CPTR (AC OPERATED)

- a. Canara Electric
- b. CATHODIC CONTROL COMPANY PVT LTD.
- c. Kriston Systems

46.0 PIN BRAZING / THERMITWELD

- a. SAFETRACK, SWEDEN
- b. CadWeld
- c. BAC, UK
- d. ERICO, USA
- e. THERMOWELD, USA
- f. ERICO, EUROPE

47.0 CP SURGE DIVERter/SPARK GAP ARRESTOR (EX-D)

- a. Dhen,
- b. OBO
- c. Corrpro system
- d. Sohne
- e. Dairyland

48.0 CP SOLID STATE POLARISATION CELL.

- a. Dairyland
- b. Metricorr
- c. Rustol



- d. Dhen
- e. Kriston Systems

49.0 PETROLEUM COKE BREEZE:

- a. M/S LORESCO, USA
- b. M/S ASBURY, USA
- c. M/S GOA CARBON, GOA
- d. M/S INDIA CARBON, CALCUTTA
- e. M/S PETROCARBON & CHEMICAL COMPANY, HALDIA

50.0 CP ANODE (MMO TYPE):

- a. Corrttech
- b. Scientific Metal Engineers Karaikudi
- c. Titanor Component Ltd., Goa, India.
- d. Denora Permelic S.P.A (Italy).
- e. Oronzio De Nora S.A. Ingano Switzerland
- f. CER Anode Technologies International USA
- g. ACTEL, UK
- h. ELTECH System Corporation, Texas
- i. MAGNETO-CHEMIE, Netherlands
- j. MATCOR (USA)

51.0 HEAT SHRINK CAP FOR CP ANODE

- a. MATCOR (USA) To Cable Joint
- b. Seal For Life

**52.0 ER- PROBE (EXTERNAL CORROSION) ER- PROBE & CORROSION
COUPON ASSEMBLY**

- a. Rose Corrosion Services UK
- b. Metal Samples, USA.
- c. Roharbak Cosasco USA
- d. Caproco UK
- e. Emetricorr, Denmark

53.0 HEAT SHRINK CAP FOR ANODE TO CABLE JOINT

- a. Raychem, USA
- b. Matcor (USA)

54.0 MMO WIRE ANODES (WITH FACTORY PRE-PACKED COKE BREEZE)

- a. Matcor (USA)
- b. Covalence (USA)
- c. Berry Plastics (USA) – (Seal for Life Industries)

55.0 MMO WIRE ANODES (WITHOUT FACTORY PRE-PACKED COKE BREEZE)

- a. GROUPPO DENORA, GOA, INDIA
- b. CERANODE TECHNOLOGIES, USA
- c. TELPRO, USA

56.0 MMO TUBULAR/ STRIP/ RIBBON ANODES

- a. GROUPPO DENORA, GOA, INDIA
- b. ORANZIO DE NORA, ITALY
- c. MAGNETOCHEMIE, HOLLAND
- d. ACTEL LTD., U.K.
- e. ELTECH SYSTEMS CORPORATION, USA
- f. CERANODE TECHNOLOGIES, USA
- g. MATCOR (USA)

Note: -

For any other brought out item(s) for which the vendor list is not provided in the tender , bidders can supply those item(s) from vendors/ suppliers who have earlier supplied similar item(s) for the intended services in earlier Oil and Gas projects and the item(s) offered is in their regular manufacturing/ supply range.

- 1) The vendor/supplier should not be in the Holiday list of OWNER/ CONSULTANT/other PSU
- 2) The bidder is not required to enclose documentary evidences (PO copies, Inspection & Completion with satisfactory working certificates etc.) along with their offer, however in case of successful bidder, these documents shall required to be submitted by them within 30 days from date of Placement of Order for approval to OWNER / CONSULTANT.

**D. INSTRUMENTATION****LIST OF RECOMMENDED VENDER/SUPPLIERS OF MAJOR BOUGHT-
OUT ITEMS****1.0 PRESSURE GAUGES**

- a. AN Instruments Pvt Ltd
- b. Badotherm Process Instruments B.V.
- c. Baumer Bourdon Haenni S.A.S
- d. British Rototherm Co Ltd
- e. Budenberg Gauge Co Ltd
- f. Dresser Inc
- g. Forbes Marshall (Hyd) Pvt Ltd
- h. General Instrument Consortium
- i. H. Guru Instruments (South India) Pvt Ltd
- j. Manometer (India) Pvt Ltd
- k. Nagano Keiki Seisakusho Ltd
- l. Hirlekar Precision, India
- m. Waaree Instruments Ltd
- n. Walchandnagar Industries Ltd (Tiwac Divn)
- o. Wika Alexander Wiegand & Co GmbH
- p. Wika Instruments India Pvt Ltd
- q. Ashcroft India Pvt Ltd.
- r. ITEC Measures Pvt Ltd

2.0 TEMPERATURE GAUGES

- a. AN Instruments Pvt Ltd.
- b. Badotherm Process Instruments B.V.
- c. Bourdon Haenni S.A.
- d. Dresser Inc.
- e. General Instruments Consortium
- f. H. Guru Instruments (South India) Pvt Ltd



- g. Nagano Keiki Seisakusho Ltd
- h. Solartron ISA
- i. Walchandnagar Industries Ltd (Tiwac Divn)
- j. Wika Alexander Wiegand & Co GmbH
- k. Wika Instruments India Pvt Ltd
- l. Pyro Electric, Goa
- m. Ashcroft India Pvt Ltd.
- n. ITEC Measures Pvt Ltd

3.0 TEMPERATURE ELEMENTS INCLUDING SKIN TYPE

- a. ABB Automation Ltd
- b. Altop Industries Ltd
- c. Bourdon Haenni S.A.
- d. Detriv Instrumentation & Electronics Ltd
- e. General Instruments Consortium
- f. Japan Thermowell Co Ltd
- g. Tecnomatic S.P.A
- h. Tempsen Instrument India Ltd
- i. Thermo Electric Co. Inc.
- j. Thermo-Couple Products Co
- k. Thermo-Electra B.V.
- l. Wika Alexander Wiegand & Co GmbH
- m. Altop Industries Ltd., Baroda
- n. Nagman Sensors (Pvt.) Ltd.
- o. Pyro Electric, Goa
- p. ITEC Measures Pvt Ltd

4.0 POSITIVE DISPLACEMENT FLOW METERS

- a. RMG (Germany)
- b. Elster Instromet
- c. Romet
- d. Dresser
- e. Itron
- f. FMG
- g. Common



- h. Metreg
- i. Raychem RPG
- j. Vemmtec

5.0 TURBINE FLOW METER

- a. Daniel
- b. Elster Instromet
- c. Itron
- d. RMG
- e. Rockwin

6.0 ELECTRONIC VOLUME CORRECTOR

- a. Elgas
- b. Itron
- c. Plum
- d. Pietro Fiorentini

7.0 ORIFICES (METER RUN, FLOW CONDITIONER, ORIFICE PLATE AND ASSEMBLY)

- a. Emerson
- b. FMC, USA
- c. Pietro Fiorentini S.P.A (Italy)
- d. Canalta Controls, Canada

8.0 ULTRASONIC FLOW METERS

- a. Daniel (USA)
- b. RMG (Germany)
- c. Instromet International (Belgium)
- d. Sick Maihak, Germany
- e. FMC, Germany

9.0 MASS FLOW METERS

- a. Daniel Measurement & Control Asia Pacific
- b. Endress + Hauser Instruments International



- c. FMC Measurements Solutions
- d. Heinrichs Messtechnik GMBH
- e. Rheonik MessGerate GMBH

10.0 FIELD INSTRUMENTS (P, DP, F, L, T)

- a. ABB Ltd
- b. Honeywell
- c. Fuji Electric Instruments Co Ltd
- d. Yokogawa
- e. Invensys India Pvt.Ltd

11.0 LEVEL GAUGES/ LEVEL INSTRUMENTS

- a. Bliss Anand
- b. Chemtrols
- c. V-Automat
- d. Levcon
- e. Nivo Controls
- f. Sbeletro Mechanicals
- g. TRAC

12.0 PRESSURE REGULATOR AND SLAM SHUT VALVE

- a. Pietro Fiorentini S.P.A. (Italy)
- b. Emerson
- c. RMG-Regel Messtechnik (Germany)
- d. Mokveld Valves BV (Netherlands)
- e. Schlumberger (USA)
- f. Gorter Controls B V (Netherlands)
- g. Instromet International NV
- h. Nirmal Industrial Controls Pvt Ltd. (up to 6" size only)
- i. ESME Valves Ltd
- j. Kaye & Macdonald Inc.



- k. Nuovo Pignone S.P.A (Italy) (GE Oil Co.)
- l. Richards Industries (Formerly Treloar)
- m. Samson AG Mess-und Regeltechnik
- n. Tormene Gas Technology
- o. Dresser Inc, USA (upto 8" size, 300# class only)

13.0 PRESSURE SAFETY VALVES

- a. Keystone Valves (India) Pvt. Ltd.
- b. Larson & Toubro Ltd.
- c. Lesser GmbH & Co KG
- d. Mekaster Engg Ltd..
- e. Tyco Sanmar Ltd. (New Delhi)
- f. Anderson Greenwood Crosby
- g. BHEL (Trichy)
- h. Curtiss Wright Flow Control Corporation
- i. Dresser Inc.
- j. Fukui Seisakusho Co. Ltd
- k. Nakakita Seisakusho Co Ltd
- l. Nuovo Pignone S.P.A (Italy) (GE Oil co)
- m. Parcol S.P.A
- n. Safety Systems UK Ltd
- o. Tai Milano S.P.A
- p. Weir Valves & Controls France
- q. Bliss Anand Pvt Ltd.

14.0 CONTROL PANEL & ACCESSORIES

- a. Keltron Controls Ltd., Kerala
- b. Elechmec Corporation Ltd., Mumbai
- c. Industrial Controls & Appliances Pvt. Ltd.,
- d. Alstom System Ltd., Noida
- e. Emerson Process Management (I) Pvt. Ltd.
- f. ABB Instruments Ltd., New Delhi
- g. Larsen & Toubro Ltd.
- h. Control & Automation, New Delhi
- i. GE Fanuc Systems Pvt. Ltd., New Delhi
- j. Rockwell Automation (I) Ltd., Ghaziabad



- k. Honeywell Automation Ltd.
- l. Rittal
- m. Pyrotech Elcronics Pvt Ltd.
- n. Positronics Pvt Ltd.
- o. Electronics Corporation of India Ltd.
- p. Phoenix Contact (I) Pvt. Ltd

15.0 JUNCTION BOXES AND CABLES GLANDS

- a. Ex-Protecta
- b. Flameproof Control Gears
- c. Baliga
- d. Flexpro Electricals
- e. RAY Flameproof Pvt Ltd (Flameproof Weatherproof)

16.0 CONTROL AND SIGNAL CABLES

- a. Associated Cables
- b. Brook
- c. Associated Flexibles & Wires (Pvt) Ltd
- d. Universal Cables Ltd, India
- e. Delton Cables Ltd, India
- f. KEI Industries Ltd INDIA
- g. CMI Limited
- h. Cords Cable Industries Ltd, India
- i. Elkay Telelinks (P) Ltd., India
- j. Udey Pyrocables Pvt Ltd, India
- k. Goyolene Fibres (I) Pvt Ltd, India
- l. Netco Cable Industries Pvt Ltd, India
- m. Nicco Corporation Ltd, India
- n. Paramount Communications Ltd, India
- o. Polycab Wires Pvt Ltd, India
- p. Radiant Cables Pvt Ltd, India
- q. Reliance Engineers Ltd., India
- r. Suyog Electricals Ltd, India
- s. Thermo Cables Ltd

**17.0 GAS DETECTION SYSTEM**

- a. Crowcon Detection Instruments Ltd
- b. Detection Instruments (I) Pvt Ltd
- c. Detector Electronics Corporation
- d. Drager Safety AG & Co. KGAA
- e. General Monitors Ireland Ltd
- f. Mine Safety Appliances Company
- g. MSA – Mines Safety Appliances(India) Ltd
- h. Industrial Scientific Oldham France S.A.
- i. Riken Keiki Co Ltd
- j. Simrad Optronics Icare
- k. Honeywell Analytics
- l. Net Safety Monitoring Inc.
- m. Simtronics SAS
- n. Pollution Protection Systems Mumbai Pvt Ltd

18.0 MOV ACTUATOR:

- a. Rotork- UK, USA & INDIA
- b. Limitorque
- c. Auma- India
- d. Biffi- Italy

19.0 PNEUMATIC ACTUATOR (SOLENOID OPERATED ON-OFF TYPE)

- a. Metso Automation
- b. Tyco
- c. Samson Controls
- d. L&T
- e. Emerson
- f. Fisher
- g. Masoneilan Process Control
- h. Instrumentation Limited (IL)-Palghat
- i. Micro Finish
- j. Rotex

20.0 SOLENOID VALVES



- a. Avcon
- b. Festo

21.0 ELECTRO – HYDRAULIC ACTUATOR

- a. Avcon Rotork controls (Deutschland Gmbh)
- b. Biffi Italia Srl
- c. Ledeen (Italy)
- d. Virgo Valves and Controls Ltd.-India
- e. Limittorque
- f. Reineke
- g. Voith
- h. Bettis
- i. Rotork- UK, USA & INDIA
- j. Rotex
- k. Schuck Group

22.0 GAS OVER OIL ACTUATOR

- a. Biffi Italia Srl,
- b. Ledeen(Italy)
- c. Virgo Valves & Control Ltd.-India,
- d. Voith,
- e. Bettis,
- f. Rotork-UK, USA, India,
- g. Rotex,
- h. Schuck Group,
- i. Valve Italia.

23.0 OFC

Manufacture/ Procurement, Testing and supply of suitable OFC Joint closures including all necessary accessories of any of the following make:

- a. Raychem
- b. 3M
- c. Siemens
- d. Any other make from the approved vendor list of client with supporting paper.

**24.0 FLOW CONTROL VALVES**

- a. Fouress Engg. (New Delhi)
- b. Fisher Xomox (New Delhi)
- c. MIL Control Ltd. (Noida)
- d. KOSO India Pvt Ltd
- e. Samson Control (Thane)
- f. Dresser Valves India Pvt Ltd.
- g. Fisher Controls
- h. Valvitalia Italy
- i. CCI Valve technology
- j. Flowserve Pvt Ltd.
- k. Metso Singapore Pvt Ltd.
- l. Instrumentation Ltd Palghat
- m. Dresser Inc. USA

25.0 FLOW COMPUTERS

- a. Emerson
- b. Instromet International (Belgium)
- c. FMC Measurement Solutions (UK)
- d. RMG (Germany)
- e. OMNI Flow Computers Inc.
- f. Thermo Fisher, USA

26.0 INDICATORS & CONTROLLERS

- a. Yokogawa
- b. Eurotherm Chessel
- c. Honeywell
- d. Emerson

27.0 BARRIERS

- a. MTL
- b. STHAL
- c. P&F
- d. Phoenix Contact (I) Pvt. Ltd.

28.0 GAS CHROMATOGRAPH

- a. ABB



- b. Emerson
- c. Instromet International, NV
- d. RMG Regal+Messtechnik GmbH
- e. Yokogawa

29.0 I/P CONVERTERS

- a. ABB
- b. Emerson
- c. IMI Watson Smith Ltd.
- d. Moore Controls Ltd
- e. Shreyas Instruments Pvt Ltd, India
- f. Thermo Brandt Instruments

30.0 SS FITTINGS, INSTRUMENT VALVES & MANIFOLDS**30.1 FOR CNG WORK:**

- a. DK-LOK
- b. Swagelok Co.
- c. Parker
- d. Dawsons Tech Components LLP
- e. ASTEC Valves & Fittings Pvt Ltd
- f. Thomas & Brian Mfg. Pvt. Ltd

30.2 EXCEPT CNG WORK:

- a. Swagelok Co.
- b. Parker
- c. Aura INC.
- d. HOKE
- e. Excelsior Engineering works
- f. Swastik Engineering works India
- g. Comfit and valves pvt ltd
- h. Arya craft and engineering Pvt ltd
- i. DK lok
- j. ASTEC Valves & Fittings Pvt Ltd
- k. Dawsons Tech Components LLP

31.0 SS TUBES



31.1 FOR CNG WORK:

- a. Swagelok Co.
- b. Parker
- c. Sandvik
- d. Jindal Saw
- e. Tubacex Tubes and Pipes Private Ltd
- f. Krystal Global Engineering Ltd.

31.2 EXCEPT CNG WORK:

- a. Swagelok Co.
- b. Parker
- c. Sandvik
- d. Heavy metal and tube limited
- e. Nuclear fuel complex India
- f. Scorodite
- g. Ratnamani Metals and Tubes
- h. Jindal Saw

**E. SHOP & FIELD PAINTING****LIST OF RECOMMENDED VENDER/SUPPLIERS OF MAJOR BOUGHT-
OUT ITEMS****1.0 INDIAN VENDORS**

- a. Asian Paints (I) Ltd.
- b. Berger Paints Ltd.
- c. Goodlass Nerlolac Paints Ltd.
- d. Jenson And Nicholson Paint Ltd & chokuGu Jenson & Nicholson Ltd.
- e. Shalimar Paints Ltd.
- f. Sigma Coating, Mumabai
- g. CDC Carboline Ltd.
- h. Premier Products Ltd.
- i. Coromandel Paints & Chemicals Ltd.
- j. Anupam Enterprises
- k. Grand Polycoats
- l. Bombay Paints Ltd.
- m. Vanaprabha Esters & Glycer, Mumbai
- n. Sunil Paints and Varnishes Pvt. Ltd.
- o. Courtaulds Coating & Sealants India (Pvt.) Ltd.
- p. Mark-chem Incorporated, Mumbai (for phosphating chemicals only)
- q. VCM Polyurethane Paint (for polyurethane Paint only)

2.0 FOREIGN VENDORS FOR OVERSEAS PRODUCTS

- a. Sigma Coating, Singapore
- b. Ameron, USA
- c. Kansai Paint, Japan
- d. Hempel Paint, USA
- e. Valspar Corporation, USA
- f. Courtaulds Coating, UK.

**Notes:**

1. Bidder can select equipment of two different makes, selected from this VENDOR LIST and mention the same in the checklist for technical evaluation attached with the tender. The offered bid must include filled datasheet indicating make, model, size, rating of offered instrument/ equipment duly supported by sizing calculation of offered equipment (wherever applicable).
2. Vendors who have already supplied above equipment in other terminals of client, shall also be considered qualified for this tender provided the supplied equipment are commissioned and running successfully and they have not been put on holiday.
3. Equipment / Instruments of any make which is offered by one bidder and acceptable to client shall be accepted for other bidder also. After placement of order, on request of the successful bidder list of other qualified makes for a particular item (for which successful bidder wants to change the vendor) shall be provided.
4. Bidder shall take prior approval of the make / model no of the offered item and it shall be from the list given above. However additional vendors will be considered in exceptional cases, provided they have supplied for similar application to reputed gas transmission/distribution companies, in quantities at least half the numbers being supplied for this tender, and working satisfactorily for minimum 6 months. Documentary evidence substantiating above shall be submitted for taking approval.

**F. FOR PE & LMC WORK (GI/CU)****1.0 MDPE PIPE**

- a. Mukand Poly Products,
- b. Dewa Polymers Pvt. Ltd.

2.0 MDPE FITTINGS & MDPE VALVES

- c. Aliaxis,
- d. George Fischer,
- e. Al-Aziz,
- f. Kimplas,
- g. Banides,
- h. Agru,
- i. Friatech,
- j. Plasson

3.0 GI PIPE

- a. Swastik Pipe Ltd.
- b. Jindal Industries Ltd.
- c. Vishal Pipes Ltd.
- d. Indus Tubes Ltd
- e. Advance steel Tubes Ltd.
- f. Good Luck Tubes Ltd.
- g. Surya Roshni Limited
- h. APL Apollo Tubes Limited
- i. Jindal Pipes Limited
- j. RK Steel Manufacturing Company Private Limited
- k. PSL Tubes Limited

4.0 CASTING GI FITTINGS

- a. Sarin Industries Ltd.
- b. Jupiter Metal Industries Ltd.
- c. Jainsons Industries Ltd.
- d. Jinan Meide Casting Co. Ltd.
- e. Green Malleable Pvt. Ltd.
- f. Chandan Enterprises
- g. Unique Pipe Fitting Co

**5.0 FORGED GI FITTING (FOR HIGH RISE SEGMENT)**

- a. Jainsons Industries
- b. B.M. Meters Pvt. Ltd.

6.0 COPPER TUBES & FITTINGS

- a. Jay Banas Mehta Tubes Limited- Trade Mark "MEXFLOW"
- b. Rajco metal (Tubes & Fittings)
- c. Paras Industries
- d. MERCURE METAL & ALLOYS PVT LTD
- e. Chandan Enterprises (Fittings only)

7.0 BRASS VALVES

- a. Universal srl, Italy
- b. Tiemme Raccorderie Sede, Italy
- c. Enolgas Bonimu s.a.s., Italy
- d. Fratelli Fortis s.r.l, Italy
- e. Giacomo Climbrio, Italy
- f. Parker Hannifin S.P.A., USA
- g. Singapore Valve & Amp; Fittings Pte Limited, Singapore /Bengaluru
- h. Rubinetterie Utensilerie Bonomi (RUB), Italy
- i. Zhegiang Valogin Technology Co. Ltd., China,
- j. Ningbo Zhiqing Industrial Co. Ltd., China,
- k. Zhegiang Dunan Valve Co. Ltd.,
- l. Ningbo Huaping, China.
- m. Chandan Enterprises

8.0 Isolation & Appliance valves

- a. Chandan Enterprises

9.0 BRASS FITTINGS

- a. Chandan Enterprises
- b. Paras Industries Ltd.
- c. Chokhawala Distributors – Brass Adaptor.

10.0 STEEL RE-INFORCED RUBBER HOSE (TYPE-4)

- a. Super Seal Flexible Hose Ltd.



- b. Suraksha Products Pvt. Ltd.
- c. Vansh Industries
- d. T & L Gases

11.0 CORRUGATED FLEXIBLE METAL HOSES (ANACONDA)

- a. KPC Flex Tubes
- b. Vestas Hose Division
- c. Alpha Flexi Tubes
- d. Chandan Enterprises

Note:

1. Vendor may procure material from any of approved vendors listed.
2. For equipment/components other than the above, vendor shall submit past track record for the proposed sub-vendors and obtain written approval from Owner / Consultant before placing order.
3. In case of exigencies like long delivery periods from approved vendors, the contractor shall list down the proposed suppliers/vendors for such items and submit the same for owner review/approval along with necessary documents/PTR.
4. Non-acceptance of a particular proposed vendor due to any reasons whatsoever shall not be a cause of schedule and cost implication. If equipment is sourced from outside India, vendor shall obtain prior approval for make of equipment before placement of order.

Above mentioned vendor list is tentative and further addition/deletion may be done as per discretion of Owner/VCS.





Energising Quality

LIST OF AUTHORIZED THIRD-PARTY INSPECTION AGENCY (TPIA)

DOC. NO.- VCS-C&P-TPIA-001

SL. NO.	NAME OF TPIA
1	Det Norske Veritas (DNV)
2	Germanischer Lloyd Industrial Services GmbH
3	Bureau Veritas (India) Pvt. Ltd.
4	Moody International (India) Pvt. Ltd. (Industry Services Division)
5	SGS India Pvt. Ltd.
6	Certification Engineer International Limited (CEIL)
7	TÜV SÜD South Asia Pvt. Ltd.
8	ABS Industrial Verification (India) Pvt. Ltd.
9	Lloyd Register of Industrial Services
10	IRCLASS Systems and Solutions Private Limited
11	Tata Projects Limited
12	International Certification Services Pvt. Ltd.
13	TUV India Pvt. Ltd., Industrial Services Division
14	Intertek India Pvt. Ltd. (Industry Services Division)
15	Quality Austria Central Asia Pvt. Ltd.
16	Edlipse Engineering Global Pvt. Ltd.
17	TUV-Rheinland

 Energising Quality		PROJECT NUMBER: VCS-HOGPL-C261162					
QUALITY ASSURANCE PLAN FOR ODORIZATION UNIT					TOTAL SHEET NO.		05
DOCUMENT NO.	C261162	00	ME	QAP	3001		
<p style="text-align: center;">ANNUAL RATE CONTRACT FOR SUPPLY OF ODORISATION SKID AND CAMC FOR THREE YEARS IN THE STATE OF NAGALAND GAS</p>							
C0	31.07.2025	ISSUED FOR CLIENT REVIEW			YK	AB	RKP
REV	DATE	DESCRIPTION			PREP	CHK	APPR

S.NO.	OPERATION / PARAMETER	CHARACTERISICS / PARAMETERS	ACCEPTANCE CRITERIA & CERTIFICATION	VENDOR	TPIA	CLIENT/ PMC	REMARKS
Bought Out items & Equipment details							
1	Skid/Canopy Dimensional Report	Dimension Reports	As per Technical specification & Foundation GAD	P	W/R	R	
2	Odorant storage Tank						
2(a)	Chemical composition of Material	Review of MTC	MTC By supplier / Chemical composition as per standards Material	P	W/R	R	
2(b)	Hydrostatic Test at 3.9 kg/cm ² (bar(g))	Performance Check / inspection Report	ASME SEC VIII Div. 1 latest edition	P	W/R	W	
2(C)	Dye Penetrant test at Vendor's premises	Performance Check / Inspection Report	ASME Sec V latest edition	P	W/R	W	
3	Pressure Relief Valve						
3(a)	Review of Test Certificates	Review of MTC	Chemical composition of PRV as per API-520	P	W/R	W	
3(b)	Crack Pressure Test	Performance & seals Check / inspection Report	Cracking set pressure check as per Approved data sheet / Technical spec.	P	W/R	W	
4	Level Indicator & Transmitter						
4(a)	Review of Test Certificate	Review of MTC Certificates	As per Technical specification & Data sheet / EN 10204	P	W/R	W	
4(b)	Calibration Certificates	Review of Calibration certificates	As per Technical specification & Data sheet	P	W/R	W	
5	Pressure Gauge						
5(a)	Review of Test Certificate	Review of MTC Certificates	As per Technical specification & Data sheet / EN 10204	P	W/R	W	
5(b)	Calibration Certificates	Review of Calibration certificates	As per Technical specification & Data sheet	P	W/R	W	
6	Pressure Regulator						
6(a)	Review of Test Certificate	Review of MTC Certificates	As per Technical specification & Data sheet / EN 10204	P	W/R	W	
6(b)	Calibration Certificates	Review of Calibration certificates	As per Technical specification & Data sheet	P	W/R	W	
6(c)	Set pressure Test	Performance check	EN 10204	P	W/R	W	

7	Tubing's & Piping						
7(a)	Tubes & Piping	Chemical, Mechanical, Hydro test, Physical, Heat Chart	As per technical specifications/Data sheet	P	W/R	R	
8	Fittings	Visual, Dimensional, Fitment & Alignment as per P&ID shown, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items	Technical specification & Approved data sheets / Chemical composition as per ASTM A629	P	W/R	R	
9	Valves						
9(a)	Review of MTC	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items, Cv verification w.r.t data sheet	Technical specification & Approved data sheets / Chemical composition as per ASTM-A-479	P	W/R	R	
10	Solenoid Valve & manifold	Performance report, Fitment & alignment , Test certificates, Compliance report , chemical & physical reports	As per OEM specifications/Data sheet	P	W/R	R	
11	Pressure Transducer & Transmitter	Location as per P&ID, Fitment & alignment, calibration report, Test certificates of bought out items, pressure test, Operational & functional, current consumption w.r.t pressure, IP ratings, supply voltage, Output signal voltage	Technical specification & Approved data sheets	P	W/R	R	
12	Check Valve	Chemical, Mechanical, Hydro test, Physical, Heat chart	As per Technical specification/Data sheet/ calculation report	P	W/R	R	
13	Pressure Regulating Valve/Direction & flow control valve	Test/compliance/performance/ warranty certificates	As per OEM specifications/Data sheet	P	W/R	R	
14	Flame arrester	Test report, compliance report, Routine test ,Physical & chemical report	As per OEM specifications/Data sheet	P	W/R	R	
15	ESD & Hooter	Fitment & alignment , Test certificates, Compliance report , chemical & physical reports	As per OEM specifications/Data sheet	P	W/R	R	
16	Solenoid Valve & manifold	Performance report, Fitment & alignment , Test certificates, Compliance report , chemical & physical reports	As per OEM specifications/Data sheet	P	W/R	R	
17	Pneumatic Actuators	Performance report, Fitment & alignment , Test certificates, Compliance report , chemical & physical reports	As per OEM specifications/Data sheet	P	W/R	R	

18	Flameproof Junction Box	Test report, compliance report, Physical & chemical report	As per OEM specifications/Data sheet	P	W/R	R	
19	Control panel	Test report, compliance report, Routine test ,Physical & chemical report	As per OEM specifications/Data sheet	P	W/R	R	
20	Vacuum pump	Performance report, Fitment & alignment , Test certificates, Compliance report , chemical & physical reports	Technical specification & Approved data sheets	P	W/R	R	
21	SS Needle / Block & Bleed valve	Chemical, Mechanical, Hydro test, Physical, Heat Chart	As per Technical specification/Data sheet	P	W/R	R	
22.	Gas filter	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test report, Operational & functional, Leak test, Hydro test, filter sizing calculation	Technical specification / Approved data sheets/ Filter Sizing calculation sheet	P	W/R	R	
23.	Filter Elements	Visual, Dimensional, Fitment & Alignment, Test certificates of bought out items Operational & functional, Leak test, Hydro test, filter sizing & pressure drop calculation with elements	Technical specification / Approved data sheets/ Filter Sizing calculation sheet	P	W/R	R	
24.	Pressure switch	Performance report, Fitment & alignment , Test certificates, calibration, Compliance report , chemical & physical reports	As per OEM specifications/Data sheet	P	W/R	R	
25.	Package CCOE approval certificates	Valid PESO package approval certificates, Number plate embossing with PESO no. & other details.	As per Technical specification & approved Name plate	P	W/R	R	
26.	All electrical PESO/ATEX/DEKRA certificates	Valid PESO certificates of all electrical & hazardous components	As per PESO certificates	P	W/R	R	
Complete Assembly Simulation & Testing Details							
27.	Complete Assembly @ pressure Leak Test	Leak Test at 6 kg/cm2(g)	Technical specifications & OEM test procedure.	P	W	W	
28.	Complete Assembly @ static pressure Leak Test	Leak Test Throughout on all Joints By using Soap solution and Holding Time as per OEM Test procedure	Technical specifications & OEM test procedure.	P	W	W	
29.	Performance of complete odorizing unit	Performance test as per Approved Control Philosophy/ Logic diagram	Technical specifications & Approved Control Philosophy	P	W	W	

Notes:

1. The above testing and acceptance criteria are minimum requirements; however, manufacturer shall ensure that the product shall also comply to the additional requirements as per particular Technical Specification (PTS) and Data Sheet.
2. The supplier shall submit their own detailed QAP prepared on the basis of above / Technical specification for approval of Owner/Owner's representative.
3. Supplier shall submit calibration certificates of all instruments/Equipment to be used for inspection and Testing to TPIA with relevant procedures and updated standards for TPIA review/Approval. All reference codes / documents shall be arranged by vendor for reference of TPIA at the time of inspection.
4. Owner / Owner's representative include TPIA will have the right to inspect activity of manufacturing at any time.
5. TPIA along with Owner / Owner's representative shall review/approval all the documents related to QAP/Quality manuals/Drawings etc., submitted by supplier.
6. Contractor shall in coordination with supplier/sub vendor shall issue detailed production and inspection schedule indicating the dates and the location of facilities Owner/Owner's representative and TPIA to organize inspection.
7. Special manufacturing procedure have to be specially approved or only previously approved procedures have to be used, in case of conflict between specification more stringent condition shall be applicable.
8. The supplier shall submit separate control logic sheet along with actuator/SOV operation philosophy.