



TECHNICAL SCOPE OF WORK
OPERATION & MAINTENANCE WORKS FOR
STEEL PIPELINE NETWORK & ASSOCIATED FACILITIES

DOCUMENT NO:
GEL/TS/STEEL/SERVICE/O&M/SOW

TABLE OF CONTENTS

1. OVERVIEW	5
1.1 GENERAL DESCRIPTION	5
1.2 OPERATION & MAINTENANCE POLICY	5
1.3 O&M POLICY IMPLEMENTATION.....	6
1.4 NATURAL GAS COMPOSITION & PROPERTIES.....	7
1.5 CGD SYSTEM FACILITIES / NETWORK.....	8
1.6 BRIEF DESCRIPTION OF CITY GAS DISTRIBUTION NETWORK	8
1.7 CITY GAS DISTRIBUTION SYSTEM COMPONENTS.....	9
1.8 CATHODIC PROTECTION	10
1.9 ODORANT SYSTEM & STORAGE / ODORANT HANDLING MANAGEMENT.....	10
2. SCOPE	12
2.1 DEFINITIONS	14
2.2 REFERENCE CODE AND STANDARD.....	16
3. GENERAL TERMS & CONDITIONS OF CONTRACT	18
3.1 GENERAL SCOPE.....	18
3.2 CONTRACTOR'S SCOPE OF WORK.....	18
3.3 GUJARAT ENERGY'S SCOPE OF WORK	31
3.4 WORK MANAGEMENT	32
3.5 INSPECTION AND DOCUMENTATION.....	34
3.6 HEALTH, SAFETY AND ENVIRONMENT (HSE).....	36
4. ANNEXURES	42

1. OVERVIEW

1.1 GENERAL DESCRIPTION

Gujarat Energy Ltd. (GEL) (Est. Gujarat Gas Ltd.), developed City Gas Distribution Networks for Distributing Natural Gas to Industrial/Commercial, Domestic Customers and CNG Stations in various cities across Gujarat, DNH, Rajasthan, Maharashtra, Punjab and Haryana.

For catering to its diverse customer base company has constructed steel pipeline network and various allied facilities like CGS, DRS/DPRS/IPRS/CPRS/IMS etc. for pressure reduction & CNG to meet the demand of entire gamut of customers across operations. To provide uninterrupted supply to its customers, company needs to carry out preventive and corrective maintenance of its Steel network in addition to minor modifications for upgrading the existing facilities / improve the asset integrity.

This document summarizes the technical requirements and specifications for work to be executed for the maintenance of the underground steel pipe line, above ground piping system and other associated facilities including repair, modification, up gradation and shutdown of the network.

SOR is prepared for obtaining charges to be paid for various services / supply of materials that may be needed while performing the job under this **CONTRACT**. To facilitate both the **CONTRACTOR** and **GEL** to take up any job of importance under this contract, all the activities needed to be executed are broken down in to smaller activities based on execution to be done.

CONTRACTOR has to place teams consisting of the manpower, mentioned in the tender document for execution of the job. In addition to the manpower, they have to maintain & supply machinery, equipment, material tools and tackles along with non-sparking tools as needed for attending any emergency and preventive & corrective maintenance. Manpower, Equipments and materials to be mobilized mandatorily is as per the list mentioned in this document. Some of the major equipment can be hired by the **CONTRACTOR**, but he has to give written assurance that they will be available as and when required for attending planned /scheduled maintenance as well as breakdown maintenance or any emergency.

Each team mobilized against the fixed cost to be paid by the **OWNER** will be assigned a specific geographical area which will be known from now onwards as “AREA OF OPERATION”, defined in this tender document, within which they have to perform the planned / scheduled activities, Breakdown and emergencies strictly as per the Service Level Agreement.

1.2 OPERATION & MAINTENANCE POLICY

GEL is committed to carry out management of operation & maintenance of its city gas distribution systems, at all location, with the prime objective of ensuring safe and reliable gas supply to its customers, integrity of network, prevention of accidents to minimize loss of life or bodily injury to **CONTRACTOR** and his own employees and damage to company’s physical assets.

In fulfilling this commitment, which is as essential and equally important as objectives, **GEL** will provide and maintain a comfortable, safe and healthy work environment and protect environment and public against foreseeable hazards resulting from operations.

1.3 O&M POLICY IMPLEMENTATION

1.3.1 COMPLIANCE WITH OPERATION AND MAINTENANCE REQUIREMENTS

The application of the best operation and maintenance practices, for the city gas distribution system, to ensure safe and uninterrupted gas supply, integrity of network, minimizes risk to personnel and property. **CONTRACTOR** will meet requirements of operation and maintenance of facilities and equipment, as practiced by **GEL**, and as covered in this document including engineering standards.

1.3.2 OPERATING STANDARDS AND INSTRUCTIONS

Compliance with O&M standards including relevant PNGRB standards and instructions will be consistently enforced for both **GEL** personnel and **CONTRACTORS** alike, as it is proved that flaws/ risks that cannot be eliminated through design are controlled by operating standards and instructions.

1.3.3 EDUCATION AND TRAINING

Working on commissioned network is critical and hence it is responsibility of **CONTRACTOR** to deploy competent work force at site. Activity wise all involved work force shall be provided with ongoing education and training as well as help to develop those skills that are required to perform, supervise and manage assigned tasks without mishap at **CONTRACTORS** own expenses. The training will be exhaustive including various job skills and HSE management, especially, on the job and off the job safety, emergency handling, PPEs, etc. Training to be imparted by **CONTRACTOR** at his own cost. In case **GEL** is providing training for some of the activities, the same will be imparted at **CONTRACTORS** own cost.

1.3.4 RESPONSE TO ACCIDENTAL OCCURRENCES

The site-specific effective emergency will be handled as per **GEL** ERDMP and as per the guidelines given in this document. These should include measures to contain or control an emergency or disaster when an accident occurs to minimize the loss of resources and reporting & investigation system to determine the cause of the accident, and the adoption of corrective actions to avoid a recurrence.

1.3.5 CONTRACTORS' WORK FORCE SAFETY

The company's personnel, will monitor operation and maintenance management, to ensure that activities are performed in conformity with this O&M policies, statements and practices and do not violate the set safe practices and procedures.

1.3.6 ACCOUNTABILITY

CONTRACTOR and all their work force shall be held accountable for personal and functional O&M performance. An important factor in a **CONTRACTOR'S** overall job performance evaluation will be, how well the **CONTRACTOR** meets their skill and safety responsibilities.

1.4 NATURAL GAS COMPOSITION & PROPERTIES

When handled properly Natural Gas is a safe fuel. It is a non-poisonous, non-toxic combustible source of energy.

Natural Gas is composed essentially of methane with minor quantities of ethane, propane, carbon dioxide and traces of higher hydrocarbons and oxygen. It has a specific gravity of about 0.6, which means it is only 60% as heavy as air and it will rise under normal atmospheric conditions. Thus, it disperses in to air very easily, if leaked.

Natural Gas within the distribution system will be given a distinctive odor, which will be designed to be detectible by the nose at concentrations of 2 ppm gas in the atmosphere.

Natural Gas will burn within the range of 5% and 15% of gas in air (by volume), and it is readily ignited by spark or other forms of ignition within this range. Thus, it is safer due to wide flammability limit.

From Asphyxiation - through over exposure to natural gas, usually in a confined space, caused by inadequate ventilation or mechanical or accidental failure of equipment.

From Explosion - through an accumulation of escaping gas, also usually in a confined space, being ignited when mixed with air.

From Fire - through the uncontrolled burning of gas, usually after an explosion.

From Over Pressure - through submitting gas facilities such as regulators, valves, gauges, etc, to pressures in excess of their maximum working pressure.

The typical Natural Gas composition & properties are given below

Typical Composition of Natural Gas

Methane	82% -99% Mole
Ethane	1% to 5% Mole
Propane	1% to 5% Mole
Butane	0.1% to2% Mole
Pentane	0% to 1% Mole
Hexane	0% to 1% Mole
CO ₂	0% to 1% Mole
Nitrogen	0% to 1% Mole
Other Properties	
Specific Gravity (air – 1.0)	0.56% to 0.67%
Boiling Point	-161deg C
Melting Point	-182deg C
Flash Point	-161deg C
Auto Ignition Temperature	560deg C
Flammable Limit	5% to 15% by volume in air.

Note: Gas composition / characteristic may vary subject to source available from time to time

1.5 CGD SYSTEM FACILITIES / NETWORK

City Gas distribution (CGD) network is a facility or set-up developed for distribution of piped natural gas (PNG), mainly as a fuel to domestic, commercial and industrial customers. The system receives high pressure and unodorised gas from gas transporters / Suppliers, through transmission/sub transmission line and supplies the same to the customers after filtration, pressure reduction/ regulation, odorization and check metering.

The pressure reduction/ regulation may be in four/three stages depending upon the network design selected. The first pressure reduction is carried out at CGS, second at CPRS / DRS / DPRC, third at Service Regulator and fourth and final at customer premises. The odorization for imparting smell to gas is installed at City Gate Station (CGS). The system consists of City Gate Station (CGS), underground steel pipeline distribution network, CPRS / DRS / DPRC, MP PE pipeline network, service regulators, LP PE pipeline network, and customer connections. The size, rating and type of the major and sub assets are selected based on the pressure rating, capacity and other applicable criteria considered for whole city gas distribution system for meeting the current and future customer potential, health and safety of employees, customers and public at large, environment protection, and complying the statutory, legal requirements, national and international technical and safety standards/ practices. The main objective of the distribution company is to ensure safe and uninterrupted gas supply to customers for 24 hours, 365 days round the clock, by deploying resources, for handling various customer complaints about gas leak/ escape, customer queries and carrying out planned operation and maintenance activities, as per annual operation and maintenance plan for ensuring safe and uninterrupted gas supply and integrity of network.

1.6 BRIEF DESCRIPTION OF CITY GAS DISTRIBUTION NETWORK

Construction, including testing and commissioning, generally carried out in accordance with the requirements of PNGRB standards and ASME B31.8.

1.6.1 Natural Gas Pipeline Network

- Primary Network - 7 to 49 bar g
- Secondary Network. - > 0.5 bar g < 5 bar g
- Tertiary Network - < 0.110 bar g

1.6.2 High-Pressure Network

This applies to the pipelines laid by transporters for connecting the Gas transmission to the “City Gate Station”.

1.6.3 Primary Network

Primary Network is generally constructed by using Carbon Steel pipelines of API-5L Grade – B, X42 to X-65 material specification and sizes varies from 4" to 16" in distribution network. The 3 Layer PE/FBE coated pipes are welded, NDT tested, laid underground at normally 1.2 m cover and finally hydro tested to 1.5 times design pressure. The underground steel network is protected against corrosion by coating the pipes and applying impressed current Cathodic protection. Special care is taken during installation, operation and maintenance for rail, road and nala, canal crossings. The scope of primary starts after City Gate Station (CGS) and spreads across the city or local distribution zone (LDZ) up to inlet of CPRS, DRS, DPRC and CNG Station and it operates at pressure range from 7 to 49 bars (MOP as per actual demand and pipe

specification). Major industrial consumers and CNG mother stations are as directly fed through connection in Primary network.

1.6.4 Secondary Network

Operating pressure fluctuating between 0.5 barg and 4.6 barg based on the minimum pressure (Pmin) necessary at the inlet of End-Users / guaranteed MGP to end-users.

Large and Small Commercial consumers will be fed through connections in Secondary network.

1.6.5 Low Pressure Network (Pressure below 0.110 bar g/ 110mbar g) / Tertiary Network

LP network caters gas from central DRS stations to individual commercial or domestic consumers. The design presented relies on a low pressure network operated at 5 barg until the ultimate customers whether commercial or individual.

However, in a context of low individual consumption of most of the users (small individual users for domestic consumption only), the use of simpler pressure reducing system in the 21 mbarg at end-user connection is provided. For both steel & PE network, looping of network is used, wherever possible in order to optimise pipeline size & provide uninterrupted supply in the event of major line damage.

1.7 CITY GAS DISTRIBUTION SYSTEM COMPONENTS

1.7.1 CITY GATE STATION

“City Gate Station” means the point where the custody transfer of natural gas from natural gas transporter to the CGD network takes place.

CGS generally comprises of Filters, Pressure Regulating & control devices, metering & Odorization system, Pressure Gauges, Heating system (if any), Canopy (may or may not be) & other allied accessories. A control panel with instrumentations is also provided / installed for data acquisition, back-up & monitoring purpose.

1.7.2 DISTRIBUTION MAINS & SERVICES

Medium density grade PE 100/PE 80 polyethylene (PE) pipelines in various sizes from 63 to 160 mm OD has been laid for all distribution mains with all jointing by the electro fusion process for mains & services as well. As built network drawings will be provided post award of **CONTRACT**.

Distribution services running from the PE mains to the customers appliance(s) are constructed of polyethylene for their underground section (from main to a PE / GI transition fitting, situated adjacent to the outside of the customers premises), and then installed galvanised iron (GI) pipe thereafter. The size of services pipes is standardised to 90, 63, 32 and 20 mm. As built network drawings will be provided post award of **CONTRACT**.

1.7.3 District Regulating Station (DRS)

DRS consists of filtration system, regulator system & metering system (optional). Generally DRS is designed & supplied as a single compact (twin stream) skid. For flow range 500 to 10000 SCMH pilot operated are generally used. DRS reduces the gas pressure from 7 – 49 barg to 1 - 5 bar g and also works as gas measuring facility if required.

1.7.4 INDUSTRIAL METERING SKID (IMS)

IMS consists of filtration system, regulator system (if required) & metering system. Generally IMS is designed & supplied as a single compact skid. All piping is rigidly supported and adequate pipe supports are provided for the filters, meters & regulators. These are bolted to the skid structure, designed and located with due regards to weight distribution and operational pipe stress.

1.7.5 SERVICE REGULATOR (SR)

Service Regulator is a pressure regulating station that interfaces a MP network with a LP network. Presently Service Regulator are fitted in CGD system of **GEL** having capacity varies from 10 m³/hr to 200 m³/hr. Service Regulator are continuous operating type for natural gas regulating system. It regulates / reduces inlet pressure of 0.5 bar g to 5 bar g at to 0.11 bar g. This skid is having single stream pressure control valves for over pressure safety shut off, under pressure safety shut off & pressure relief valves at the outlet of the Service Regulators.

1.7.6 NETWORK ISOLATION VALVE (SV)

In the operation of a steel pipeline network distribution system gas flow can be stopped through the use of valves, plugging devices in an emergency situation with a manual device to form a seal, where it is imperative the flow be stopped and where it cannot be achieved in another manner. Ball valves are provided / installed as per PNGRB Guidelines and also looking to the parameters such as population density, critical locations, etc...The sizes of such valves varies from 4 to 12 inch diameter. As built network drawings will be provided post award of **CONTRACT**.

Necessary valve pits / chambers are constructed to protect / safe guard the isolation valve, which is made of RCC Precast chamber/Masonry work with Slippers.

1.8 CATHODIC PROTECTION

Cathodic protection is a method of inhibiting corrosion to steel pipes. The technique is to connect the pipe line to anode bed and to make the pipe behave as cathode by impressing a direct current voltage so that the anode bed corrodes and not the pipe. Cathodic protection is particularly important for coated pipes to overcome the effect of pinholes or accidental breaks in the coating which would permit local corrosion cells to form which are highly active and can rapidly penetrates the pipe line.

Cathodic protection system consists of –

- Impressed current system: Impressed current systems are generally installed where alternating current is available for the rectifier unit.
- Permanent (direct) current system: Permanent Cathodic systems are generally installed where alternating current is not available for standard rectifier units. For this system direct current is provided by a transformer-rectifier combination.
- The existing cathodic protection is utilised for the protection of carbon steel pipeline from corrosion.

1.9 ODORANT SYSTEM & STORAGE / ODORANT HANDLING MANAGEMENT

The natural gas is odorless and Colour less. The natural gas supplied to customers through, the City Gas Distribution System is odorized for facilitating the early detection of gas, when it leaks, before it causes hazards like fire / explosion and asphyxiation. Adequate odor / smell is imparted to piped natural gas by continuously dosing controlled quantity of odorant chemical, in the flowing gas supply.

Generally, Ethyl Mercaptan chemical is used as odorant. The dosing is such that it is safe for human as well as materials and equipment used in CGD system. The adequacy of Sulphur content in dosing can be periodically verified by Dragger tube test or other odorant detection instrument at the remote active consumption points.

Similarly, the adequacy of smell of odorant in gas supply has been regularly checked by equipment / standard nose method, by trained and competent persons by smelling gas at various points in the network, by carrying out special smell survey or during attending customer complaints, and declaring / deciding and recording the sufficiency of odorant smell in the gas at a particular dosing rate.

The Ethyl Mercaptan, being noxious smell nuisance producing chemical, the Pollution Control Board, local authorities and public in general, are very sensitive, for various odorant related activities like, Import, Transportation, Storage, Dosing and Waste disposal of the empty odorant barrel. Hence to meet the statutory requirements and to eliminate / handle the related problems, it requires a comprehensive odorant handling management. Especially the activities which comes in our purview like, Storage, Local / internal transport, Dosing and Waste Disposal.

A typical odorant facility will comprise of a gas metering device, storage tank, metering pumps (duty and standby) and control system to achieve the desired concentration of odorant in natural gas. The pumps are often powered by natural gas, which is exhausted to atmosphere via a carbon canister.

In this odoriser, a very small amount of mainstream natural gas is by-passed through the odorizing unit. In its journey through the odorizing unit, the by-pass gas absorbs enough odorant to provide the desired odour intensity for the entire gas stream. Subsequently the resulting odorant laden gas is returned to the mainstream.

Bulk storage facility for gas Odorant, as per the norms & optimum resources available, includes, Hazardous Chemical & waste storage separately, PPEs', RCC rooms, Lifting tackles, Security fencing, Pneumatic Transfer pump, collection arrangement, etc.

2. SCOPE

The scope of this tender document is to set down the minimum day to day operational and maintenance requirements for City Gas Distribution Network. The adoption of prudent operation and maintenance practices shall facilitate delivery of a safe and secure gas supply to end users.

City Gas Distribution Network is limited to downstream of primary network consisting of steel pipeline commissioned from City Gate Station, DRS, PE 100/80 polyethylene pipe line network, associated facilities like Service Regulators and industrial, commercial and domestic consumers installations.

Operating conditions given herein are indicative and may be rectified during actual operation depending on site conditions, experience gained during commissioning, operation and system requirements / design conditions for detailed O & M instruction for equipment, vendor's / manufacturer manuals for respective equipment should be required in the event of any discrepancy between this tender document specifications and the vendor's / manufacturer's recommendations the latter shall take precedence.

Scope of this document can be broadly classified in followings parts

PART – 1

Scheduled activities like LPT / LDT, Painting, Mechanical fabrication, Valve Greasing, thickness testing, Civil works, etc., as per **GEL AOMP** as well as shifting / modification of existing steel pipeline / laying of steel pipeline of not more than 500 meters either as an extension of existing U/G and A/G pipeline or for Hookup / replacement of valves, IJs, skids etc., Temporary Cathodic Protection, HDD activities or any other activities planned as per the instructions from **GEL EIC**. Job includes all the associated activities required like excavation, dewatering, cleaning of pit, back filling, testing, pre-commissioning & commissioning and final cleanup to restore the field to its original conditions. Transportation, loading & unloading of materials to site shall be in the scope of **CONTRACTOR**. The cost of the same shall be borne by **CONTRACTOR**.

Job shall be carried out as per **GEL Guidelines / Procedure**, PNGRB T4S, ASME B 31.8/ API 1104 or any other relevant regulation / standard. This also includes the supply of equipment's, machinery, resource and manpower required for taking up the repair/maintenance of network & allied facilities including extension work etc. Prior approval from **GEL EIC** is mandatory before executing the job.

Major services to be executed by the **CONTRACTOR** but not limited to the list given below are:

- Various scheduled / planned survey, inspection & maintenance activities on Underground steel pipeline and associated facilities.
- Various scheduled / planned survey, inspection & maintenance activities on Above ground piping system and associated facilities.
- Steel pipeline laying, testing, purging and commissioning (Modification, up gradation of already laid and commissioned network and hook up to equipment's upto a length of 500 meters) as per the scope given in Annexure-1 (Detailed Scope of Work For Pipeline Laying).
- Underground installation of valves and construction of valve chambers
- Maintenance of underground-aboveground valves and underground chambers

- Painting of steel pipelines and other assets like DRS / DPRS/CPRS / IPRS / IMS / SR / Valves / Valve chambers.
- Fabrication of canopy of DRS / DPRS / CPRS / IMS / IPRS / SR etc., Fabrication of fencing, Pipe supports, Crossovers, Ladders / structures needed for platforms etc.
- Minor Civil works like construction of equipment foundations, Valve chambers, civil supports, fencing above the boundary walls etc. that does not need major mobilization.
- Fabrication, painting Supply and installation of marker, sleepers on the pipeline route and valve chambers.
- Pipeline laying through horizontal directional drilling (HDD) method and backfilling.
- Crossings by horizontal directional drilling (HDD)/ Thrust boring including cased crossing.
- Installation of DRS/CPRS/IPRS DPRS/IMS/SR/ modules.
- Installation of Valves on underground Pipeline and above ground piping as per **GEL** Requirement.
- Fabrication, installation, testing and purging of associated piping work for hook up with equipment as per the advice of EIC.
- Fabrication of valve assembly and testing of the same.
- Hook up with End connection in the existing network.
- Thickness & health checkup of station piping, Pressure vessels including filters, knock out drums etc.
- Emergency response and management.
- Obtain Work Completion Certificate (WCC), No objection certificate (NOC) from the concern authority after satisfactory work completion..
- Replacement, supply and Installation of Hot dip Zinc Galvanized Studs & Bolts, Gasket, and Consumables etc. as per **GEL EIC** instructions in line with applicable regulations.

PART – 2

Repair / Rectifications of steel pipeline network and associated facilities including planned / breakdown maintenance, attending to any emergency.

All the associated activities required on steel pipeline network like LPT & LDT, excavation to locate the point of damage / point of leakage, dewatering, cleaning of excavated site, barricading, making the site ready for attending the damage / leakage as per the **GEL** issued standard procedure / **GEL** approved procedure, execution of job, back filling and final cleanup to restore the site to its original condition.

Transportation, loading & unloading of material to site shall be in the scope of **CONTRACTOR**. Job shall be carried out as per ASME B 31.8/ API 1104/PNGRB (T4S) or any other relevant regulation / standard. This also includes the equipments, resource and manpower required for taking up the repair of network etc., Prior approval from **GEL EIC** is mandatory before executing the job.

Typical list of repairs / modification activities that are to be considered under the scope of the **CONTRACTOR** are:

- Damages / Leakages in underground steel pipeline and associated facilities

- Damage / Leakages in above ground piping system – Station piping and associated facilities at CGS / CNG / DRS / DPRC / CPRS stations.
- Installation of leak clamps with Teflon sheet (3 to 5 mm) of suitable size on pipes of dia. 2"/4"/6"/ 8" / 10"/12" and up to 24",
- Repair of damaged portion of pipeline by installation of pre-hydro tested spool pieces, welding, joint NDT and FBE / 3LPE coating testing as per **GEL** approved procedure.
- Repair of damaged concrete coating
- Repair of valve chambers, equipment foundations and construction of collapsed boundary wall etc. that needs immediate attention for ensuring safe operation of equipment and security of installation.
- Attending foam/bubble type or minor leakage on steel pipeline network without requirement of shutdown.
- Non-AOMP works / activities other than AOMP related to O&M of the steel pipeline network and associated facilities like CGS, CPRS, Valves, TPL, route markers, grass cutting & approach road cleaning, valve markers, removal and installation of blind, leak test, pre-& post festival preparedness, locating and monitoring of steel pipeline network etc. at no additional cost to **GEL**.

This document summarizes the technical requirements and specifications for work required to be executed as per the scope mentioned and minor modification if required as per the company requirements and direction of EIC.

The Pipeline and piping will be of ANSI 150, 300 & 600 Pressure Class. The Pipeline used shall be API 5L, PSL-2 Carbon Steel Pipe of various diameters up to 24" and different Grades such as Grade B, X 42, X52, X60, X65. The piping used shall be ASTM A106 Grade B and ASTM A333 Gr.6 with matching fittings of various schedules as per pressure class.

2.1 DEFINITIONS

In the Bid / **CONTRACT** (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires.

1. **"GEL" or "OWNER" or "BUYER" or "GUJARAT ENERGY"** shall mean Gujarat Energy Limited (GEL), having its Registered Office at Gujarat Energy Bhavan, Behind Udyog Bhavan, Sector- 11, Gandhinagar, Gujarat – 382010.
2. The **"Bid"** shall mean the Bid submitted by the **CONTRACTOR** for acceptance by GUJARAT ENERGY LTD.
3. The **"GUJARAT ENERGY's Representative"** shall mean the person designated as such by the GUJARAT ENERGY Limited and shall include his authorized nominee or agent, provided however that the GUJARAT ENERGY's representative to be so designated by GUJARAT ENERGY may be one person for certain aspects of this agreement and another person for other aspects of work covered by this Bid / **CONTRACT**.
4. **"Engineer / Engineer-in- Charge" (EIC)** shall mean the person designated from time to time by the **GEL** and shall include those who are expressly authorized by him to act for and on his behalf for operation of this **CONTRACT**.
5. The **"Contract"** shall mean the agreement between the GUJARAT ENERGY and the **CONTRACTOR** for the execution of the works including therein all contract documentation.

6. The “**Service Provider**” or “**Bidder**” or “**CONTRACTOR**” shall mean the person or persons, firm or Company whose Bid has been accepted by GUJARAT ENERGY and including the **CONTRACTOR**'s legal representatives, his successors and permitted assigns.
7. “**Third Party Agency**” (TPA) shall mean Third party inspection agency other than GUJARAT ENERGY, but authorized by the Company.
8. “**Vendor**” shall mean the person or persons, firm or company or Manufacturer on whom GUJARAT ENERGY has placed agreement for supplying the Material at GUJARAT ENERGY designated store or Site through the transporter with required documents.
9. “**Stores**” shall mean the Company Stores located across Gujarat
10. “**Storage point**” will be a location closer to the work site selected for storing of various materials required for job execution. Space and location shall be jointly decided by COMPANY and **CONTRACTOR** based on convenience to expedite the site work.
11. “**Site**” shall mean the location in which Permanent Works are to be carried out for the purpose of contract.
12. The “**Permanent Works**” or “**Works**” shall mean and include all works to be executed in accordance with the **CONTRACT** or part thereof as the case may be and shall include all extras, additional, altered or substituted works as required for the purpose of **CONTRACT**.
13. “**Temporary Works**” shall mean all temporary works of every kind required in or about the execution, completion or maintenance of the works, which are not permanent.
14. The “**Specification**” shall mean various technical specifications, provisions attached and referred to in the Bid documents which pertain to the method and manner of performing the work or works to the quantities and qualities of the work or works and the materials to be furnished under the **CONTRACT** or works or works as may be amplified or modified by the **COMPANY** during the performance of **CONTRACT** in order to provide the unforeseen conditions or in the best interests of the work or works. It shall also include the latest edition of relevant standard specifications including all addenda / corrigenda published before entering into the **CONTRACT**.
15. “**Approved**” shall mean approved in writing including subsequent written confirmation of previous verbal approval and ‘Approval’ means approved in writing including as aforesaid.
16. The “**Drawings**” shall include maps, plans, tracings, prints & sketches thereof with any modifications approved in writing by the **GEL** authorized representative or Engineer – In-charge and such other drawing as may be issued from time to time, be furnished or approved in writing by the Engineer – In-charge.
17. “**Construction Equipment**” means all appliances / equipment and things of whatsoever nature for the use in or for the execution, operation, or maintenance of the work or temporary works but does not include materials or other things intended to form or to be incorporated into the WORK, or camping facilities.
18. “**Mobilization**” shall mean establishment of sufficiently adequate infrastructure by the **CONTRACTOR** at site comprising of construction equipment, aids, tools tackles including setting of site offices / Site Camp with facilities such as power, water, communication etc., establishing manpower organization comprising of resident engineer, supervising personnel and an adequate strength of skilled, semi-skilled and unskilled workers, who with the so established infrastructure shall be in a position to

commence execution of work at site (s). MOBILIZATION shall be considered to have been achieved, if the **CONTRACTOR** is able to establish infrastructure as indicated above to commence work at all site (s)/ locations as per time schedule, where so warranted in accordance with agreed schedule of work implementation to the satisfaction of COMPANY / engineer – in-charge.

19. **“Working Day”** means any day, which is not declared to be holiday or rest day by **COMPANY**.
20. **“Mechanical Completion”** means completion of the project including return / transportation of remaining free issued material from GUJARAT ENERGY designated store, Clearing and Grading of the agricultural / Govt. land for making ROW, Trenching, stringing & Welding, Destructive and Non Destructive testing, Field joint Coating, Lowering, Crossing of others Under Ground Utilities, Padding, Backfilling & Compacting, Final Clean-up etc. of all facilities including pipeline work to the satisfaction of the EIC which may be included in scope of the work specification .
21. **“Commissioning”** shall means pressing into service of the constructed facilities including the plant(s), equipment(s), vessel(s), pipeline, machinery (ies), or any other section or sub-section of installation(s) pertaining to the work of the **CONTRACTOR** after successful testing and trial runs of the same.
22. **“Guarantee”** means the period and other conditions governing the warranty / guarantee in respect of the work as detailed in section hereunder.
23. **“CP”** means Cathodic Protection system designed and installed for corrosion control of Steel Pipelines.
24. **“TCP”** means Temporary Cathodic Protection system designed and installed for corrosion control of Steel Pipelines during construction & **“PCP”** means Permanent Cathodic Protection system designed and installed for corrosion control of Steel Pipelines after completion of construction activity.
25. **“HSE”** means Health, Safety, & Environment.
26. **“EMERGENCY”** means any incident / fire / explosion / gas leakage on the Transmission or Distribution Steel Network including installations.
27. **“Instance”** means occurrence of non-compliance per site per day.
28. **“AOMP”** means Annual operation maintenance plan.
29. **“SOP”** means standard operating procedure.
30. **“SOR”** means Schedule of Rate.

2.2 REFERENCE CODE AND STANDARD

Following standards and codes of latest edition have been used in this specification.

Governing Standards

ASME B 31.8	Gas Transmissions and Distribution Piping Systems
PNGRB Guideline	Technical standard specification including safety standards (T4S) for Natural Gas Pipeline & CGD
ISO – 14001: 2004	Environmental Management System
ISO – 18001: 2007	Occupational Health & Safety Management System

Reference Standards

API 1104	Standard for Welding Pipelines and Related Facilities
ASME SEC.IX	Boiler and Pressure Vessel code Welding & Brazing Qualification
API 1109	Specification for Pipeline Marker
API RP1102	Steel pipeline Crossing Rail Roads & Highways
IGE/SR/18 Part 1	Safe Working in the vicinity of Gas Pipelines, Mains & Associated Installations operating at pressure in excess of 2 bar
IGE/TD/01	Steel Pipeline for High Pressure Gas Transmission
IGE/TD/03	Distribution Mains
IGE/TD/06	Transport, Handling and Storage of Steel Pipe, Valves & Fittings
OISD 141	Design & Construction requirement for cross-country hydrocarbon pipeline
PFI ES – 24	Recommended Practice for Shop Fabricated Pipeline
SIS – 055900	Pictorial surface preparation standard for painting steel surfaces
SSPC – SP1	Steel structure painting council.
HSE EXHIBIT (HSE)	CONTRACTOR Own Health, Safety, Security and Environment

Management System, its HSE policy and its HSE Plan are compatible with **GEL** HSE policy, objectives and HSE Management System.

In case of conflict between the requirement of this specification and that of above referred codes, standards and specifications, the requirements of this specification shall govern.

Modification and up gradation of steel network involves laying of steel pipeline underground and piping system & associated facilities installation above ground. Hence for the modification and up gradation, **CONTRACTOR** to refer Scope of work (technical scope of work only) for laying, testing, and commissioning of CGD- Steel pipeline network (Document No.: **GEL/TS/STEEL/SERVICE/STEEL LAYING UPTO 5 KM/SOW**) as applicable.

3. GENERAL TERMS & CONDITIONS OF CONTRACT

3.1 GENERAL SCOPE

- This specification shall be read in conjunction with the conditions of all specifications included in the BID.
- **CONTRACTOR** shall, with due care and diligence, execute the work in compliance with all laws, by-laws, ordinances, regulations, etc. and provide all services and labor inclusive of supervision thereof. All materials, equipments, appliances, or other things (other than issued by **GEL**) of whatsoever nature required in or about the execution of the work, whether of a temporary or permanent nature shall be provided by the **CONTRACTOR**.
- **CONTRACTOR** shall take full responsibility for the stability and HSE of all operations and methods involved in the work.
- **CONTRACTOR** shall be deemed to have inspected and examined the work area and its surroundings and to have satisfied himself so far as practicable as to the form and nature thereof, including subsurface conditions, the extent and nature of work and materials necessary for the completion of the work and the means of access to the work area.
- During the execution of work, **CONTRACTOR** should ensure that it should not obstruct any or all other activities performed by other agencies.
- **CONTRACTOR** shall be deemed to have obtained all necessary information on subject as above mentioned as to risks, contingencies and all other circumstances, which may influence the work.
- **CONTRACTOR** shall, in connection with the work, provide and maintain at his own cost, all lights, guards, fencing, watch & ward etc. when and where necessary or required by **GEL** or by any duly Constituted Authority for the protection of the work and properties for the safety and convenience of the public and / or others.
- Unless otherwise specified, all sections of this specification shall apply to all the specification referred in this **CONTRACT**.
- **CONTRACTOR** shall procure and supply all the materials other than **GEL** supplied materials, required for permanent installation of main pipeline and terminals in sequence and at appropriate time. All equipment, materials, components etc. shall be suitable for the intended service. Vendor has to take prior approval from **GEL** in the form WO / LOI / PO for providing any Materials / Services not covered under the SOR attached herewith in this document.
- **CONTRACTOR** shall supply equipment, appliances or other tools & Tackles along with consumables of whatsoever nature required in or about the execution of the work, whether of temporary or permanent nature

3.2 CONTRACTOR'S SCOPE OF WORK

- The work referred in this bid is for scheduled maintenance, repair and emergency handling of steel distribution network. The work sites will be at locations operated by **GEL** across Gujarat, Maharashtra, Rajasthan, Madhya Pradesh, Punjab & Haryana. The work will also be covering the activity of maintenance of the pipe line and emergency work on steel pipe line network. It also covers the execution of shut down jobs after taking the network out of service using the inert gas purging and replacing the pipe sections or taking the tap offs. The work will also cover the activity

of providing support services if needed for the Hot tap jobs required to perform for taking the tap offs or stopping the supply. This work will also involve laying, testing and commissioning of new pipeline section.

- The work requires a special skill and attention as majority work will be on live gas network. The **CONTRACTOR** is required to understand the full scope of work detailed in the bid. The **CONTRACTOR** is also required to keep sufficient equipments, skilled manpower to act on an emergency work called as a part of maintenance.
- **CONTRACTOR** shall be prepared to work simultaneously in number of spreads as per the mutually accepted schedule with different crews for the activity of construction and maintenance to expedite the work for timely completion, without any additional cost to **GEL**.

3.2.1 TECHNICAL SCOPE

All the activities required for Steel Pipeline Laying, Installation and commissioning of Steel Pipeline including station Piping, Maintenance as per AOMP / mutually agreed schedule / plan, Repair / rectification, Steel network Shutdown / Break down and any other emergencies.

Part-A: - For Steel Pipeline Repair

The following is a broad description of activities, which shall be included as part of this **CONTRACT** for **Steel Pipeline repair due to damage/leakage**. Job shall be carried out as per ASME B 31.8/ API 1104/PNGRB (T4S).

GEL carries out periodic leak surveys of its pipe line as per the Annual operating and maintenance plan (AOMP). Team mobilized by the **CONTRACTOR** shall have the required expertise to execute the job and analyses the collected data for ensuring that the pipeline surveys are effective for determining if any potentially hazardous leakage exists. For any leakage/damage exist on pipeline temporary/permanent measures shall be taken immediately to protect public and environment.

i. Steel pipeline repair with use of leak clamps

Repair of existing buried pipeline by using GEL supplied leak repair clamps & other accessories related to clamp.

- Liaisoning with local authorities and with co-ordination with authorities as well as third party utility companies to carry out the required job.
- Excavation of pit to locate the leakage, dewatering, cleaning of pit, clearing the pipe surface to put clamping after doing proper isolation as advised by **GEL EIC**.
- Installation of clamp with Teflon sheet (3 to 5mm) of suitable size to complete the job as per direction of EIC. on pipes of dia. 2"/4"/6"/8"/10"/12" up to 24".
- Repair of damaged coating, testing as per **GEL** approved procedure and installation of clamps, back filling and final cleanup to restore the field to its original conditions. However, clamp portion should be buried after applying R95 Liquid Epoxy Coating for ensuring non-exposure of clamped portion.
- Transportation, loading & unloading of clamp and other material to site shall be in the scope of **CONTRACTOR**.
- Job shall be carried out as per ASME B 31.8/ API 1104/PNGRB (T4S).

- Leak clamps fitted can be removed and deposit to **GEL** by the **CONTRACTOR** subsequent to completion of repair job.

Repair of existing above ground pipeline by using GEL supplied leak repair clamps & other accessories related to clamp.

- Clearing the pipe surface to put clamping.
- Installation of clamp to complete the job as per direction of **GEL** EIC. on pipes of dia. 2"/4"/6"/ 8" /10"/ 12" / 18" up to 24".
- Repair of damaged coating/painting.
- Transportation, loading & unloading of clamp and other material to site shall be in the scope of **CONTRACTOR**.
- Job shall be carried out as per ASME B 31.8/ API 1104/PNGRB (T4S).
- Leak clamps fitted can be removed and deposit to **GEL** by the **CONTRACTOR** subsequent to completion of repair job.

ii. Steel pipeline repair by replacing damaged portion and network modification required in steel distribution network

- Issue & receipt of line pipe and other free issue Materials from **GEL** designated store or on site delivered directly from vendor as the case may be.
- Supply of all fasteners, gaskets & consumables procured from approved vendor of **GEL** is under scope of **CONTRACTOR**.
- Storage, Handling and Transportation of Pipes, Fittings, other project job related material and equipment
- Survey for utility identification
- ROW Clearing & Grading
- Welding and NDT of welded Line Pipes joints
- Trenching, dewatering, cleaning of pit or trench
- Surface & bevel preparation, DP checking, Welding, NDT, Field Joint Coating, Holiday inspection of repaired portion and exposed pipeline
- Crossings including cased crossing through HDD or thrust boring.
- Pre-hydrotesting of section,
- Lowering and backfilling.
- Shoring, shuttering arrangement to be provided for preventing trench collapse as per the direction of **GEL** Engineer In charge.
- Hydro test, Cleaning, Pneumatic testing, Swabbing, Pre-commissioning.
- Supply of N2 Cylinders or cascades for purging of pipeline/piping.
- Isolation of pipeline section. Cleaning of isolation valve chamber and Greasing of isolation valves
- Venting of Gas from pipeline. Purging of pipeline with N2.
- Cutting of damage portion and welding of new pipe with existing pipeline.

- Clearance for commissioning after reviewing records of all activities executed for Mechanical completion.
- Installation of various markers like route marker, warning markers and Kilometer markers
- Commissioning of Pipeline.
- Restoration of the site as per the satisfaction of EIC or concerned authorities.

ADDITIONAL ACTIVITIES under Scope of CONTRACTOR

- Cold Field Bending of Pipes.
- Concrete Coating of Pipes.
- Installation of Valves, Insulation Joints and other Special installation in the Pipeline.
- Transportation, shifting, Fabrication and Installation and Hook up of DRS/CPRS.
- HOT Tap Assistance (including site preparation, deployment of Manpower and equipment support required if needed).
- Fabrication and structural Works, Civil work for construction of valve chambers and foundation for facilities like DRS/CPRS, DG etc.
- Dismantling of various commissioned facilities like CGS skid, Filters, Valves, IPRS/CPRS/IMS, pipeline and piping section.
- Shut off of network, cutting and beveling of section to be repaired or modified.
- **Holiday inspection of repaired portion and exposed pipeline**
 - The holiday detector used shall be checked and calibrated daily with an accurate or calibrated DC voltmeter.
 - The full circle holiday detector shall be approved by **GEL/TPIA**. The test voltage shall be 5 kV + 5 kV/mm of total thickness, subject to a maximum of 25 kV. Inspection of the sleeves shall be conducted only after the joint has cooled below 50 °C (applicable for heat shrink wraparounds).
 - No field joint coatings shall be covered or lowered in the trench until it has been approved by the **GEL/TPIA**.

Note: Rate as applicable will be paid for jobs specified in additional SOR as and when those jobs were executed by the **CONTRACTOR**.

Part-B: - For Steel Pipeline and facilities maintenance including up gradation, modification

All the activities required for **Steel Pipeline, Maintenance and Installation of Steel Pipeline including above ground/ underground installations (CGS/skid/DRS/CPRS etc.) including Plant Piping, Repair and Network Shutdown** as per the Plan, including, but not limited to, the following. Scope of work for Steel pipe line laying, Testing and commissioning shall be as per Annexure-1.

- Issue & receipt of free issue Materials from **GEL** designated store or on-site delivery directly from vendor as the case may be. Supply of all required fasteners, gaskets, consumables etc. procured from approved vendor of **GEL**

is under scope of **CONTRACTOR** as per the rates mentioned in this tender or rates derived and mutually accepted from other works of similar nature.

- Liasioning with local authorities and with co-ordination with authorities as well as third party utility companies to carry out the required job.
- Storage, Handling and Transportation of Pipes, Fittings, other project job related material and equipment
- ROW Clearing & Grading.
- Identification of underground utilities using locating instruments.
- Trail pits excavation for utility identification.
- Trenching.
- Shoring, shuttering arrangement to be provided for preventing trench collapse as per the direction of **GEL** Engineer In charge.
- Cutting, beveling of line pipe.
- Welding and NDT of A/G & U/G Line Pipes joints.
- Field Joint Coating, Holiday inspection of repaired portion and exposed pipeline
- Concrete Coating of Pipes if required.
- Cold Field Bending
- Crossings including cased crossing through HDD or thrust boring.
- Pre-hydrostatic testing as per the requirements of **GEL** procedure.
- Lowering of pipeline section and backfilling.
- Hydro test, Cleaning, Drying, Pneumatic testing, Swabbing and Pre-Commissioning Hook up of Pipelines.
- Shut off of network.
- Supply of nitrogen cylinders and purging of network and other facilities as per the direction of EIC.
- Commissioning of Pipeline.
- Transportation, shifting, Fabrication and Installation of DRS/CPRS/ DPRS / IPRS / MRS
- Installation of Valves, Insulation Joints and other Special Installation in the Pipeline
- HOT Tap Assistance if needed.
- Fabrication and Installation of Steel structures such as Supports, Cross Over, ladders etc. as per site requirement including civil works.
- Fabrication of all types of welding joints of piping system shall be as per technical specification attached as Annexure-2(a) of this document.
- Fabrication and erection of above ground and trench piping systems shall be as per procedure attached as Annexure-2(b) along with this document.
- Civil work for construction of valve chambers and foundations for DPRC etc.

- Dismantling of CGS skid, Filters/ vessels- dismantling, cleaning, hydro testing and transportation to **GEL** designated store or location as directed by **GEL**.
- Painting as and when required as per **GEL** issued specifications on the steel piping, valves and other facilities as per AOMP.
- Repairing of damaged pipeline coating after surface preparation and holiday test to check the continuity of coating.
- Restoration of the site as per the satisfaction of EIC or concerned authorities.
- Thickness test of various facilities as per the Procedure attached as Annexure-3 along with this document
- Peel off test for health checkup of existing system.
- Painting of pipe, TLP's, Vent pipes, Panels, Gate, Door, Window etc. continuous smooth surface (including scraping, primer & 2 coat approved paint).
- Hydro testing of filters/KOD and other pressure vessels.
- Extension of casing pipe and associated activities.
- Installation of small sections of pipe, valves, fittings for repair/ modification/ up gradation of existing network.

Part-C: - For Valve / Valve chamber installation and maintenance

- Issue & receipt of free issue Materials from **GEL** designated store or on site delivered directly from vendor as the case may be.
- Breaking of Old civil valve chamber for shifting of valve assembly.
- Civil construction of new valve chamber as per specification provided by **GEL**.
- Civil repair of valve chamber/ sleeper.
- Maintenance of Valves, gear box and other associated facilities, greasing and sealant injection etc.
 - ❖ Leak test of joints, fasteners, gasket by Gas Detector as well as soap solution
 - ❖ Greasing and purging (for valves installed on steel pipeline network)
 - ❖ Check for ease of operation of valves
 - ❖ Painting and coating of valve, pipe section & sleepers
- Maintenance and repairing of Valves chamber, housekeeping of valve chamber, painting and stenciling of valve chamber etc.,
 - ❖ Cleaning, De-watering and General Housekeeping of Valve chamber
 - ❖ White washing of valve chamber
 - ❖ Numbering (tagging) of valve chambers
- Operational check including LPT of valves.
- Painting of valves as and when required Painting of grating, Jali/net, valve cage etc of non-continuous surface (including scraping, primer & 2 coats approved paint).

- Installation/Replacement of valves

CONTRACTOR to refer attached separate Annexure for “Installation of Valves & Valve Chambers” and for “Methodology for carrying out Valve & Valve Chamber Maintenance” respectively.

Part-D: - For Civil work Steel Pipeline and facilities maintenance

- Supply and Installation of various markers including New Pipeline KM post, warning, aerial and direction marker, boundary pillar.
- Backfilling of any exposed portion of pipeline and installation of mechanical protection above pipeline.
- Any restoration/rectification or replacement of pipeline assets in ROU like KM post, Pipeline markers, boundary pillar, aerial marker, TLP etc. is the part of scope of work
- Civil work for repair of Pavement and blocks
- Restoration of site to the satisfaction of **GEL** in case of removal of any pedestal or any RCC pavement or blocks while laying of steel pipeline.
- RCC, PCC and brick work for foundation of various installation and other piping support and foundation related civil works.
- Supply and installation of RCC Hume pipe for restoring storm water drain
Supply and spreading quarry spoil
- Civil construction & allied works shall be as per procedure attached as Annexure-6 along with this document.
- Plastering and painting of walls.
- Repairing of steel valve chamber, earthing pit and any other civil works as directed by EIC.

Part-E: - Other activities

- Calibration of SRV/CRV of various sizes as per procedure attached as Annexure-4 along with this document.
- Calibration/testing of Instruments and control devices as per the procedure mentioned in Annexure-5 of this document.
- Arrangement and mobilization of fire tender unit along with competent manpower as per SOR.
- Painting of numbers/ letters/ logos/arrows as per the applicable color coding on installations and markers.
- Collection of hazardous waste as per SOR.
- Transportation of diesel in MS barrel from approved Petrol pump retail outlet to **GEL**'s location as directed by EIC for fueling the DG sets. The job includes loading of filled drums in vehicle, transportation abiding all safety precautions and unloading at designated places.
- Upkeep and collate as built drawings in compiled AutoCAD drawing as well as correction / updating of references or details in existing drawings as instructed by **GEL EIC**. This also includes preparation of as built drawings of

laid pipeline-station piping by collecting required details from site as instructed by **GEL EIC**.

- **CONTRACTOR** shall attend Weekly / Monthly review meetings and all other meetings called by **GEL** and submit monthly summary & performance review to **GEL**.

3.2.2 HSE MANAGEMENT

- Implementation of HSE policy, HSE Management System, Life Saver and guideline during execution of **CONTRACT**.
- Procure PPE's as per the **GEL** approved specifications.
- Preparation and approvals of HSE Plan.
- Provide Fabricated Caution Board and the Barricades as per the **GEL** approved design.
- Preparation of detailed risk register for Site Specific Risks along with Mitigation plan in Risk Register and submit copy to **GEL**.
- Conduct site specific risk assessment with mitigation plan and submit copy of relevant documents to **GEL**. Entire mitigation plan shall be reviewed and approved by **GEL/TPIA**.
- Site specific risk and Mitigation plan as per the recommendations shall be recorded in Risk register.
- Preparation and approvals of work execution Plan as per time line agreed in penalty matrix and SLA's while bidding.
- Preparation and approval of resource deployment plan to complete the work in time.
- Preparation and approval of HSE permit as per the **GEL** PTW Matrix – Safe Working Practice.
- Conduct Tool Box talks with all involved man power at each location for each activity and maintain record.
- Transportation of all the Manpower including civil labour with in site in compliance to **GEL** Policy for Vehicles.
- Supply and Maintaining First Aid box including supply of all medicines as applicable.

3.2.3 MATERIALS MANAGEMENT

- The **CONTRACTOR** shall procure and provide within the VALUE OF **CONTRACT** all the materials that is required to carry out the construction activities including steels, cement and other building materials, tools, tackles, and other equipment for the completion and maintenance of the WORK except the materials which will be issued by the **GEL** and shall make his own arrangement for mobilizing such materials and transportation to the required worksites.
- The **CONTRACTOR** shall perform the necessary loading, unloading, hauling to points designated by the COMPANY and storing (if necessary) of the material furnished by **CONTRACTOR**. The **CONTRACTOR** shall exercise care in handling, hauling, storing and distribution of such materials in order to avoid damage or deterioration of these materials.

- **CONTRACTOR** to refer attached Annexure for “Mandatory requirement of Manpower, Machinery and tools-tackles” for O&M works for steel pipeline network & associated facilities.
- Material Reconciliation
- **CONTRACTOR** shall submit account of material issued for job to be completed.
- **CONTRACTOR** shall submit material consumption statement on Monthly basis or on completion of each job order as directed by **GEL** EIC.
- At the time of reconciliation after completing the assigned job, **CONTRACTOR** shall return balance material, equipments that are issued to him by **GEL** for execution of work at his own cost, in fresh condition after proper cleaning along with documents issued to them.
- **CONTRACTOR** shall return all the balance free issued material at **GEL** designated store along with the necessary documents. Any discrepancies, if found in material / instruments, equipment (issued by **GEL**) shortage / damage then cost of the same shall be deducted from **CONTRACTOR**'s running bill as per rate decided by **GEL**. (In case of pipes, short fall shall not be allowed for more than 0.5% of total pipes used).
- Material reconciliation shall be carried out once in a year (during July -August) if required by **GEL**.

3.2.4 **MANPOWER MANAGEMENT**

CONTRACTOR shall deploy Skilled/Unskilled manpower required for operation and maintenance activity. **CONTRACTOR** shall provide relevant training to the personnel deployed for the operation & maintenance of steel Network. The training will be exhaustive covering job skills needed for attending the assigned job and HSE management, especially onsite and off-site safety, emergency handling, disaster / risk management etc.

CONTRACTOR has to ensure the safety of Man and Machine all the times. The **CONTRACTOR** shall remain at all times liable to **GEL** for any loss or damage caused to any building plant, machine, installations of **GEL** / Consumers due to carelessness, negligence, inexperienced act of default of the **CONTRACTOR**, his agents, representative or employees. **GEL** shall be the sole judge as regards the quantum of loss or damage and shall be deducted from the amount of payable hereunder to the **CONTRACTOR** the cost of repairs or the amount of loss or damages.

CONTRACTOR shall provide administrative support including communication and transportation facilities to their staff for efficient functioning and reporting

CONTRACTOR shall not commence any work on any given day without intimating the **GEL** representative about the locations where the work is to be executed for that particular day. The decision of **GEL** representative on the priority of carrying out the Installation activity shall be final.

Subject to the provisions in the Bid Document and without prejudice to **CONTRACTOR**'s liabilities and responsibilities to provide adequate qualified and skilled personnel on the work, **CONTRACTOR** shall deploy site organization and augment the same as decided by the Engineer-in-charge depending on the exigencies of work.

CONTRACTOR shall deploy necessary and competent man power required as per site activities including but not limited to

- **Project Manager / Engineer** who will be responsible to interact with **EIC/TPIA** and authorized to attend review meetings, receive material, authorized to sign documents, claims and receive payments etc. **CONTRACTOR** shall employ a Project Manager / Coordinator on his company roll.

The Project Manager / Coordinator authorized by **CONTRACTOR** must have qualification of B.E. (Mech.) / Diploma in Mech. Engineer with min. one / three years of work experience respectively in gas Pipeline project. He shall be single point contact for all the works and must represent **CONTRACTOR** in the Review meetings.

- **Project / Project Planning Supervisor** who will be responsible for planning, execution, supervision of the project site activities and man power while maintaining a safe working environment ensuring compliance to applicable procedures and policies. The designated person must have diploma in mechanical engineering with min. 1 year of experience in relevant area.

The **CONTRACTOR** will deploy his own supervisors as directed by **site engineers/EIC**. These personnel will be reporting to the **EIC** for monitoring work standards and for ensuring that all technical requirements are met for the job being carried out. The **CONTRACTOR'S** supervisor(s) shall have day-today liaison with the **EIC**, and will provide the **EIC** with technical reports and audits, and other management information as is required on work progress and construction quality standards.

- **Material Quality Assurance Personal** who will be responsible and will look after quality and compliance of all material and consumables supplied by **CONTRACTOR** as per relevant standards and specifications. The designated person must have diploma in engineering with min. 1 year of experience in relevant area.
- **Quality inspector (Non-destructive testing)** who will be looking after quality aspect of various non-destructive testing required during project. The designated person must be certified for American Society for Non-Destructive Testing Level-II.
- **Safety officer** – Degree/diploma in engineering with min. 1 year of experience in relevant area or diploma in fire and safety/ industrial safety (Fresher or experienced).
- **Welder** – certification in line with API 1104 and/or Boiler and Pressure Vessel Sec IX.
- **Fitter** – ITI qualification and/or 3 years relevant experience.
- **Rigger** – At least 1-year relevant experience and capable to read Hindi / regional language of the area where deployed

- **Facilities (erection and commissioning)** – In addition to above following man power shall be deployed by **CONTRACTOR** in case of installation and commissioning of above ground and/or underground facilities including but not limited to City Gate Station, Odorant stations, Pressure Reduction Stations (PRS), Metering and Regulating stations (MRS)
- **Electrical** – ITI Electrical and certification from electrical inspector
- **Instrumentation** – ITI Instrumentation (Technician)
- **Metering** – ITI Instrumentation/ electronics (Technician)
- **Odorant Handling** – Diploma in Engineering (Mechanical/ chemical)
- All construction work will be carried out as per direction of **EIC**, and **EIC** will be the primary point of contact between the **CONTRACTOR** and **GEL** on site. All work will be issued and sanctioned through the **EIC**. **CONTRACTOR** shall ensure that technical quality standards are adhered to during work execution is carried out cost effectively and a good customer and public image is maintained for **GEL**.
- **CONTRACTOR'S** supervisor shall have mobile phones to ensure that they can be contacted at all times. The **CONTRACTOR** will also nominate one person who can be contacted if necessary in odd hours, for the duration of the works. The **CONTRACTOR'S** supervisor will have access to transport at all times to allow them to visit sites and attend meetings with **GEL**. The normal day-to-day issue of work instructions, communication will be between **EIC AND THE CONTRACTOR'S** supervisor and the Site Engineer.
- **Recruitment of Personnel by CONTRACTOR**
CONTRACTOR shall not recruit personnel of any category from among those who are already employed by other agencies working at the various sites of **GEL**. However, **CONTRACTOR** shall give priority and make maximum use of local workers available. If in any case **CONTRACTOR** wants to recruit personal of any category from among those who are already employed by other agencies working at the various sites of **GEL** than **CONTRACTOR** have to get No Objection Certificate from other agencies.
CONTRACTOR man power mentioned above shall undergo all relevant safety and technical competency training as per the “Training Applicability Matrix” prior to deployment at site.
- **CONTRACTOR** to depute the manpower which are trained and certified for the relevant activities preferably by the Government recognized training schemes and institutes like PRADHANMANTRI KAUSHAL VIKAS YOJNA FOR TECHNICAL INSTITUTES (PMKVY-TI), NATIONAL SKILL DEVELOPMENT MISSION (NSDM), HYDROCARBON SECTOR SKILL INSTITUTE (HSSC), NATIONAL SKILL TRAINING INSTITUTE (NSTI) etc.

3.2.5 Identification of Threats

Root causes were identified for threat to pipeline integrity. Threats have been grouped into three groups based on time dependency and further in to nine categories of related failure types according to their nature and growth characteristic as given below:

1. Time Dependent Threats

- External Corrosion
- Internal Corrosion
- Stress Corrosion Cracking

2. Stable Threats

2.1 Manufacturing related defects

- Defective pipe seam
- Defective pipe

2.2 Welding /fabrication related

- Defective pipe girth weld
- Defective fabrication weld
- Wrinkle bend or buckle
- Stripped threads /broken pipe /coupling failure

2.3 Equipment

- Gasket O-ring failure
- Control/relief equipment malfunction
- Seal pump packing failure
- Miscellaneous

3. Time independent Threats

3.1 Third party /mechanical damage:

- Damage inflicted by first, second or third party (instantaneous /immediate failure)
- Previously damaged pipe (delayed failure mode)
- Vandalism
- Rat bites
- Electric Arching

3.2 Incorrect operational procedure

3.3 Weather related and outside force

- Weather related
- Lightning
- Heavy Rains or Floods
- Earth Movements
-

3.2.6 MAINTENANCE MANAGEMENT

Scheduled/ Preventive maintenance

CONTRACTOR has to carry out scheduled/Preventive maintenance as per the AOMP/ Schedule provide by **GEL EIC**. **CONTRACTOR** has to arrange all the required skilled/Unskilled manpower with tools tackles, consumables, machinery etc... to perform the maintenance activity.

GEL EIC shall give planning through written communication (E-Mail) for Scheduled/ Preventive maintenance well in advance. Scheduled / Planned preventive Maintenance to be carried out within 15 days from the due date of maintenance. In case there is delay in executing the Scheduled/ planned preventive maintenance, penalty as per the clause of Penalty will be levied by **GEL**. Following but not limited to, shall be carried out by the **CONTRACTOR** as per frequencies defined in **GEL** approved AOMP, procedures and Guidelines.

- Maintenance of CGS, Tap off locations, connectivity locations and FMS and associated activities
- Maintenance of odorant system and associated activities
- LDT and SPT of steel pipeline distribution network
- Maintenance and associated activities of Cathodic Protection System
- Thickness assessment of pressure vessels
- Functional testing of SRV and calibration of instruments
- Maintenance, housekeeping and associated activities for valves and valve chambers
- Repair/installation/replacement of pipeline route markers

Shut down maintenance

CONTRACTOR has to be ready for any planned shutdown job. **CONTRACTOR** has to deploy required skilled/Unskilled manpower with required tools tackles, consumables, Machinery etc. as instructed By **GEL EIC**.

GEL EIC shall give planning through written communication (E-Mail) for Shut down maintenance well in advance, at least 15 days prior to scheduled shut down. By considering the importance of uninterrupted gas flow for downstream customers, under no circumstances delay is allowed for the planned shutdown. if any delay is envisaged against planned maintenance schedule, due to unforeseen circumstances the same has to be discussed with **GEL EIC** and implement mutually decided action plan. A penalty as per clause of penalty matrix will be levied by **GEL** in case of delay in attending the shutdown maintenance without prior approval of the EIC.

Break down maintenance

CONTRACTOR has to maintain minimum manpower as mentioned in the tender document to attend any emergency/break down maintenance job that can arise on steel pipeline network & associated facilities. **CONTRACTOR** has to follow instructions given by **GEL EIC**.

Major Break down activity: Major break down will be declared by GEL EIC after assessing the situation

- Repairing the leakage of existing above ground pipe by using leak repair clamps or replacement as is decided by **GEL EIC**.
- Repairing the leakage of existing buried pipeline by using leak repair clamps or replacement as is decided by **GEL EIC**.
- Any leakages from the instruments/Equipments/Valves/Pipelines/Fittings that represent existing or probable hazards to person or property shall be attended by the **CONTRACTOR** team immediately for ensuring situation is under control and do not reach hazardous situation.

CONTRACTOR has to reach at site with all required material, manpower, Machines, Tools & tackles on receiving information and follow the instruction given by EIC after reaching the site in case of major break down activity within stipulated time mentioned below.

Sr. No	Distance of the break down site from the set-up location of the CONTRACTOR	Time required to mobilize resources and reach break down site
1	<=100 KM	4 hours
2	>100 KM upto 200 kms	8 hours

GEL EIC/Representative shall give verbal intimation on call and SMS in case of any emergency/ Break down activity. In case of delay in reaching the site within the time specified above and take necessary corrective action for controlling / monitoring the leakage. A penalty as per Penalty clause will be levied by **GEL**.

Minor Break down activity

Some of the breakdowns which can be considered as minor in nature are

- Repairing of field joint coating of damaged pipe area
- Bubble leakage from valves/fittings/Gaskets/flanges <1000 PPM
- Damage to fencing/valve chamber/boundary wall/DRS/CPRS canopy/SR Canopy

CONTRACTOR has to reach at site with all required manpower, Machines, Tools & tackles on receipt of information from EIC and follow the instruction given by EIC. Minor break down activity needs to be attended within 48 hours. However, looking at the site situation EIC may delay the job and intimate to the **CONTRACTOR**.

GEL EIC/Representative shall give verbal intimation on call and SMS in case of any minor Break down activity. In case of delay of attending the Break down maintenance, a penalty as per penalty clause will be levied by **GEL**.

3.3 GEL SCOPE OF WORK

- Issue of Line pipes, equipments like DRS/CPRS/ DPRS / IPRS / MRS etc., for replacement, modification, up gradation activities
- Provide High level activity plan and/or Permit to Work.
- Provide principal permissions from authority having jurisdiction. **GEL** shall provide / approve SOP's and Guideline for execution of activities for compliances of Quality and HSE required for completing the work.

- The Detailed alignment sheet, Detailed Route survey and Soil investigation report (if needed), Issued for Construction drawings, shut-down drawings for proposed routes/ activities, may be provided (as and where required) to the **CONTRACTOR** by **GEL** for cross country terrain or the pipe lines in outskirts of city. For pipe lines within the city in-house survey drawings will be made available (as and where applicable). The acquisition of Right of Use (RoU) or statutory permission (in principal), shall be obtained by the Company.
- In case of steel pipeline laying activity, the project shall be inspected and certified by a Third-Party Agency (TPA)/**GEL** Representative appointed by **GEL** from Engineering design review, work execution, commissioning to certification as per ASME B 31.8 "Gas Transmission and Distribution Piping System" and PNGRB Standard with any additional requirements demanded by the regulator for PNGRB during execution of work.

3.4 WORK MANAGEMENT

3.4.1 LOCATION OF SITE

The location of work site shall be provided in detailed job order issued from time to time across **GEL** operation areas.

CONTRACTOR shall provide and get all necessary material, equipment, tools, tackles, labor etc. approved (Fit for Purpose) through TPA / **GEL** for execution and maintenance of the work till completion.

CONTRACTOR shall, with due care and diligence, execute the work in compliance with all laws, by-laws, ordinances, regulations, **GEL** Business Principal etc. and provide all services and labor inclusive of supervision thereof. All materials, equipment, appliances, or other things of whatsoever nature required in or about the execution of the work, whether of a temporary or permanent nature shall be provided by the **CONTRACTOR**.

CONTRACTOR shall, in connection with the work, provide and maintain at his own cost, all lights, guards, fencing, watch, etc. when and where necessary or required by **GEL**/TPA or by any duly Constituted Authority for the protection of the work and properties for the safety and convenience of the public and / or others.

3.4.2 EQUIPMENT AND SITE ORGANIZATION

Equipment

CONTRACTOR shall without prejudice to his overall responsibility to execute and complete the work as per specifications, time agreed in Job order, progressively deploy at site adequate equipment, tools and tackles and augment the same as decided by the **GEL**/TPIA depending on the exigencies of work so as to suit the construction schedule. All equipments shall be "FIT FOR USE" with equipment fitness certificate / relevant calibration certificates. Audit / Inspection of all equipment shall be carried out by **GEL** at **CONTRACTOR** place / site prior to mobilize equipment.

Site Organization

Subject to the provisions in the Bid Document and without prejudice to **CONTRACTOR**'s liabilities and responsibilities to provide adequate qualified and skilled personnel on the work, **CONTRACTOR** shall deploy site organization and augment the same as decided by the EIC depending on the exigencies of work.

Recruitment of Personnel by **CONTRACTOR**

CONTRACTOR shall not recruit personnel of any category from among those who are already employed by other agencies working at the various sites of **GEL**. However, **CONTRACTOR** shall give priority and make maximum use of local workers available. If in any case **CONTRACTOR** want to recruit personal of any category from among those who are already employed by other agencies working at the various sites of **GEL** than **CONTRACTOR** have to get No Objection Certificate from other agencies.

3.4.3 WATER SUPPLY

CONTRACTOR will have to make his own arrangements for supply of water (potable water as per standard) to his labor camps and for works.

3.4.4 POWER SUPPLY

It shall be the responsibility of the **CONTRACTOR** to provide electrical power supply to its equipment's at site and to his labor camps. All the cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety rules etc.

3.4.5 LAND FOR CONTRACTOR'S FIELD OFFICE, GODOWN, STORE, CAMP AND WORKSHOP

CONTRACTOR shall at his own cost hires the facilities or provide land to construct all these temporary facilities including Camp site for technical staff and for Migrant Labor, line pipe stockyard and provide suitable water supply and sanitary arrangements. **GEL** as a part of mobilization would audit the facilities with respect to HSE requirements.

a) Pipe yard / Godown with

- Secured Boundaries
- Elevated or prevented against logging of water
- Stable ground for stocking of line pipes and the vehicular movements
- Stable approach for Movements of pipe loaded tailor
- Support to avoid rolling over of pipe from pipe stack
- Covering protection against Rain
- Covering of end of pipe by night cap
- Free from passing over head electrical wire
- First Aid facilities

Preferably, The **CONTRACTOR** needs to clearly separate out the camp yard and pipe yard from a risk reduction purpose.

3.4.6 INFORMATION – VERIFICATION & RESPONSIBILITY

CONTRACTOR in fixing his rate shall be, for all-purpose, whatsoever reason may be, deemed to have himself independently obtained all necessary information for the purpose of preparing his BID as accepted and shall be deemed to have considered all contingencies as may arise due to such information or lack of same.

CONTRACTOR shall be deemed to have inspected and examined the work area and its surroundings and to have satisfied himself so far as practicable as to the form and nature thereof, including subsurface conditions, the extent and nature of work and

materials necessary for the completion of the work and the means of access to the work area.

CONTRACTOR shall be deemed to have obtained all necessary information on subject as mentioned above as to risks, contingencies and all other circumstances, which may influence the work.

3.4.7 WORK IN MONSOON AND DE-WATERING

The execution of the WORK may entail working in the monsoon and areas requiring extensive dewatering with ensuring all the required safety measures are taken to maintain site in workable condition. The **CONTRACTOR** must maintain a minimum labor force and necessary dewatering pump as may be required to make the site safe for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such an activity.

Work during Monsoon period is subject to prior approval from **GEL** and availability of permission from the authority. Risk profile for work during monsoon shall be prepared, and get it approved from **GEL** prior to start of the work during monsoon. All the mitigation actions suggested in Risk profile shall be ensured by **CONTRACTOR**. No extra cost will be paid for such risk mitigation.

3.4.8 MECHANIZATION OF ACTIVITIES

CONTRACTOR shall without prejudice to his responsibility to execute and complete the work strictly as per the specifications, HSE Compliances and within the stipulated TIME PERIOD, mechanize the activities to the maximum extent by deploying all necessary equipment / machinery in adequate numbers and capacities and commensurate with the extent of enhanced mechanization required to suit the work schedule / progress reviewed from time to time as per recommendation of the **GEL/TPIA**.

3.4.9 WORK RESPONSIBILITY

From the commencement to completion of the WORK, the **CONTRACTOR** shall take full responsibility for the all works including all temporary works and in case any damages, loss or injury to employees / TPI & Labour , to any permanent work or to any part thereof or to any temporary works from any cause whatsoever, **CONTRACTOR** shall at his own cost repair and make in good order and in conformity in every respects with the requirement of the **CONTRACT** and the **GEL/TPIA's** instruction. **CONTRACTOR** shall have public liability and property damage insurance.

3.5 INSPECTION AND DOCUMENTATION

3.5.1 ACTIONS, WHERE NO SPECIFICATION IS ISSUED

In the absence of specifications covering any material, design of work(s) the same shall be performed/ supplied/ executed in accordance with Standard Engineering Practice covered in latest edition of ASME/ ANSI B31.8, API-1104, OISD-141 & respective OISD etc. and/ or Technical Specification which will be supplied to **CONTRACTOR** at site during or prior to execution work or as per the instructions/ directions of the Engineer-in-charge, which will be binding on the **CONTRACTOR**.

3.5.2 TESTS AND INSPECTION

- **CONTRACTOR** shall carry out various tests as enumerated in the technical specifications of this bid document and the technical documents that will be furnished to him during the performance of the work and no separate payment shall be made unless otherwise stipulated.

- All the tests either on the field or at outside laboratories, concerning the execution of the work and supply of materials by the **CONTRACTOR** shall be carried out by **CONTRACTOR** at his own cost.
- The work is subject to inspection at all times by TPIA/**GEL**. The **CONTRACTOR** shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this bid, the technical documents and the relevant codes of practice furnished to him during the performance of the work.

3.5.3 ERECTION AND INSTALLATION

CONTRACTOR shall carry out required supervision and inspection as per Quality Assurance plans and furnish all assistance required by the **GEL/TPIA** in carrying out inspection work during this phase. The **GEL** will have engineers; inspectors or other authorized representatives present who shall have free access to the work at all time. If **GEL/TPIA**'s representative notifies the **CONTRACTOR**'s authorized representative of any deficiency requirements, or recommends action regarding compliance with the specifications, and/or HSE, the **CONTRACTOR** shall make every effort to carry out such instructions to complete the work conforming to such requirements.

3.5.4 LINE DRAWINGS AND PIPE BOOK

In case of Pipeline laying activities, the **CONTRACTOR** shall prepare Line Drawings of pipeline section showing as laid pipeline Reference measurement with respect to permanent structure, Direction change i.e. Horizontals and the Verticals, and chainage and submit it to **GEL/TPIA**.

Further **CONTRACTOR** shall prepare a pipe book as per approved format and weld book along with the line diagram indicating pipe number, joint numbers and submit it to **GEL** after completion of each spread / section before hydrostatic testing.

3.5.5 DOCUMENTATION

"AS BUILT" DRAWINGS"

Notwithstanding the provisions contained in standard specifications, upon completion of WORK, the **CONTRACTOR** shall complete all of the related drawings to the "AS BUILT" stage (including all vendor / sub vendor drawings for bought out items) and provide the COMPANY, the following.

- One complete set of original size prints (Hard Prints) and 1 set of xerox copy.
- Soft copies / scan copies of all project documents & full-size reproducible Drawing (Digital format of latest available version/ informed by **GEL** of AutoCAD) in CDs or USB – 3 sets
- Soft copies / scan copies of all technical documents in CDs or USB – 3 sets

CONTRACTOR to refer **GEL** guideline and templates for preparation of as-built drawings.

"Hand Over Take over Document"

CONTRACTOR shall prepare and submit Hand over Take over Documents (2 sets) along with all original one day before the commissioning as part of documentation in line with **GEL** IMS procedures for respective activity.

3.5.6 COMPLETION DOCUMENT

CONTRACTOR as a part of completion documents shall submit during and immediately after the construction in original, one copy in hard binder as well as 2 copies in CD.

3.6 HEALTH, SAFETY AND ENVIRONMENT (HSE)

3.6.1 SCOPE AND APPLICATION

CONTRACTOR are the key stake holder and an integral part of **GEL** business. **CONTRACTOR'S** Quality, Health, Safety and Environment (QHSE) performance reflects on the **COMPANY'S** business performance and reputation. **GEL** has established QHSE Management Systems, Procedures & Guidelines to ensure compliance with **GEL's** QHSE requirements. These requirements apply to all jobs whilst conducting work for **GEL** including; Project, Construction, Operation & Maintenance, Field Operations and Services within any given **CONTRACT** or agreement.

The overall objective of QHSE management in **CONTRACT/** agreement is to improve the company and **CONTRACTOR'S** QHSE performance in all aspects of activities. Active and on-going participation by both the **GEL** and **CONTRACTOR** is essential to achieve this objective.

3.6.2 RESPONSIBILITIES

- It is responsibility of **GEL** management and staffs to ensure that all **CONTRACTORS** work under their direction & control are provided with relevant Integrated Management System (IMS) Policies, Procedures & Guidelines that describe the **GEL** requirements for undertaking work within the **COMPANY**. It is also the responsibility of **CONTRACTORS** to ensure that their staff are informed of and comply with **GEL's** requirement whilst working for the company.
- **GEL** HSE department provides advice and assistance on QHSE requirements across the complete spectrum of all work activities. Contract Owner (Department Head) and Contract Holder (Work in-charge) are responsible to ensure safe execution of work/ service include the following:
 - Ensuring that the QHSE Policy, Procedures & Guidelines are known and understood by all **CONTRACTORS'** staff and work force
 - Monitoring, Inspecting & Auditing execution of work, activities to ensure adherence to the QHSE compliance requirements
 - The **CONTRACTORS'** will take the responsibility for implementation of **GEL's** QHSE Policy, Procedures, Guidelines and other requirements with the advice and support of the **GEL's** Contract Owner/ Contract Holder and HSE representative.
- **CONTRACTOR** to ensure that all aspects of QHSE are adequately addressed and implemented in accordance with the QHSE requirements and QHSE Management Plan, which shall include the management processes and activities to be implemented during the course of work.
- **CONTRACTOR** shall be responsible for ensuring that adequate HSE resources are put in place to enable satisfactory implementation of QHSE Management Plan.

- This responsibility also applies to ensure the Health and Safety of the people are directly and indirectly engaged/ involved whilst working or present at **GEL's** work area/ sites.

3.6.3 EXECUTION

- **CONTRACTOR** shall follow and comply with **GEL** "Work Permit" system
- During work execution and activities, **GEL** team will regularly monitor and evaluate the performance of the **CONTRACTOR** to identify the shortfalls and weaknesses and assist to improve the overall performance including QHSE performance through CPAR process (as applicable).
- We believe that everyone at **GEL**, Employees, **CONTRACTORS** and Associates have the right to go home safely to their families.

Remark: Issuance of MEMO against HSE non-compliances including above mentioned defaults shall be decided by Contract Holder

3.6.4 QUALITY and HSE GUIDELINE (AS APPLICABLE)

- **CONTRACTOR** shall ensure that all staff/ work force comply with the requirements of the **GEL** HSE Management System, Quality policy, HSE policy, standard, procedures, guideline, plan & Life Savers at work site
- **CONTRACTOR** shall ensure issuance of Identity Card to their team members
- **CONTRACTOR** shall apply and obtain Permit to work (PTW/ WA) before start of the work
- **CONTRACTOR** shall arrange work related Personal Protective Equipment (PPEs) for their staff/ work force and ensure proper use during the execution of job
- **CONTRACTOR** shall carry out the work within the duty hours'/ office hours. No Work shall be carried out without permission of **GEL's** representative beyond the official duty hours unless otherwise agreed upon prior to start of work and recorded appropriately
- **CONTRACTOR** shall ensure that all tools, tackles, appliances, machines, vehicles, instruments or other equipment are Fit for Purpose and maintained safe working condition at all times and are used only by authorized and competent persons
- **CONTRACTOR** shall ensure that all the QHSE requirements are properly discussed for any sub-contracted activities with **GEL**. No such activity shall be performed without clearance from **GEL** management
- **CONTRACTOR** shall ensure that all Hazards, near miss, accident, incident, injuries are reported promptly to **GEL**. Action arises due to reported Hazards, near miss, incident investigation; audit/ inspection shall be closed out as per agreed timelines with site in-charge
- **CONTRACTOR** shall deploy staff & work force trained, qualified and competent for the work and well aware of risks and mitigation action/s for the activities undertaken
- **CONTRACTOR** shall make necessary arrangements for safe custody of equipment, materials in stores/ warehouse and at site

- **CONTRACTOR** shall ensure safe transportation, storage and handling of materials to prevent any damage which may impair safe performance of the equipment/ material etc.
- **CONTRACTOR** shall initiate immediate actions to hospitalize injured person(s)
- **CONTRACTOR** shall ensure an injury free, incident free workplace and protect people from harm caused by work activities
- **CONTRACTOR** shall ensure use of seatbelts while driving four-wheeler and use of crash helmet for Two-wheeler riders during job execution
- **CONTRACTOR** shall ensure Lock out and Tag out (LOTO) after de-energizing and double check before starting any jobs. In case of conducting job for the purpose of fault finding & monitoring of voltage & current it is to be considered live working and all PPE'S to be worn to avoid exposure of flash arc current
- **CONTRACTOR** shall take note that the use of open wires in sockets, use of wires with tape joints shall not be accepted at work site.
- **CONTRACTOR** shall ensure proper collection, storage and disposal of solid/ liquid waste as per **GEL** procedure and guideline
- **CONTRACTOR** staff/ work force shall not smoke or resort to misuse of drugs, medicines or alcohol while on duty.
- In case of any incident like fire, gas leakage etc. due to gross negligence of the **CONTRACTOR'S** staff/ work force, **GEL** reserves the right to impose penalty up to actual damage cost and or termination of work order depending upon the gravity of the situation.
- Any breach of the QHSE requirements shall be deemed by the **COMPANY** to be a material breach of the terms & condition of the **CONTRACT**. **GEL** shall be entitled to take appropriate actions including instructing the **CONTRACTOR** to (a) remedy the breach; (b) suspend the work or (c) terminate the **CONTRACT**.
- All activities shall be carried out as per **GEL's** documented procedures and QHSE requirements, deviation from it shall be dealt with very strictly

3.6.5 GENERAL SAFETY REGULATION

- **CONTRACTOR** shall comply with all HSE related statutory requirements including labor laws relevant to the activities. Legal compliance matrix shall be prepared by **CONTRACTOR**.
- In respect of all labor, directly or indirectly employed in the WORK for the performance of **CONTRACTOR's** part of this agreement, the **CONTRACTOR** shall at his own expense arrange for all the safety provisions as per safety codes of Indian Standards Institution, The Electricity Act, the Mines Act and such other acts as applicable.
- **CONTRACTOR** shall maintain first aid facilities for its employees and those of its SUB-**CONTRACTOR**.

- **CONTRACTOR** shall adhere to safe construction practice and guard against hazards and unsafe working conditions and shall comply with **GEL/ TPIA's** safety HSE standards (Refer to **GEL's** Life saver)
- All critical incidents shall be reported promptly to **GEL**.
- **CONTRACTOR** shall carry out HSE Management. **CONTRACTOR** shall prepare the job Specific Risk Assessment after detail site survey and Mitigation Action Plan according to "Risk register". It will be approved by **GEL** Project in charge. The same will be displayed on site and will be discussed in daily tool box as projects progress.
- **CONTRACTOR** shall depute qualified and experienced HSE engineer to undertake HSE related activities of job.
- All necessary personal safety equipment as considered adequate as per approved PPE Matrix provided by **GEL** should be kept available for the use of the persons employed on the SITE and maintained in condition suitable for immediate use, and the **CONTRACTOR** shall take adequate steps to ensure proper use of equipment by those concerned.
- "**CONTRACTOR**" shall ensure that all the near misses occurred during execution of the **CONTRACT** are reported time to time to **GEL**. Any hazard spotted while on job shall be reported to **GEL** for further mitigation.
- The "**CONTRACTOR**" shall ensure that all the HSE requirements are properly discussed for any sub-contracted activities with the staff employed to do the sub-contracted activity. No such activity shall be performed without clearance from **GEL** Work In-Charge.
- "**CONTRACTOR**" shall strictly abide by the approved work permit system/ Permit to Work wherever applicable and explained by the **GEL** work in-charge.
- All personnel working in the project shall be trained & educated for Basic Safety awareness as per requirements of **GEL**. He/ She shall be well aware of risk and mitigation action/s for the activities undertaken.

3.6.6 HEALTH SAFETY & ENVIRONMENT (GENERAL)

Before initiating activities against the order, "**CONTRACTOR**" and **GEL/ TPI** representative should ensure following:

- The employee only belongs to the **CONTRACTOR** are allowed for the work at site
- All the employee of **CONTRACTOR** is checked for "Medically fit".
- **CONTRACTOR** shall comply with all HSE life saver requirements.
- Deployed equipment, Machinery, tools & Tackles are inspected for "Fit for Use" before it sent to the site for performing the activities. Equipment "fit for use" shall be available with equipment at site and same shall be reviewed timely.
- **CONTRACTOR** shall prepare a separate HSE plan for execution of various activities at site. The same shall be approved by **GEL** before start of work.
- Site Specific Risk Assessment is done on daily basis and in case of change in site conditions

- Risk Mitigation plan for each risk is decided as per the OSHAS Risk register communicated by **GEL**.
- First aid facilities shall be maintained at each site, office, and store. Trained first aid provider shall be provided by **CONTRACTOR**.
- A Toolbox talk is conducted at each site/ activity with all the involved to updates them on each risk with required Mitigation action.
- **CONTRACTOR** shall erect and maintain barricade required in connection with this operation to guard the work site as directed by **GEL**.
- **CONTRACTOR** shall ensure proper disposal of solid/ liquid waste and shall ensure to follow the legal requirements associated with waste handling and shall maintain waste disposal record. If found appropriate, these requirements shall form part of the HSE orientation discussions held before commencement of the job.
- **CONTRACTOR** must ensure that tools, appliances, machines, vehicles or other equipment which are going to be used for the job are periodically inspected and maintained. The **CONTRACTOR** shall maintain records of these inspections and modification activities. **GEL** reserves the rights to verify these records and prohibit use of items not found fit for use.
- **CONTRACTOR** personnel shall not smoke or resort to misuse of drugs, medicines or alcohol while on duty. **CONTRACTOR** shall also ensure that in no case the ability of his employees to carry out their assigned duty is impaired by use of the substances mentioned herein.
- **CONTRACTOR** shall comply with all applicable statutory requirements.
- No child labor below 18 years of age shall be employed by the **CONTRACTOR** during the execution of job.
- Qualified employee If behave unsafely at site shall be disqualified for working at site
- The safe working practice Guideline for specific pipeline construction related activities is implemented during execution of projects.
- **CONTRACTOR** shall ensure that as a minimum, but not limited to, these guidelines shall be followed and ensured by its personnel/ sub-**CONTRACTOR** at work site/ office at all the times.

3.6.7 SAFE SYSTEMS OF WORK (GEL LIFE SAVERS)

Safe Systems of Work provide the foundations for safety in all of our activities, it is one of the most important and critical Life savers for our business. It covers almost all operations and affects everyone at **GEL**.

CONTRACTOR shall refer and ensure compliance to **GEL** guidelines and requirement for **GEL** Life Saver during all planned and unplanned O&M activities.

- No work is to proceed unless a risk assessment has been carried out.
- All persons must be trained and competent to carry out the intended task.

- Before starting work, an appropriate emergency plan must be established and tested.
- Daily site plan must be communicated to **GEL**.
- Before starting work, check if permit to Work (PTW) is required.
- The PTW must have a detail scope of work, clearly identifying hazard and associated risk and control measures.
- The PTW must be issued by a competent authority.
- All relevant information should be communicated to all involved in the work through Tool Box talk before start of the work/ activities.
- PPE's must be as per risk assessment and as per any additional minimum site requirements
- Before working on isolated facilities, check that all electrical, process and mechanical isolations have been completed by the appropriate authorized person.
- Change to plant and equipment or procedures must place via an approved management of change procedure.
- If not sure about the task or ability to perform safely, stop the job and discuss it with Engineer In charge.
- Ensure adequate control in handover to normal operations.

4. ANNEXURES

Annexure 1 - Detailed scope of work for pipeline laying

Annexure 2(a) - Technical specification for welding of station piping

Annexure 2(b) - Standard specification for fabrication and erection of piping

Annexure 3: Scope of work for Thickness measurement

Annexure-4: Scope of work for SRV/CRV calibration

Annexure-5: Calibration and testing of Instruments and control equipments

Annexure-6: Specification for Civil Construction and Allied Work

Annexure-7: Typical Drawings

Annexure-8: Technical scope of work for Pipeline installation by HDD

Annexure-9: Technical Specification for Stud bolts, Nuts & Gaskets

Annexure-10: Piping Material Specification

Annexure-11: Detailed Methodology for carrying out Valve & Valve Chamber Maintenance

Annexure-12: Mandatory Requirement for Manpower, Machinery, Tools-tackles

Annexure-13: AOMP – Annual Operation and Maintenance Plan

Annexure-14: **GEL** Life Savers

Annexure-15: Typical Forms/Formats for Steel pipeline operation & maintenance

Annexure-16: Typical Forms/Formats for Steel Pipeline Construction

Annexure-17: Typical Forms/Formats for Health-Safety-Environment

Annexure-18: Technical Specifications-FRP covers for valve chambers