

GENERAL SPECIFICATION

PIPELINES - RISERS

GS EP PLR 403

Installation of onshore pipelines

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1. Scope

The present general specification defines the requirements for installation of onshore pipelines transporting fluids such as gas or liquid hydrocarbons, chemicals, water, etc. The subject pipelines can be made of steel, composite or plastic: HDPE (High Density Polyethylene), GRE / GRP (Glass Reinforced Epoxy / Plastic), RTPPE (Reinforced Thermoplastic Polyethylene), etc.

It is outlined that:

- For areas with important changes of elevation, this General Specification shall be used with care when addressing points such as testing and pre-commissioning activities. Upon Company approval Contractor's experience in these domains could be used wherever this General Specification is silent.
- This General Specification does not cover areas of temporary or permanent swamp or permafrost. In this case, PPS shall be prepared and submitted to Company approval.

This specification shall be read in conjunction with [GS EP PLR 104](#), [ASME B31.4](#), [ASME B31.8](#), [DNVGL-ST-F101](#) and [ISO 13623](#) as applicable.

Alternate methods may be proposed in the frame of the Works; meanwhile, in such cases these alternates shall reflect as a minimum the requirements set out in the present General Specification.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published at the effective date of this document.

Reference	Title
API RP 1102	Steel Pipelines Crossing Railroads and Highways
ASME B31.4	Pipeline Transportation Systems for Liquids and Slurries
ASME B31.8	Gas Transmission and Distribution Piping Systems
DNVGL-ST-F101	Submarine Pipeline System
ISO 13623	Petroleum and natural gas industries - Pipeline transportation systems

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Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published.

Reference	Title
GS EP COR 110	External cathodic protection of onshore structures
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 354	External protection of onshore structures and equipment by painting
GS EP COR 420	External field joint coatings of pipelines
GS EP EXP 101	Pre-commissioning and commissioning specification
GS EP EXP 103	Pre-commissioning and commissioning engineering and preparation
GS EP EXP 105	Pre-commissioning execution
GS EP GEO 401	GIS requirements for engineering site surveys and studies
GS EP PJC 702	Requirements for electronic documents at project execution and field operations phases
GS EP PJC 703	Requirements for Contractor Final Documentation
GS EP PLR 104	Onshore pipeline systems
GS EP PLR 205	Carbon steel, pipe manufacturing for pipeline applications according to API SPEC 5L and DNVGL-ST-F101
GS EP PLR 226	Fabrication of hot bends for pipelines
GS EP PLR 320	High Density Polyethylene (HDPE) - PE 100 pipelines - Design, manufacturing, construction and integrity management
GS EP PLR 321	Glass Reinforced Epoxy (GRE) Pipelines - Design, Manufacturing, Construction and Integrity Management
GS EP PLR 322	Reinforced thermoplastic polyethylene pipes for pipelines - Design, manufacturing, construction and integrity management
GS EP PLR 406	Storage, handling and transportation of pipes
GS EP PLR 410	Concrete coating for submarine pipelines
GS EP PLR 425	Site welding of carbon steel pipelines (sweet and sour service, onshore and offshore) according to API STD 1104
GS EP PLR 426	Site welding of carbon steel and CRA pipelines (sweet and sour service, onshore and offshore) according to DNV-OS-F101
GS EP PLR 430	Automated ultrasonic testing of pipeline girth welds according to DNV standards

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Reference	Title
GS EP PLR 431	Real time radioscopy inspection
GS EP PLR 432	Time Of Flight Diffraction TOFD inspection
GS EP PLR 501	Hydrostatic testing of pipelines
GS EP PLR 502	Pre-commissioning of pipelines
GS EP POS 003	Land surveying and positioning works
GS EP SAF 041	Technological risk assessment methodology
GS EP STR 411	Crane and transport operations onshore

3. Applicability

The present general specification applies for installation of onshore pipelines transporting fluids such as gas or liquid hydrocarbons, chemicals, water, etc. The subject pipelines can be made of steel, composite or plastic pipes.

4. Definitions of terms

The definitions and abbreviations stipulated in the [GS EP PLR 104](#) shall apply.

The following definitions and abbreviations shall be used:

Commissioning:	All tasks and operations performed on the pipeline subsequent to pre-commissioning and which concern the initial introduction of hydrocarbon gas in the pipeline. It should be noted that pre-commissioning is a construction activity whereas commissioning is an operator activity.
Company:	Any entity of the TOTAL Group mentioned in the contract or the order.
Company Representative:	Means the representative of the Company on the work sites, as stipulated in the PPS.
Contractor:	Means the main Contractor and its Sub-Contractors in charge of the Works covered by the PPS and the present General Specification.
Equipment:	Is used for all ancillary items of the pre-commissioning, not part of the permanent facilities.
General Specification (GS):	Gives the general requirements for execution of the Works, subject of a contract.
Golden weld:	A weld which has not been pressure tested, and is therefore subject to additional non-destructive testing (NDT).
Leak test:	A pipeline pressure test designed to determine the presence or absence of leaks in a pipeline system. A leak test can be used alone or in addition to a strength pressure test, as required by the PPS.

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Local Authority:	Means any Local Authorities, which are involved in the design and installation processes.
Operator:	Entity of the Company who will receive the installations after pre-commissioning and will operate them with a view to commercial production.
Owner:	Means the owner of a land, service or facility which the Right of Way of the pipeline shall cross, or the owner of land that shall be occupied for the works, on a temporary basis.
Particular Project Specification (PPS):	Gives the specific requirements for execution of the Works, subject of a contract.
Pipeline:	The pipeline is a section of a system or the entire system, used for the transport of hydrocarbon gas. It extends from pig trap to pig trap, including all permanent items, such as pipe, header, piping, pig trap, valves, isolating joints, coating, anodes, etc., when they exist. The system limits are identified in the Particular Project Specification.
Pre-commissioning:	All tasks and operations performed on the pipeline subsequent to the pipeline construction and prior to the introduction of hydrocarbon products.
Pressure test:	A pressure test designed to establish the operating pressure limit of a pipeline as required by the design code or regulation.
Right of Way (RoW):	The area where the pipeline will be built, which may need permanent access during the life of the pipeline.
Supplier:	Means the supplier of the line pipes, fittings, ancillary equipment and consumables needed for the Works.
Works:	Means the whole of the site surveys, the site preparation, the assembly and installation of the pipeline and of its ancillary equipment, pre-commissioning, testing, and the site restoration works.

5. Safety and environmental requirements

5.1 General

During the preparation and the execution of the Works, the Safety and Environmental requirements shall be compliant with Company requirements.

Any potential impacts of the construction works regarding noise, venting, flooding, possible spillage, disposals, smells, electrical / radio interference, positioning equipment, geodetic points, lights, etc., on the, local populations, working personnel, existing constructions, existing infrastructure, energy distribution networks, asset, flora and fauna, shore profile, rivers, etc. shall be evaluated and documented.

International and local relevant authorities or agencies will be listed and consulted as requested by the Company.

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Permanent and temporary markings shall be erected so as to keep public aware of the risks and damageable consequences associated with the Works.

The equipment intended for the execution of the Works shall be certified, maintained in good condition, so as being fit for safety and environmental purposes.

5.2 Safety

At all times throughout the life of the Project and during execution of the Work, risk assessments shall be in compliance with **GS EP SAF 041**.

Job specific risk analysis (or equivalent) shall be performed to cover all operations of the construction campaign.

Findings of the risk assessments conducted in the office shall be revisited and reviewed at the construction site by the key construction personnel and Company Representatives before beginning of the work in order to confirm that the risk level is considered acceptable for the activity in question.

As a minimum, safety meetings shall be held with all key personnel working on the site at mobilisation, prior to the start of the Works and on the weekly basis.

5.3 Environment

Over the entire duration of the Works, special care shall be taken of environmental aspects and particularly:

- Temporary occupation of the public and private areas
- Induced disturbance to the human activities
- Vegetation and plantations clearance
- Segregation of excavated top soils and other soils
- Temporary and permanent disposal area for the soils, debris, unused construction materials, consumables, scraps, chemical agents and treated or contaminated water
- Disturbed secondary courses and drained waters
- HDD (or similar) drilling fluid.

A dedicated study shall be carried out to define the impacts of the proposed pipelines on the environment.

5.4 Site reinstatement

The permanent and temporary sites shall be restored in such a way that the environmental disturbances and risks are suppressed. Only approved procedures shall be used complying with requirements specified in section 19.

However, unless otherwise instructed by the Company, temporary positioning, protective and guiding devices shall not be retrieved until satisfactory completion of the installation and pre-commissioning works.

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5.5 Use of explosives

A work permit procedure shall be elaborated in the course of the construction engineering phase and the works involving the use of explosives shall be identified.

Local regulations regarding the procurement and/or use of explosives may apply and they shall be strictly adhered to.

Work permit for use of explosives shall address **each and every work** with explosives, and shall therefore correspond to a **unique location and a unique period of time**.

6. Organization of the Works

6.1 General

The Works shall be executed in compliance with Project Particular Specifications and **GS EP PLR 104**.

The Works shall be comprised of:

- Construction Engineering to supplement the detailed engineering studies
- Route surveys
- Site preparation works
- Site delivery and storage of the line pipes, fittings, ancillary equipment and consumables
- Pipe laying works on the route sections
- Work execution at the special locations
- Pre-commissioning works
- Site restoration works
- Handover of the completion file for the above works.

The requirements of the present document are applicable to carbon steel and CRA (Corrosion Resistant Alloy) pipelines, as referred in **GS EP PLR 205**, **GS EP PLR 425** and **GS EP PLR 426**.

Where applicable, these requirements also apply to "polymer" pipelines (HDPE, RTPE, GRE, GRP...) as defined in **GS EP PLR 321**, **GS EP PLR 320** and **GS EP PLR 322**.

The onshore lifting and transportation operations required for the execution of the works shall be compliant with **GS EP STR 411**.

6.2 Route surveys

At the beginning of the basic engineering, a PPS shall be prepared giving the GIS data requirements (Geographic Information System) and the technical requirements for the future route surveys. Attention shall be paid to the interfacing of pipeline GIS data with the upstream and downstream facilities.

Reference is made to **GS EP POS 003** and to **GS EP GEO 401**, which contains the applicable requirements related to the route surveys.

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6.3 Knowledge of the worksite conditions

The detailed studies and the selection of the installation means, machinery and ancillary equipment shall take into account the specific environmental conditions, such as but not limited to:

- Health, safety and environmental requirements
- Meteorological conditions during the works and during the service life of the pipeline system
- Water tables level, flooding risks, etc. during the works and during the service life of the pipeline system
- Seismic, land slide and liquefaction risks
- Location of seismic faults and whether active or not
- Steep slopes
- Existing private and public properties and facilities
- Environmental and societal impact assessment (ESIA)
- Other local regulations.

6.4 Management activities

Management activities of the Works shall conform to the PPS requirements. As a minimum they shall cover:

- Progress scheduling and reporting procedures
- Quality reporting procedures
- Health, safety and environmental management and track records
- Logistic support for the work-sites, and shows the functional and links between the work-sites and the centralizing office
- Work permit applications, especially for hot works, works on or nearby existing facilities, works with explosives, works on communication ways, private and public zones, etc.: these applications shall be subjected to authorization of the Company Representative
- Advising the landowners of the land sites to be temporarily occupied during the Works
- Providing means and resources to Company Representatives such as offices, local and international communications, and computer with network means, sanitary facilities, and taking care of individual transportation means
- Advising the Local Authorities and obtaining the authorizations necessary for temporarily diverting or interrupting the traffic on the public roads, if applicable.

6.5 Construction Engineering

The Construction Engineering studies shall provide all the necessary instructions, calculations, analyses, procedures and drawings at AFC, "Approved for Construction" level, in conformity with PPS and **GS EP PJC 702** requirements.

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Construction engineering details shall also aim at resolving issues and/or developing alternatives as soon as adverse conditions are locally met in the course of the Works.

They may involve as a minimum:

- Stability of trenches
- Over stabilization of pipeline section, particularly at changes of direction by means of deeper trench, concrete weighting, pipeline anchors or geo-textile bags
- Contingency repair works, following major soil disturbances
- Contingency works as a consequence of unexpected underground live or abandoned pipelines, cables, wrecks, soil pollution, etc.
- Limit the use of elastic roping, when possible, to large bending radius.

6.6 Tie-in to an existing installation

A tie-in to an existing installation shall be executed as per Company approved procedure and after authorization obtained from the Owner or other authority having jurisdiction of the installation (see section 6.7).

The works shall only be initiated in the presence of Company Representatives. Co-activity (like SIMOPS) procedure shall be necessary for a tie in to the live installations.

6.7 Relations with authorities and owners

Application for work authorization shall be organized in due time with relevant authorities and owners, then made accessible during the Works and finally incorporated in the Completion File.

They bear on the authorization to be obtained from the concerned parties and in general, they shall be required for:

- Pre-works statement of condition
- Occupation of the temporary and permanent areas for the Works Excavation, reinforcement, restoration works
- Special applications for works in the vicinity of existing facilities, such as hot works, etc.
- Crossings of existing underground facilities or roads, involving interruption or diversion of traffic
- Transportation of special equipment on roads and waterways
- The full discharge of Contractor from Local Authorities, in the case of damages caused in the public domain under the normal condition of the Works,
- the post-works statement of condition.

6.8 Pre-works statement of condition

The reports and official notes mentioned in this paragraph are subject to section 6.7 requirements.

Before any work is undertaken, the parties shall carry out a thorough inventory of the site within the strip of land delimited by marker posts, which also forms the boundary of the zone put at the