



Exploration & Production

GENERAL SPECIFICATION

PIPELINES - RISERS

GS EP PLR 501

Hydrostatic testing of pipelines

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1. Scope

The scope of this General Specification covers the Company requirements for performing the hydrostatic testing of a pipeline.

This specification applies to hydrostatic testing of land pipelines (onshore), offshore pipelines including their risers, either liquid or gas pipelines.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
API RP 1110	Pressure Testing of Steel Pipelines

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	



Total General Specifications

Reference	Title
GS EP COR 560	Physical and chemical treatment of hydrostatic test water
GS EP PLR 100	Submarine pipeline systems
GS EP PLR 102	Design of submarine pipelines as per API RP 1111 and ANSI B 31.4/31.8
GS EP PLR 103	Design of submarine pipelines as per DNV-OS-F101
GS EP PLR 104	Onshore pipeline systems
GS EP PLR 105	Design of submarine pipelines as per ISO 13623
GS EP PLR 106	Design of onshore pipelines as per ISO 13623
GS EP PLR 502	Precommissioning of gas pipelines

3. Definitions

In the present specification, the following definitions will be used:

Precommissioning All tasks and operations performed on the pipeline subsequent to the pipeline construction and prior to the introduction of hydrocarbon gas.

Commissioning All tasks and operations performed on the pipeline subsequent to precommissioning and which concern the initial introduction of hydrocarbon gas in the pipeline. It should be noted that precommissioning is a construction activity whereas commissioning is an operator activity.

Operator Entity of the Company who will receive the installations after precommissioning and will operate them with a view to commercial production.

Pipeline The pipeline is a section of a system or the entire system, used for the transport of hydrocarbon gas. It can be onshore or offshore, and extends from pig trap to pig trap, including:

- Risers and their supports, when they exist
- All permanent items, such as header, piping, pig trap, valves, isolating joints, etc., when they exist.

The system limits are identified in the Particular Project Specification.

Particular Project Specification (PPS)

Gives the specific requirements for execution of the work, subject of a Contract.

Golden weld A weld which has not been hydrotested, and is therefore subject to additional non-destructive testing (NDT).

May Is used to indicate that a provision is optional.



Shall	Is used to indicate that a provision is mandatory.
Should	Is used to indicate that a provision is not mandatory, but is recommended as good practice.
Equipment	Is used for all ancillary items of the precommissioning, not part of the permanent facilities.

4. General

The land pipelines, the submarine pipelines and their risers, shall be hydrostatically tested as soon as practicable after completion of construction, installation and all anti-corrosion works. The hydrostatic pressure test shall be executed as a holding test during at least 24 hours without interruption.

The hydrotest is the first step into the precommissioning sequence, and is normally performed at the same time as the flooding, cleaning and gauging operations. The remaining precommissioning activities are described in **GS EP PLR 502**.

Prior to the hydrotest, the as-built route survey of offshore pipeline shall have been performed to verify that the pipeline has been laid within the specifications for route, alignment, pipeline crossings, length of free spans, etc.

The battery limits of the test shall be from pig trap to pig trap, and include all pipeline components. The pipeline may be tested as separate sections, provided the sections are isolated from each others, but the test shall never be performed **against closed valve**.

The pipeline valves shall be kept out of the hydrotest / precommissioning sequence, to avoid damages to their internals by debris. The pipeline sectioning shall therefore take into account the valve location, either by replacing the valve by a testing spool, or by testing separately the sections on either side of the valves.

When the valves cannot be easily removed, as for subsea valves, all precautions will be taken not to damage them: pipeline cleaning to be performed before the valves are installed, valves cavities are filled with MEG and valves are not operated until the precommissioning is completed. Flushing of the seats can also be considered, if the valve was designed for it.

The different test sections may be connected by golden welds, if accepted by Company. If all the sections have been successfully hydrotested for 24h, the final hydrotest of the complete system may be waived. The number of golden welds shall be kept to the minimum and imposed by the sectioning linked to the profile of the line, or by specific requirements for keeping the pipeline valves out of the pre-commissioning activities.

The golden welds shall be 100% inspected by radiography, ultrasonic testing and magnetic particles and the connecting spool shall have been hydrotested to the design code requirements prior to be welded in place.

When different sections are connected by flange or connector, a final leak test or hydrotest shall be performed. If all the sections have been successfully hydrotested for 24h, then a leak test of 4 hours shall be performed at the hydrotest pressure. If a section has not been hydrotested for 24h, then the final hydrotest will last 24h.

The applied hydrotest pressure shall be in accordance with the design code and the Test Data Sheet in the PPS (Particular Project Specification). The test pressure shall be measured at the highest point of each section, making sure that the maximum local pressure does not cause the



hoop stress to exceed the specified minimum yield stress (SMYS) of the pipes during the pressure test.

Temporary items, such as pig traps and spools, shall be designed for the test pressure and pressure tested separately at a higher pressure, prior to being used.

No test shall be started before the hydrotest procedure and the Test Pack have been approved by Company. The tests of pipelines, risers and associated piping are to be approved and witnessed by Company, and shall appear as Hold Point in the project Quality Plan.

5. Engineering studies

5.1 Land Pipelines

The PPS shall give all the details necessary to the preparation of the hydrostatic test procedures. The PPS shall include a Test Data Sheet, indicating the name of the line, or section of line, the owner of the line, the overall length of the pipeline, the detailed description of the part of the line to be tested, the outside diameter(s), the steel grades, the various thicknesses, the design pressure, the test pressure, and the battery limits. It shall define the test pressures of the various sections all along the route of the pipeline, to take into account the various elevations of the pipeline and the subsequent hydrostatic heads.

The test shall be performed with the pipeline installed inside its trench, either ready to be covered or already covered.

5.2 Offshore Pipelines

For offshore pipelines demonstrating important variations of the elevation profile - typical cases being export lines from deepwater fields, or deepwater systems connecting subsea units to floating supports - the Engineering Study shall aim at reducing the amount of separate testing of sections, taking into account specific requirements for keeping the pipeline valves out of the pre-commissioning activities.

The PPS shall give all the necessary details for the preparation of the hydrostatic test procedures. The PPS shall include a Test Data Sheet, with the name of the line, or section of line, the owner of the line, the overall length of the pipeline, the detailed description of the part of the line to be tested, the outside diameter(s), the steel grades, the various thicknesses, the design pressure, the test pressure, and the battery limits.

For offshore pipelines, the recorded pressure shall be corrected of the hydrostatic head between the mean sea level and location of the pressure measuring device.

6. Safety

During the hydrostatic test, no work shall be performed on or near the pipeline or on or near the risers at both ends of the pipeline.

For inland pipelines, a safety distance of 40 m (2 x 20 m) along the right of way must be observed.

For offshore pipelines, safety distances on platforms must be evaluated on a case by case basis and then approved by Company.

At the pipe ends, a restricted access area shall be materialised with warning tape and safety warning signs. Test cabin shall be located at a minimum of ten meters from the pressure head.