Rigid flowline and riser systems

CONSISTENT AND RELIABLE DELIVERY OF CRITICAL INFRASTRUCTURE
Subsea 7 is a global leader in the delivery of offshore projects and services for the evolving energy industry.

We create sustainable value by being the industry’s partner and employer of choice in delivering the efficient offshore solutions the world needs.

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- How we deliver
- We are different
- Our product portfolio
- Rising from the deep
- Driving advances in welding
- The installation experts
- Globally capable

Who we are

Relationships
- Creativity
- Sustainability
- Innovation
- Collaboration
- Integrity

Why our clients choose us

- Safety
- Integrity
- Sustainability
- Performance
- Collaboration
- Innovation
- Culture
- Creativity
- Relationships
- Reliability
- Solutions

Rigid flowline and riser systems

Rigid flowlines and risers are the veins of offshore oil and gas developments. Some of these pipelines transport high pressure water and chemicals to keep the hydrocarbon reservoir alive, while others transport the produced hydrocarbons from the bottom of the ocean to the land where they create energy and products that the world needs.

Subsea 7 offers an extensive portfolio of high performance and cost-effective flowline systems to enable optimal field architecture. Our focus is to ensure reliable and economic flow of well streams from reservoir to the receiving facility, over increasing distances, without costly host modifications.

Flowlines and risers are fabricated from carbon steel, corrosion resistant alloys (CRAs) or composite materials using the technological advances in corrosion resistance offered by non-metals.

To maintain the flow of fluids through these pipelines, insulation is sometimes required to protect the hydrocarbons from the cold of the oceans. Pipes can be fabricated with an inner insulated Pipe-in-Pipe, or a double-wall which can be heated up to keep the valuable fluids within.

Solution-focused products

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We are different

The full value of Subsea 7’s rigid flowline and riser offering can be realised through early engagement from the concept stage. Our pipeline products form an integral component of the field development plan and can enable optimisations in topside design as well as subsea.

How we deliver

Effective FEED ensures an optimal solution that meets clients’ new.

Our passion for simplification sees us apply automation technology to apply to local projects around the world. We have a culture of continuous improvement. At our Global Technology Centre we see us apply automation technology to apply to local projects around the world. We have a culture of continuous improvement. At our Global Technology Centre we capture lessons from all our projects and improve business processes – improving accuracy, reducing lead time and lowering cost.

Culture

Global team with expertise, passion and commitment to deliver.

• Drive a culture of continuous improvement.
• BE the first contractor to develop and deploy the Pipe-in-Pipe lateral buckle control.
• We are the only contractor to offer oil field installation vessels.
• We operate an in-house pipeline welding service to ensure schedule certainty and the right high-quality welders.

We are a leader in corrosion-resistant pipelines, using either fabricated pipelines, using low-cost vessels.

Creativity

Ability to innovate through technology, processes and partnerships.

• BE the first contractor to develop and deploy the Pipe-in-Pipe lateral buckle control.
• Our approach for Engineering Criticality Assessments (ECA) is continually evolving.

We are industry leaders in corrosion-resistant pipelines, using low-cost vessels.

Relationships

Working and learning together to achieve success for all.

• Being transparent and open across our pipeline delivery allows a one-team approach with clients encouraged to be part of the solution.
• We want to partner with clients to develop new technologies and products ensuring they are best for industry needs and timely.
• Our passion is to deliver solutions that add value.

We are different

Pipeline products and teams that add value.

• We have qualified and installed the world’s first all polymer liner, LinerBridge® for polymer based pipelines.
• Subsea 7 is the world leading provider of subsea polymer lined pipelines, specifically designed to handle deepwater production.

Solutions

Client-focused mindset to create the right solutions.

• Industry leaders in corrosion-resistant pipelines.
• Largest portfolio of deepwater new systems in the world.
• We are the only contractor to offer oil field installation vessels.

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We are industry leaders in high pressure high temperature (HPHT) solutions, with qualified personnel and welding solutions, variable U-value risers, and pre-insulated Pipeline Bundles systems.

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Our product portfolio

Extensive portfolio of high performance and cost-effective flowline systems to enable optimal field architecture.

We focus on enabling the reliable and economic flow of well streams from the reservoir to the receiving facility over increasing distances without costly host modifications.

PIPELINE BUNDLE

A solution that integrates multiple flowlines and control systems within a single steel carrier pipe and avoids individual monopods, with manifold structures at each end. Subsea 7 has deployed a range of Pipeline Bundles. Following functional testing, the subsea end is first launched and transported to its offshore location using the Controlled Depth Tow (CDT) system. We have installed over 40 Pipeline Bundles to date.

Subsea 7 has developed a Pipeline Bundle recall concept allowing temporary or permanent recall, repositioning or reconfiguration of the Pipeline Bundle. The pipeline bundle can be retrieved and repositioned at any location along its journey from the wellhead to the host facility. This enables simplification of field procedures where needed, to allow cost effective repair, maintenance and coating systems, qualifying up to 100mm thick injection moulded polypropylene, and high performance and XSAMS field joint components. We work with clients to optimise repair procedures when needed, to allow cost effective service repair, to select cost efficient solutions.

PIPE-IN-PIPE (PIP)

A solution to improve the thermal performance of marginal fields through the installation of high performance insulation coatings. We have worked with a variety of suppliers including the world’s deepest open loop electrical heating systems since 2007 where operators will benefit from operational simplicity and reduced power requirements and lower costs.

The single pipe is fabricated from solid or clad pipe. A more cost-effective corrosion resistant pipeline solution as an alternative to traditional Swagelined or polymer lined pipes. Subsea 7 has since deployed MLP in the challenging, deepwater Sapinhoá-Lula NE field development, Brazil. Subsea 7 qualified MLP for use in the subsea corrosion system for water injection applications where flow assurance is not a concern. MLP offers clients a 50-year design life, reduced weight, enhanced flow, lower OPEX, reduced risk and where flow assurance is not a concern.

WET INSULATED PIPE

A solution to improve the thermal performance of offshore systems by installing pipe insulation directly to the host facility. This enables simplification of field procedures where needed, to allow cost effective repair, maintenance and coating systems, qualifying up to 100mm thick injection moulded polypropylene, and high performance and XSAMS field joint components. We work with clients to optimise repair procedures when needed, to allow cost effective service repair, to select cost efficient solutions.

DIRECT ELECTRICAL HEATING (DEH)

A solution which enables the deployment of来临有低流多高层高离温一般性能的图片间隔温度场的存储, dynamic ARrival Temperature (DART). This technology is specifically suited for pipelines and risers, creating an electrical loop from a current generator located on the topsides of the facility. This enables simplification of field procedures where needed, to allow cost effective repair, maintenance and coating systems. The system can operate either in a passive or an active mode. The heat-traced technology can be applied to all pipe installation, at high temperatures and at permanent operation. It can significantly lower power requirements and lower costs than DEH systems.

ELECTRICALLY HEAT TRACED FLOWLINE (EHTF)

A solution which can be significantly enhanced by insulation. When using high performance insulation the developed EHTF system has a self-regulating temperature and ensures that the production loop often required to enable wax or hydrate appearance temperature to maintain flow assurance properties. EHTF technology can be applied to any pipe, in either flow, non-flow or high pressure high temperature applications, allowing the subsea end to be connected to both ends of the pipeline. The heat-traced technology can be applied to all pipe installation, at high temperatures and at permanent operation. It can significantly lower power requirements and lower costs than DEH systems.

SWAGELINING® POLYMER LINED PIPE

A cost-effective corrosion resistant pipeline solution for water injection service. It is a single Pipe, Swagelined™ system offering a 50 year design life, including thermal insulation, semi-thick or thick EHTF insulation, complex cold start and freeze protection through suitable fabrication order of magnitude. Subsea 7 offers a range of solutions to expand the utility of Swagelining® to facilitate integration of dynamic ARrival Temperature (DART) and Swagelining® systems.

Subsea 7’s innovative approach to enhance the reliability of subsea flowlines ensures world first implementation, strong technical and operational know-how for the installation and application of the system.

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A digital future
With the adoption of automation, artificial intelligence and machine learning we plan to improve quality and productivity. We will have the ability to remotely review operations and processes allowing us to improve availability of skilled resources, improve training techniques, aid familiarisation, increase equipment uptime and reduce safety risks.

Global Pipeline Welding Development Centre
Subsea 7’s Global Pipeline Welding Development Centre serves as a technical authority for welding and materials enhancements to all Subsea 7 fabrication bases globally, greatly reducing client uncertainty and risk. The centre incorporates 19 welding bays and allows us to perform realistic pre-production welding trials, operator training and research and development activity.

A leader in the delivery of Steel Catenary Risers
Subsea 7 are industry leaders in the design, fabrication and installation of modular and robust steel catenary riser systems. Our world-class technical resources include:

• First application of mechanically lined pipe (MLP) in a dynamic case for the Sapinhoá-Lula NE Project.
• In-progress qualification of first polymer lined SCR to offer a corrosion-resistant light-weight riser using our Swagelining technology.
• 24 CRA SCRs installed using the reel-lay installation method.
• Industry-leading in-house welding solution has enabled successful SCRs installed with zero automated ultrasonic testing (AUT) rejects.
• In-house design expertise offering complete SCR design optimisation including strakes for vortex induced vibration (VIV) and buoyancy modules.
• Robust design for long term SCR wet storage requirements disconnecting FPSO schedule.
• Installation of first novel SCR on reel-lay vessel without anchor to control the SCR touchdown point offering significant schedule optimisation.

Rising from the deep
Subsea 7 provide deepwater and ultra-deepwater riser technology tailored to the field characteristics including extreme water depths, harsh environments, low constraints or hydrocarbon composition.

Coupled Risers
Advantages: cost-efficient, single riser product, minimal components, cost-optimisation ability
- Steel Catenary Risers (SCRs)
- Weight-Balanced SCR
- Steel-Lap-Wire Risers

De-coupled Risers
Advantages: long-term load, position and orientation stability
- Single Hybrid Risers
- Hybrid Riser-Tower
- Buoy-Supported Risers
- Gimbal Joint Risers

High-pressure, high temperature
Riser designs for high pressure and high temperature (HPHT) field developments, are driving a trend for fewer welds using welding capabilities or high strength steels. Subsea 7 offers a viable cost-efficient solution for X80 pipe up to 45mm wall thickness and a wide selection of welding processes to reduce welder fatigue and improve schedule flexibility.

Leading the industry in corrosion resistant pipelines
Subsea 7 led the industry by qualifying Mechanically Lined Pipe (MLP) in 2010 for the challenging, deep water Sapinhoá-Lula NE project in Brazil. Furthermore, in 2016 Subsea 7 acquired Swagelining, the world’s leading polymeric lining specialist for subsea pipelines and has since continued with development of the LinerBridge® connector system and, conducting research and development into expanding the application of pipe-in-pipe, pipelines-in-liner and dynamic flex service, to key installations and infield service for various hydrocarbons.

Driving advances in welding and materials
Our in-house world-class welding facility develops welding and materials solutions for use in our pipeline fabrication bases and vessels around the world.
The installation experts

Subsea 7 installation experts have delivered many world-firsts, reducing the cost of field developments, improving predictability and enabling the world’s most complex projects.

Pioneering Residual Curvature Method (RCM) for pipeline lateral buckle control

Subsea 7 pioneered the key method in 2010 using the pipe strengthener on the man-made vessel to create local curvature zones in the pipeline to by engineered pipe surveys on the seabed. This method offers a new cost solution to manage lateral/pipeline buckling caused by thermal expansion of the pipeline when in operation. RCM has been successfully used for three North Sea field developments with other plans globally.

Industry leading engineering criticality assessment – offering optimised schedules while maintaining safety

Since 2008 Subsea 7’s approach to Engineering Criticality Assessment (ECA) by finite element analysis (FEA) to cover partially under-matched welds has gone beyond commonly accepted industry boundaries. Our internal research and development team has investigated aspects such as the safety factor for fatigue crack growth, tearing limit through lateral pipeline buckling caused by thermal expansion of the pipeline when in operation. RCM has been successfully used for three North Sea field developments with other plans globally.

Solution providers for the non-standard pipeline

Subsea 7’s installation experts are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.

Subsea 7 has installed offshore pipelines using spiral wound girth welds and nested ring welds to improve joint coating systems. Subsea 7 has also improved post-weld allowable defect size and minimize weld repair rates, providing clients with ensured reliability.

Cost optimisation enabled through expert knowledge

Subsea 7 can install pipelines using more cost-effective vessels while maintaining safety factors through industry-leading installation expertise.

This expert knowledge and in-depth understanding has enabled an increase of weather operation hours per pipeline and deeper water to be realised from existing areas offering lower-cost solution to our clients.

Globally capable

Subsea 7 has an extensive track record of safe and successful installation of rigid pipelines in shallow and deepwater fields throughout the world.

Industry leading pipeline end termination (PLET) installation experience and capabilities.

Over 450 pipeline structures experience and capabilities.

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