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.

Contents
Rigid flowlines and riser systems 01
How we deliver 02
We are different 03
Our product portfolio 04
Rising from the deep 05
Driving advances in welding 07
The installation experts 08
Globally capable 09

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 (CRA) or composite materials using the technological advances in corrosion resistance offered by non-metallics.

To maintain the flow of fluids through these pipelines, insulation is sometimes required to protect the hydrocarbons from the cold of the oceans. Pipelines can be coated in high specification insulation or a double wall pipe-in-pipe can be fabricated like an insulated flask. In extreme requirements heating wires can be installed in the double-wall which can be switched on to heat up the valuable fluids within.

Solution-focussed products
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 (CRA) or composite materials using the technological advances in corrosion resistance offered by non-metallics.

Subsea 7’s pipelay fleet is capable of delivering solutions in both shallow and ultra-deep water using the most technically and cost-effective installation methods from reel-lay to S-lay, J-lay and Towed Pipeline Bundles.
How we deliver

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.

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.

We are different

Pipepline products and teams that add value.

We are different

Pipepline products and teams that add value.
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.

1. PIPELINE BUNDLE
   A solution that integrates multiple flowlines and control systems within a single steel carrier pipe, with manifold structures at each end. Subsea 7 provides system designs and assures project execution. Following full functional testing positions, the Pipeline Bundle is then launched and transported to its offshore location using the Controlled Depth Tow Method (CDTM). We have installed over 40 Pipeline Bundles to date.

2. PIPE-BACK PIPELINE
   A solution to improve the efficiency of oilfields by allowing the products to be delivered to manifold structures at each end.

3. WET INSULATED PIPE
   A solution to improve the thermal performance of a tube by attaching a high performance insulation coating. We have worked with a variety of suppliers to develop and deliver various insulation coatings, qualifying up to 100mm thick injection moulded polypropylene, and coating systems, offering unrivalled performance.

4. PIPE-IN-PIPE (PIP)
   A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology can be applied with all pipe metallurgies, at high temperatures and across all environments. The technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

5. DIRECT ELECTRICAL HEATING (DEH)
   A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

6. ELECTRICALLY HEAT TRACED FLOWLINE (EHTF)
   A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

7. SINGLE PIPE
   A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

8. POLYMER LINED PIPE
   A more cost-effective corrosion resistant pipeline system for pipelines and risers. It offers clients a safe, non-toxic and reliable material option.

9. SWAGELINING
   A mechanical bore reinforcement system to repair leaks in pipelines safely and cost-effectively. It is used in offshore environments to repair pipelines where the cost of shutting down the facility is prohibitive.

10. PIPE IN PIPE WET INSULATED SYSTEMS
    A system that integrates multiple flowlines and control systems within a single steel carrier pipe, with manifold structures at each end. Subsea 7 provides system designs and assures project execution. Following full functional testing positions, the Pipeline Bundle is then launched and transported to its offshore location using the Controlled Depth Tow Method (CDTM). We have installed over 40 Pipeline Bundles to date.

11. PIPE-BACK PIPELINE
    A solution to improve the efficiency of oilfields by allowing the products to be delivered to manifold structures at each end.

12. WET INSULATED PIPE
    A solution to improve the thermal performance of a tube by attaching a high performance insulation coating. We have worked with a variety of suppliers to develop and deliver various insulation coatings, qualifying up to 100mm thick injection moulded polypropylene, and coating systems, offering unrivalled performance.

13. PIPE-IN-PIPE (PIP)
    A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology can be applied with all pipe metallurgies, at high temperatures and across all environments. The technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

14. DIRECT ELECTRICAL HEATING (DEH)
    A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

15. ELECTRICALLY HEAT TRACED FLOWLINE (EHTF)
    A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology can be applied with all pipe metallurgies, at high temperatures and across all environments. The technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.

16. SINGLE PIPE
    A solution for simple field developments of subsea fields through efficient and cost-effective flow assurance properties. EHTF technology is specifically suited to high pressure high temperature fields where operations will be operated from operations flexibility by adjusting the production fluid arrive temperature at the host facility.
Rising from the deep

We have one of the largest portfolios of deepwater riser systems in the world.

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.

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.

A leader in the delivery of Steel Catenary Risers Subsea 7 is a leader in the design, fabrication and installation of reliable and robust steel catenary riser systems. Our world-class facilities and technical succession enable us to:

- Perform qualification of novel welding technologies.
- Give confidence of first-pass perfection for SCRs to offer a corrosion-resistant lightweight solution using our latest technological advances.
- Use 2G GTA standards validated using the two-leg installation method.
- Industry-leading in-house welding solution has enabled multiple SCRs fabricated with zone automated ultrasonic testing (AUT) rejections.
- 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 end SCR on reel-lay vessel without anchor to control the SCR touchdown point offering significant schedule optimisation.

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 future digital

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, increase equipment uptime and reduce safety risks.

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

A leader in the delivery of Steel Catenary Risers Subsea 7 is a leader in the design, fabrication and installation of reliable and robust steel catenary riser systems. Our world-class facilities and technical succession enable us to:

- Perform qualification of novel welding technologies.
- Give confidence of first-pass perfection for SCRs to offer a corrosion-resistant lightweight solution using our latest technological advances.
- Use 2G GTA standards validated using the two-leg installation method.
- Industry-leading in-house welding solution has enabled multiple SCRs fabricated with zone automated ultrasonic testing (AUT) rejections.
- 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 end SCR on reel-lay vessel without anchor to control the SCR touchdown point offering significant schedule optimisation.

High pressure, high temperature

Riser designs for high pressure/ high temperature (HPHT) field developments, offering a robust but low profile pipe angling capability or high strength steels. Subsea 7 offers a high qualified multi-flex riser and umbilical solution for HP/HPHT and up to 15000 feet thickness fabricated (fully) with our in-house qualified qualification for HPHT mechanically tied pipe.

Leading the industry in corrosion resistant pipelines

Subsea 7 is the only company qualified with linepipe with X80 linepipe in 36” for the challenging, deep water Sapinhoá-Lula NE project in Brazil. Furthermore, Subsea 7 acquired Swagelining, the world’s leading polymer lining specialist for subsea pipelines and has since then worked with qualification of this knowledge in connector systems and is conducting research and development into expanding the application of such solutions to further offshore pipeline applications. Subsea 7 provides a full scale design, engineering and installation service, from the installation and in-service corrosion protection.
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 method in 2012 using the pipe straightener on the reel-lay vessel to create local curvature in the pipeline to lay engineered pipe curves on the seabed. This method offers a low-cost solution to manage late-pipeline building caused by thermal expansion of the pipeline when in operation. RCM has been used successfully for several North Sea field developments with others planned globally.

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

Since 2018 Subsea 7 has approached its Engineering Criticality Assessment (ECA) by finite element analysis (FEA) to cover partially-under-matched welds has gone beyond commonly assessed areas such as: the weld toe for fatigue crack propagation, tearing limit through partially under-matched welds has gone beyond commonly assessed aspects such as: the weld toe for fatigue crack growth, tearing limit through partially under-matched welds. An in-depth understanding has enabled an increase of weather windows, favours pipelines and deeper water to all be realised from existing assets offering lower cost solutions to our clients.

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 windows, favours pipelines and deeper water to all be realised from existing assets offering lower cost solutions to our clients.

Solution providers for the non-standard pipeline

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

Subsea 7 has installed offshore pipelines using spiral wound pipes for the first time that corrosion-resistant alloy clad pipes were used in a dynamic SCR application.

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.

- 38km of polymer lined water injection flowlines, 12km of polymer lined water injection flowlines.
- 16.1-inch x 12-inch. First reeled installation of 16.1" diameter pipe in the field.
- Over 450 pipeline structures for clients including Shell, Equinor, Wintershall Dea, Woodside, and others planned globally.
- First project to incorporate Swagelining technology in Europe, 42km of 20" concrete coated pipelines were used in a dynamic SCR application.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.
- Subsea 7’s installation capability means we are the partner of choice to ensure reliable and consistent delivery of non-standard pipelines.