Offshore platform/facility provider

Your field development provider able to deliver all types of offshore fixed and floating facilities through our integrated network of regional locations
Technip profile

Technip is a world leader in project management, engineering and construction for the energy industry.

With a workforce of 40,000 around the world, we constantly offer the best solutions and most innovative technologies to our clients to meet the world’s energy challenges.

We operate in three main businesses:

**Subsea**

In subsea hydrocarbon development, Technip’s activities include the design, manufacture and installation of rigid and flexible subsea pipelines and umbilicals. Thanks to its portfolio of technologies and industrial and operational assets, Technip offers a unique vertically integrated model in the industry.

The Group has 3 flexible pipe manufacturing plants, 4 umbilical production units, 9 logistics and pipeline assembly bases, and 1 construction yard. Technip’s worldwide leadership is supported by a modern fleet of vessels for subsea construction, pipelay development (rigid and flexible pipes using S-Lay, J-Lay or Reeled technology) and heavy lift applications.

**Offshore**

In the Offshore business segment Technip performs engineering, procurement, construction, installation, commissioning and the refurbishment/upgrading of offshore facilities for the oil and gas industry.

Technip provides these services for fixed platforms in shallow water with conventional sub-structures and self-installing platforms such as the TPG 500 and for deepwater facilities including Spar, semi-submersible, TLP, FPSO and FLNG units. Technip is a world leader in floatover installation of topsides and its R&D effort is focused technology transfer for local content and new frontier areas such as ultra-deepwater and the Arctic.

**Onshore**

Technip covers the full range of onshore facilities for the oil and gas chain, petrochemicals and other energy industries (nuclear, renewables including biofuels and offshore wind). It holds many proprietary cutting-edge technologies and is the leader in the design and construction of LNG and gas treatment plants as well as ethylene, hydrogen and syngas units.

Technip is also one of the key actors in refining and petrochemical units, and has developed a leadership position in the fertilizer industry. Moreover, the Group is very active in non-energy activities such as mining and metals, life sciences, buildings and infrastructures.
Technip is structured to act as a field development provider throughout all phases of an offshore project.

Starting with the coordinates and a fluid assay of your reservoir, we work with you to determine the most economical way of bringing our Clients’ hydrocarbons to market. Technip has an extensive track record of delivering conventional and innovative infrastructure to the energy business and our broad knowledge of development options and local know-how help you achieve your ambitions.

Technip’s wholly-owned sister company Genesis specialises in creating matrices of potential development architectures and then screening until the optimum architecture is established. Using their ADEPT field development program, multiple platform, pipeline and onshore receipt facility options can be rapidly compared in terms of CAPEX, OPEX and risk profile during the field development planning. Genesis has the capability to take large developments through to FEED and execute small project through to produce. Technip’s strength is in project delivery but also regularly performs field development planning studies for very large projects. Both Genesis and Technip offer brownfield services during the production and life extension phases. Both organizations can advise on abandonment options.
Health and Safety
For Technip, the health and safety of our people is a core value and an absolute commitment. During all project phases, from design through construction and offshore operations, safety is at the heart of all our activity. Our “PULSE” HSE program has won many awards and has been successfully implemented by our construction partners and clients. Safety in design is achieved through training, R&D, lessons learnt and knowledge management.

Quality
As the scale and complexity of offshore projects increases, so does the importance of maintaining the highest degree of Quality in our work. Technip has a series of rigorous quality procedures that we implement on all our projects. For specific regulatory regimes, we may apply additional quality verification systems to ensure compliance (eg NORSOK / PSA).

Project delivery
Technip has an unrivalled Project Management capability able to deliver all types of offshore fixed and floating infrastructure through our integrated network of regional locations. Working with common systems and procedures, our project teams are able to draw on expertise and resources from other centres to execute large and complex field developments. Where national content is a strong driver, our regional offices are often capable of performing major projects autonomously or with knowledge transfer of specialist technologies from other centres. All execution centres have access to Technip’s Global Procurement network.

SERVICES OFFERING AT A GLANCE

Floating platforms
- FLNG
- FPSO
- Spar
- TLP
- Semi

Fixed platforms
- Conventional jackets (with lift or floatover installed topsides)
- Gravity base substructures (with lift or floatover installed topsides)
- Self- installing platforms
- Artificial islands
Floating platform design

Floating platforms require specialist engineering tools to optimise and validate the design. Technip invests heavily in developing design tools for all areas of its activity. We have developed and validated our own software for calculating the global motions and performing the basic design of our Spar platforms. This software package called IPAD (Integrated Platform for Analysis and Design) has been extended to cover all floating platform types and can be used to perform floater design at any of our regional offices with a minimum of training. This approach has now been used on several projects to transfer knowledge and enhance national content in an efficient manner.

An analogous software package has been developed for risers named IRAD (Integrated Riser Analysis and Design). We have become a leader in CFD (Computational Fluid Dynamics) simulation of floating platforms to the extent that we have now developed a virtual wave tank. Indeed the power of CFD to simulate at full scale has enabled Technip engineers to better understand complex wave and current behaviour such as run-up / green-water effects and VIM (Vortex Induced Motion). CFD has enabled us to develop our own low motion semi-platform design capable of supporting dry trees.

Adaptation of Onshore process for Offshore

Technip has a strong track record of successfully taking complex onshore processes and integrating them into offshore platforms. Examples include LPG extraction on the Nkossa floating production platform and a full gas treatment plant on the Elgin TPG 500 jack-up platform. Technip can harness the synergies between its onshore and offshore disciplines, such as between onshore LNG and offshore FPSO design, to enable the new generation of FLNG projects.

Subsea processing

As offshore production moves into deeper water there is an increasing need for subsea systems to process the fluids to reach a host platform or to shore. We have developed a competency in subsea processing so that we can evaluate all the relevant options and recommend the optimum subsea architecture and platform configuration to our clients. We are investing in R&D to evaluate promising new technologies that could be applied as part of a subsea development (eg. the Twister supersonic dehydration system).
Technip is the reference company for FLNG being the leader on the world’s first two major FLNG projects. FLNG is a ground breaking new fusion of onshore and offshore technologies that enables the economic development of large remote gas reserves, where pipeline export of gas to an onshore LNG plant is uneconomic or a high risk option. These mega projects require collaboration between the technical skills of onshore LNG plant design and the marinisation of facilities required for offshore platforms. FLNGs are amongst the largest offshore floating structures and hence require experienced design and fabrication partners. Technip is leading several JIP and internal R&D initiatives to model LNG spillages and protect the FLNG vessel from cold spill and fire explosion damage.

For benign environments the cryogenic product can be offloaded onto an LNG carrier that moors alongside the FLNG vessel using a series of offloading arms comprising of hard pipe and swivel joints. For harsh environments, it is unsafe for the LNG carrier to moor alongside the FLNG so tandem offloading (eg stern-to-bow) is required to maintain a significant separation between the two vessels. Technip has a qualified aerial hose solution for tandem offloading of LNG using cryogenic flexible flowline design.

**Our main references**

- Shell Master Agreement for the design, construction and installation of multiple FLNG facilities over up to 15 years
- Shell generic FLNG FEED
- Shell Prelude FLNG FEED and EPC
- Shell: agreement to strengthen FLNG collaboration
- Petronas FLNG1 (Labuan) FEED and EPC
- Petrobras FLNG FEED and winner of the design competition
- A number of conceptual and FEED studies completed or underway
Technip, working with its construction partners has delivered some of the largest FPSOs in the world. FPSOs enable offshore production and storage of oil with export by shuttle tanker where pipeline export is uneconomic or technically challenged (e.g., ultra-deep water). FPSOs utilise onshore processes adapted to a floating marine environment using skills in the marinisation and packaging of facilities. They are capable of supporting large topsides and hence large production capacities. In benign environments FPSOs can be spread moored but in moderate to harsh sea states they have external or internal turret mooring respectively. Where an FPSO is turret moored and weather vanes, a flow transfer system is required to allow fluids from the subsea wells to pass onto the deck of the FPSO for processing.

**KEY POINTS**

- Technip and its construction partners have delivered some of the world’s largest FPSOs
- Well suited to oil field developments where subsea trees drilled by MODU are appropriate
- Wide range of water depths
- Offshore storage and export of oil by shuttle tanker – no need for oil export pipeline

**Our main references**

- Total Girassol FPSO
- Total Dalia FPSO
- Total Akpo FPSO
- Inpex Ichthys FPSO
- Petrobras P58/P62/P70/P76
Technip is a global leader in Spar platforms having built and delivered 15 (with 2 more in construction) out of 18 built Spar platforms to-date.

**Different solutions**

The Spar has been developed from the original cylindrical Classic Spar through the Truss Spar, the Cell Spar, the Arctic Spar and Spar with storage. The Spar is a low motion floater that can support full drilling with dry trees or with tender assist and flexible or steel catenary risers. The Truss Spar can be configured with condensate storage appropriate for the development of a remote gas field. The Classic Spar can be configured with larger storage volumes more appropriate to oil field developments where a low motions floater is required (e.g., for drilling and production). The Spar topside is installed offshore either by heavy lift or floatover.

**Arctic Spar**

Technip has also developed two different Spar designs for the Arctic: one where sheet ice conditions predominate and one where icebergs represent the only ice threat. In both cases, they have detachable risers and moorings.
Excellence in delivery

As a result of our history in Spar platform experience and expertise in Project Management, Technip’s on time execution has become the gold standard in Spar delivery certainty.

Our main references

- Murphy Kikeh: the world’s first Spar built in Malaysia at MMHE and the world’s first Spar with catamaran floatover topsides, a prime example of national content
- Shell Perdido: the world’s deepest production Spar in 2,382 m water depth
- Anadarko Lucius
- Anadarko Heidelberg
- Statoil Aasta Hansteen: the world’s first production Spar with product storage and the world’s first Spar within the Arctic Circle
Strategic partnership

Technip, through its hull design affiliate TMH (a joint venture between Technip and MHB, set up in 2011) and fabrication partner MMHE (Malaysia Marine and Heavy Engineering Sdn Bhd) is delivering the Malikai TLP to Shell offshore Malaysia.

The strategic partnership of Technip, TMH and MMHE is just one example of how Technip can facilitate local objectives for both operators and host countries.

Technip’s TLP design

The TLP with its vertical tendon moorings that eliminate heave is an appropriate platform for deepwater drilling and production in water depths up to ca. 1,500m. The TLP can be configured with full drilling or with tender assist and is generally a dry tree unit. The TLP has a shallow draft and its topside can be integrated onto the substructure at quayside and therefore large topsides can be accommodated in a cost effective manner.
Technip has designed its own semi-submersible platform. It has HVS properties, i.e., Heave and Vortex-induced-motion Suppression and has two variants: wet tree or dry tree compatible. The wet tree semi has reduced motions compatible with steel catenary risers (SCRs) whereas the dry tree version has a greater draft, additional heave plates and is capable of supporting dry trees.

The Technip semi development has only been possible with the extensive use of Computational Fluid Dynamics (CFD) to optimise the hull form for reduced motions prior to verification in a model basin. The Technip semi has all the attributes of a conventional semi, i.e., simplicity of construction, moorings and low cost, but with the benefits of low motions that enable it to perform in an equivalent manner to a Spar or TLP. With its column step design, the Technip semis are exceptionally stable at shallow draft (quayside), and in the transition zone during ballasting to operating draft. Its topside can be integrated onto the substructure at quayside and therefore, like the TLP, large topsides can be accommodated in a cost-effective manner. Alternatively, the semi topsides can be installed by floatover (such as with the Petrobras series of platforms: P52, P51, P56).

**Key Points**

- Well suited to oil field developments where subsea trees drilled by MODU are appropriate
- Wide range of water depths
- Full drilling and large topside capability
- Technip has its own novel design of low-motion semi that can accommodate dry trees

**Our main references**

- Petrobras P52/P51/P56
Technip has a long track record of delivering fixed platforms.

There are several types of fixed platforms:

- Large conventional platforms with pile steel jackets where the topsides are installed by heavy lift vessel or floatover (e.g., CTOC Cakerawala and Exxon Mobil East Area both with 18,000-tonne topsides)
- Small conventional platforms installed by small crane vessel (e.g., RWE Cavendish)
- Steel Gravity Base Structures (GBS) platforms, generally with floatover topsides (e.g., Petronas Turkmenistan block 1 and Chevron Wheatstone)
- Large self-installing platforms (e.g., TPG 500 production jack-ups on Harding, Elgin, and Shah Deniz up to 30,000 tonne topsides)
- Small self-installing platforms (e.g., Burlington Calder)

Our main references:
- Chevron Wheatstone EP
- Statoil Valemon topsides EP
- Dong Hejre jacket and topsides EPC
- Total Martin Linge topsides EPC
Technip has a range of different platform types that are suitable for offshore developments in the ice-prone Arctic or sub-Arctic regions. For shallow water, such as in the North Caspian, Technip has developed a conical steel foundation to support large topsides and provide good performance in drifting sheet ice conditions as an alternative to conventional artificial islands.

Technip, together with Cervval and BV, has developed a new ice-modelling simulation program. The program is unique in the Arctic industry in that it uses a multi-program simulator which is able to cope with the complexity of calculating the properties for the ice sheet and for each ice fragment that results from contact with the structure or from collision with other ice rubble particles. The program allows platform structures to be optimised, to minimise ice loadings and ice rubble build-up, prior to final design verification in an ice test basin.

KEY POINTS

- Arctic platforms require winterised (enclosed) topsides which call for a specialised approach to safety design
- Through its fleet of subsea vessels, Technip has extensive experience in operating in remote sub-Arctic locations
- Technip can evaluate various platform designs in ice-prone areas and advise on optimum selection from a technical, commercial and HSE perspective

Our main references

- Cairn Energy Offshore Southern Greenland field development option screening
- SDAG Shtokman FPU - FEED
- Total Kalamkas Sea Project Concept Study
- Yamal LNG - Large onshore modules using offshore concepts
- Statoil Aasta Hansteen Spar, the world’s first Spar within the Arctic Circle and the first production Spar with storage
Technip is also a leader in floatover operations and has performed several world firsts. Technip developed the jack assisted set-down (Unideck) method to enable topsides to be installed onto fixed jackets in West Africa’s challenging long period swell environment. Technip has extensive experience of topside mating onto floating structures such as semi hulls (eg Petrobras P52, P51, P56) and a Spar hull using catamaran barges (eg Murphy Kikeh).
Subsea processing and field life extension

Subsea processing
As field developments move into increasingly deeper water depths, subsea processing becomes essential for lifting the reservoir fluids to surface, or shore, for further treatment. Subsea processing, which started with booster pumping and basic separation of gas and liquid phases, is becoming increasingly more complex. Subsea gas compression systems are in the execution phase and subsea factories are predicted for the future. Technip has the expertise to evaluate the available options for subsea processing, their associated risks and the benefits they can offer in terms of riser configuration, reduced platform topsides, smaller export pipelines and reduced onshore infrastructure. Being independent of any subsea processing equipment manufacturer, Technip is able to recommend the best available subsea processing technology appropriate to a specific offshore field development.

Post delivery opportunities
During the production phase of a field, opportunities may arise to improve the economic value of the development. This may be debottlenecking, if the reservoir deliverability exceeds original expectations, tying back other wells or fields to take advantage of excess processing capacity post plateau, or using enhanced oil recovery techniques to improve the recovery of fluids from an existing reservoir. Technip is building a strong capability in brownfield works drawing on its skills of designing, planning and executing large complex offshore construction, hook-up and commissioning projects.

Our main references
- Shell global Engineering Frame Agreement
- BP Engineering Services Program
- Marine Well Containment System
- International subsea field designs in the United States, India, Venezuela, Mexico, the UK etc.
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