Our business approach

Production Integrity Management

Technip's enhanced technology-based asset integrity services create superior value for businesses throughout the production life cycle.
Technip is a world leader in project management, engineering and construction for the energy industry.

With a workforce of 38,000 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.
By integrating acquisition, validation, processing, analysis and interpretation of data, we comprehensively monitor and inspect critical production assets. We then create operational recommendations and efficiencies that optimize operations and safety, as well as maintenance management. By integrating our services, we can provide complete solutions from a single point of contact.

Production Integrity has been expertly designed around an Asset Management System to deliver clear focus on operation, maintenance and integrity for the management of field assets.

As part of the Technip Group, our interpretation and analysis services are backed by extensive experience in design, manufacturing and construction. Technip’s track record in inspection, repair and maintenance (IRM) project management adds further value to our offer.

Production Integrity Value Chain

We offer a package of services across the complete range of the Production Integrity lifecycle:

- Monitoring & surveillance
- Acquisition & data management
- Risk-based inspection & interpretation
- Reporting & recommendations
- IRM operations
Today’s challenges

Risk reduction
A primary objective is to provide surveillance, monitoring technology and services to reduce the risk of failure and consequential harm to people and the environment.

Risk-based inspection and maintenance management
Through a risk assessment process, our expert teams identify integrity critical elements of the assets and their mode of failure. Risk-based inspection programs are then implemented, and inspection and maintenance plans are proposed to optimize functional availability of assets throughout their lifecycle.
**Optimizing production**
Production Integrity’s surveillance technologies are designed to monitor flow assurance and provide early identification of performance trends. Planned interventions are optimized, unplanned downtime events are mitigated and operational lifespan can be maximized.

**OPEX reduction**
Risk-based inspection programs, coupled with continuous surveillance and analysis will drive optimized operating conditions and reduce lifecycle costs.

**Maximizing long-term production**
Production Integrity’s experience and expertise contribute to prolonging the asset lifecycle through continuous surveillance of operating conditions and re-evaluation of key design parameters such as fatigue regime and corrosion problems.

**Project management approach to Production Integrity**
Through the development of integrated asset management systems of complex infrastructures and our experience of large projects management, we offer an integrated approach to operations and maintenance of field lifecycle.

Today’s new subsea challenges are driving the growing importance of Production Integrity
The three pillars of our market

Production Integrity offers a range of services across 3 principal sectors or asset infrastructure:

- Floaters, buoys & mooring systems
- Risers (rigids and flexibles), pipelines & umbilical’s
- Subsea flow assurance, subsea production systems

Across those 3 principal sectors or asset infrastructure, our services apply more specifically to 5 areas, each of which includes several items as described below:

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<th>Monitoring &amp; Surveillance</th>
<th>Acquisition &amp; Data Management</th>
<th>Risk-based Inspection &amp; Interpretation</th>
<th>Reporting &amp; Recommendations</th>
<th>IRM Operations</th>
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<tr>
<td>Products installations and commissionning</td>
<td>Data logging, conditioning &amp; QC</td>
<td>Risk-based inspection program</td>
<td>Specific engineering services*</td>
<td>Management of IRM operations (ROV &amp; AUVs)</td>
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<td>Inspection services</td>
<td>Data transfer via cable, radio or acoustic</td>
<td>Trends analysis</td>
<td>Recommendation for optimized operations</td>
<td>Coordination &amp; optimization of vessel programs</td>
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<td>ROV &amp; AUV support to monitoring</td>
<td>In-house data processing</td>
<td>Failure mode analysis &amp; predictive modelling</td>
<td>Planned maintenance &amp; interventions</td>
<td>Management &amp; maintenance of Global Information Systems (GIS)</td>
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We also offer transverse operations training throughout these 5 areas

* The engineering services we provide are transverse to our three principal sectors or asset infrastructure mentioned above. They cover software services, systems design & development, data analysis & compliance reviews, trends analysis, interpretation & reporting, inspection engineering & program management, data archiving & management.
Our services

Monitoring & surveillance
A range of proprietary systems that measure and monitor operational parameters, loading profiles and condition status on subsea equipment. These technologies are designed to be incorporated at equipment assembly time or retrofitted past equipment installation on site. ROVs and AUVs can be configured as survey and measurement hosts or data harvesting platforms.

Acquisition & data management
Data can be logged continuously or gathered periodically. Data streaming or harvesting can be achieved via dedicated cabling, wirelessly via fixed modems or by ROV/AUV platforms. Data is conditioned and processed by in house software. Services include identifying the location and condition of subsea infrastructure, surveys of surrounding environment and processing within a Global Information System (GIS).

Risk-based inspection & interpretation
We use our extensive network of engineering experts to provide risk based interpretation and trends analysis. Detailed engineering services can deliver failure mode analysis and predictive modelling. We provide design code and safety compliance checks.

Reporting & recommendations
We provide expert opinion and recommendations for corrective actions and maintenance programs. We also provide comprehensive information management and consulting services that combine data review and engineering services.

IRM operations
We have extensive experience in subsea operations, project engineering and management. We offer full management of IRM operations, including the coordination and planning of vessel operations, inspections and repair/maintenance programs. We will manage Global Information Systems (GIS) to maintain a continuous update of the condition and status of the subsea production infrastructure.
Our products and technologies

Our monitoring and inspection techniques rely on a range of innovative products described below:

Floaters, buoys & moorings
- Mooring Line Load Monitoring System (MLLMS)
- Anchor Leg Load Monitoring System (ALLMS)
- Navaid & telemetry system
- Magnetic hull inspection
- Acoustic emission cracks detection systems
- Subsea data logging systems

Risers, pipelines & umbilical
- Rigid Riser Integrity Monitoring System (RIMS)
- Rigid Riser Tension Monitoring System (RTMS)
- Flexible pipe annulus monitoring
- Flexible "In bore" inspection tools
- Flexible pipe armour wire monitoring
- Acoustic emission cracks detection systems
- Subsea data logging systems

Subsea flow assurance
- Pressure & Temp Monitoring System (P&TMS)
- Slug Detection System (SDS)
- Wax Detection System (WDS)
- Subsea data logging systems
Some exemples of our products:

1. Mooring system to evaluate tension from inclination measurement

2. Flexible “in bore” inspection for visual inspection and internal pipe geometry

3. Flow assurance slug detection system (a) and wax detection system (b)
Our service strategy

Production Integrity offers monitoring, inspection and survey services for key production assets and recommends realistic solutions designed to provide the most efficient and cost effective actions.

Our strategy is to:
- Improve asset performance by reducing risk of failure and accidents, therefore optimizing maintenance schedules and increasing asset availability
- Differentiate ourselves with proprietary technologies for measurement, data management, risk analysis and interpretation
- Cultivate a service culture with a dedicated and independant team
- Offer a global project management approach for operations (monitoring, inspections) and maintenance of asset throughout field lifecycle

International network
With a hub of worldwide technology centers our international framework is growing to support all the key energy regions
Our central business model is also executed regionally across the world to give you local support
Technology is an integral part of our offering. We are dedicated to:

- Innovative measurement and monitoring techniques,
- Developing ROV and AUV capabilities for inspection and survey applications and new generation data harvesting and streaming processes,
- Integrated data processing and management.

We differentiate ourselves by offering Production Integrity services across the full range of the value chain. Our dedicated technology centers have the capability to develop proprietary software systems and integrate them into added value solutions. This allows us to design bespoke systems, customized to specific needs to compliment our range of standard products and solutions.
Production Integrity goes beyond monitoring equipment condition and inspection. We enhance flow, keep people safe, protect the environment and extend the lifespan and viability of projects.

We set ourselves apart with an in-house capability to create proprietary software, enhancing every link in the Production Integrity value chain.

We offer services that add unrivalled value by maximizing production, minimizing downtime and streamlining maintenance operations throughout project lifecycles.