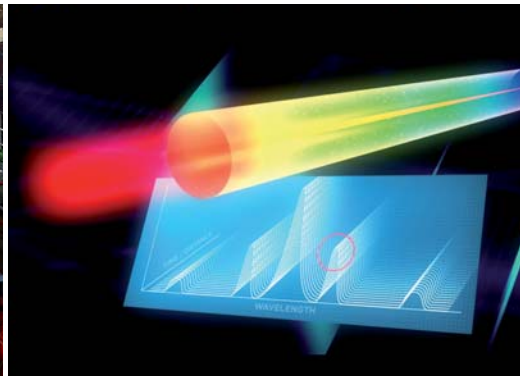
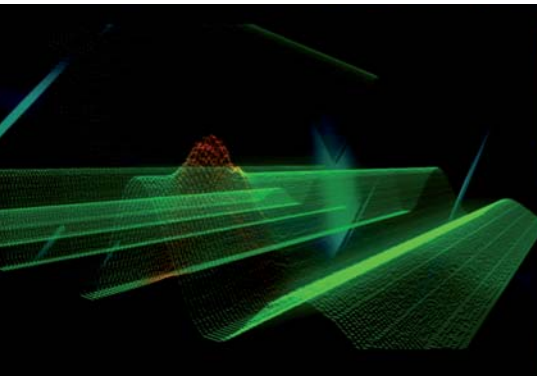
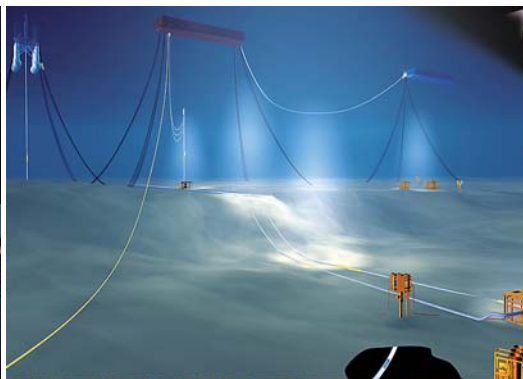


Riser Integrity Management

Products and Services



RISER INTEGRITY MANAGEMENT: AN ANSWER TO NEW INDUSTRY CHALLENGES

New field discoveries located in challenging environments have pushed the boundaries of oil and gas production experience. Operators must increase focus on their assets throughout the field life. Within an industry going towards greater challenges and increased water depths, the monitoring of riser operational data has become a key parameter to ensure optimal production in addition to safety of personnel, equipment and environment.

As a result, Technip and Schlumberger have signed a global cooperation agreement to jointly develop subsea integrity and surveillance solutions for flexible pipes. The two companies bring advanced flexible pipe integrity management solutions and services to the market.

Clients & operators benefits:

- Ensure and enhance safety of personnel, work environment and assets
- Forecast, predict and detect potential product failures; ensure long term reliability
- Propose durable and efficient risk management to accelerate the decision process related to HSE issues
- Reduce risk and probability of unplanned production shutdowns
- Optimise Inspection, Maintenance and Repair plans

Our strengths:

- R&D driven companies committed to delivering innovative, qualified and reliable technologies
- Wide area of intervention, from pipe manufacture to offshore support
- Dedicated personnel, services and assets ensuring client support throughout entire project life
- Flexible pipe expertise: from raw data to pipe integrity assessment

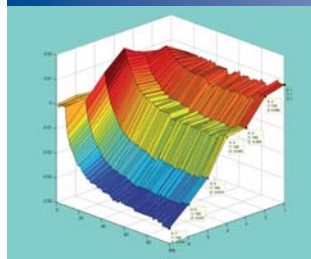
R I S E R I N T E G R I T Y M A N A G E M E N T

Products & Technologies



- Qualified and innovative solutions
- Integrated or retrofitted products
- Best-in-class technologies

Data management & Interpretation



- Surveillance data system
- Hardware and software
- Data interpretation and reporting based on riser expertise / knowledge

Offshore Services



- Inspection /Maintenance/ Repair (IMR)
- Onsite support and expertise
- Qualified personnel, tools and procedures

Project Management



- Risk Analysis
- Integrity Management Plan
- Interface Management

Annulus Condition Surveillance

APPLICATIONS:

One of the main concerns regarding flexible pipe integrity is its annulus condition, as a flooded annulus can in some cases lead to corrosion and impact service life of the pipe.

subC-dts

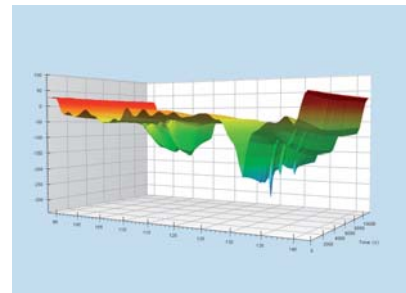
The subC-dts provides continuous monitoring of local temperature distribution along the length of the riser to detect:

- Abnormal temperature drops due to ingress of seawater through the external sheath
- An accumulation of condensed water vapour that has not flowed to the annulus vent ports
- Data to support flow assurance, for preventing hydrates and major wax deposition

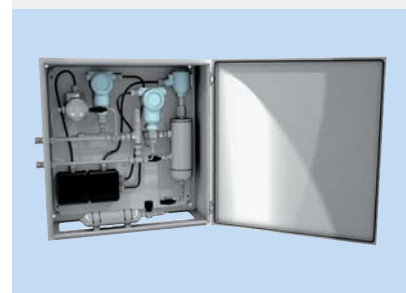
subC-racs

The subC-racs is an automated surveillance system for integrity assessment of flexible risers and provides:

- Continuous monitoring of gas volume and liquid level in the annulus
- Continuous monitoring of gas diffusion rate
- Real-time detection of damage to the riser outer sheath
- Detection of restriction to gas flow in the annulus or vent port
- Sampling and analysis of vent gas



Typical subC-dts data output



subC-racs system



subC-dvs



subC-tes

Armour wire integrity monitoring

subC-dvs

The subC-dvs, distributed vibration sensing system, measures vibrations along the length of the flexible riser in order to monitor armour wire integrity. It can:

- identify the signature released from breaking wire events
- alert the operator during the early stages of wire damage
- provide data to allow for remedial action to be planned well in advance of potential failure

subC-tes

The subC-tes, torsion and elongation monitoring system, detects permanent structural changes to the flexible riser at a number of discrete locations to characterise wire integrity events:

- non-intrusive sensing system
- ROV retrofittable

In addition to the presented solutions, Schlumberger and Technip can also propose additional or existing integrity management services and technologies.

Technip is a world leader in the fields of project management, engineering and construction for the oil & gas industry, offering a comprehensive portfolio of innovative solutions and technologies.

With 23,000 employees around the world, integrated capabilities and proven expertise in underwater infrastructures (Subsea), offshore facilities (Offshore) and large processing units and plants on land (Onshore), Technip is a key contributor to the development of sustainable solutions for the energy challenges of the 21st century.

Present in 48 countries, Technip has operating centers and industrial assets (manufacturing plants, spoolbases, construction yard) on five continents, and operates its own fleet of specialized vessels for pipeline installation and subsea construction.

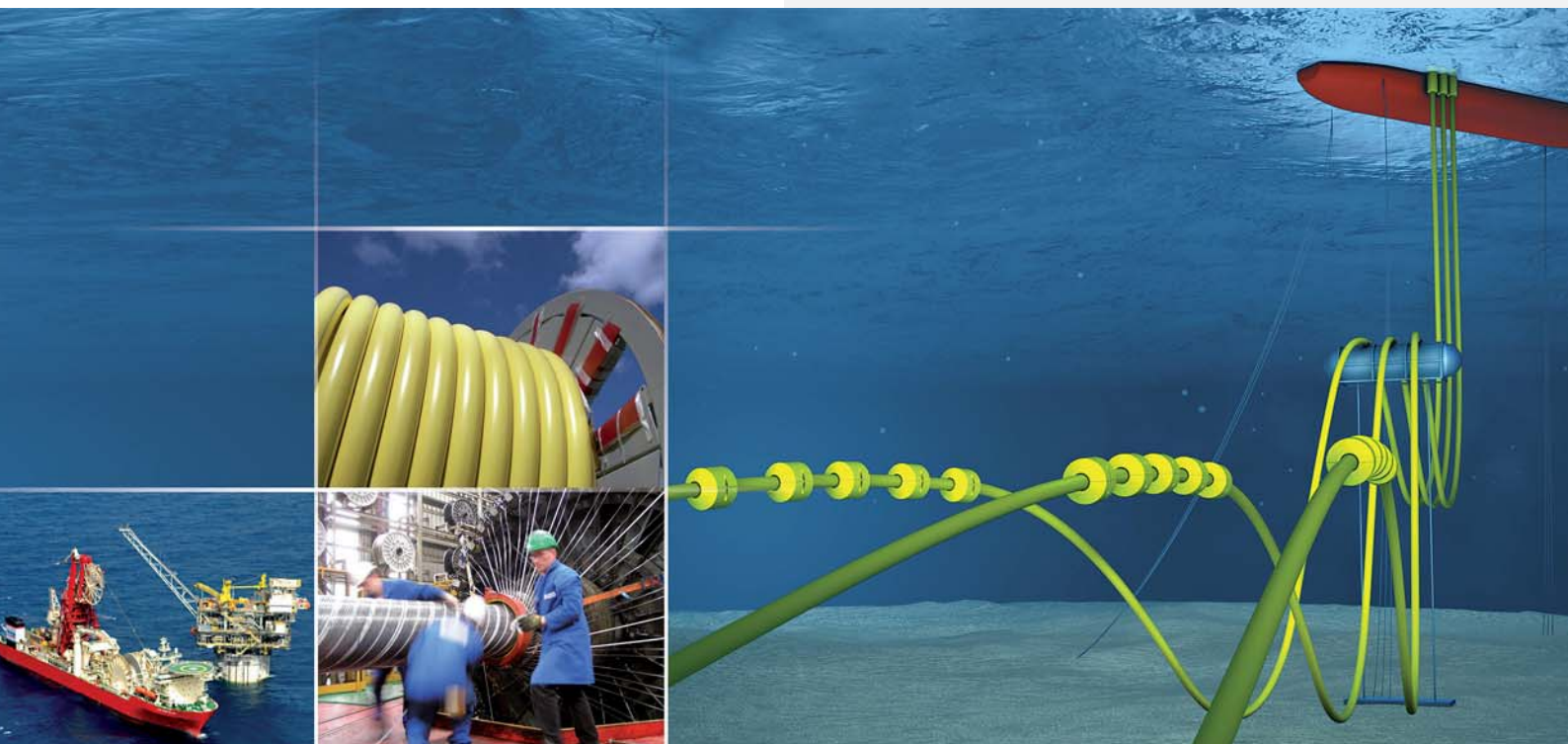
The Technip share is listed on Euronext Paris exchange and over the counter (OTC) in the USA.

www.technip.com

Schlumberger the world's leading oilfield services company supplying technology, information solutions and integrated project management that optimize reservoir performance for customers working in the oil and gas industry. Through our well site operations and in our research and engineering facilities, we are working to develop products, services and solutions that optimize customer performance in a safe and environmentally sound manner.

Schlumberger Subsea provide instrumentation and measurement for structural integrity, flow assurance and process optimisation of subsea assets, including risers, flowlines and other critical elements of the subsea infrastructure.

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