Process & Pipeline Serv

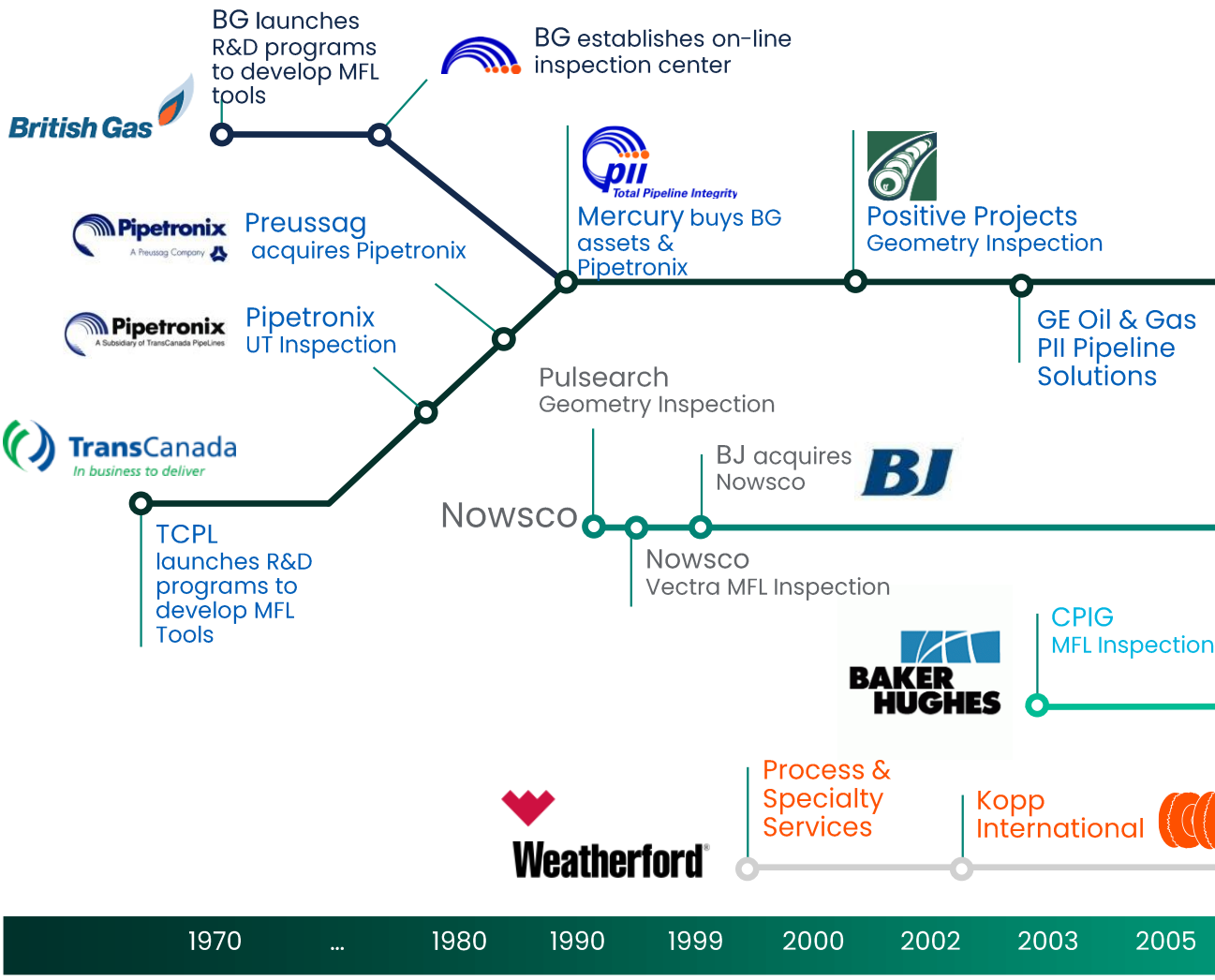
Helping you confidently manage the lifec of your asset



October 17, 2022

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Process & Pipeline Services He

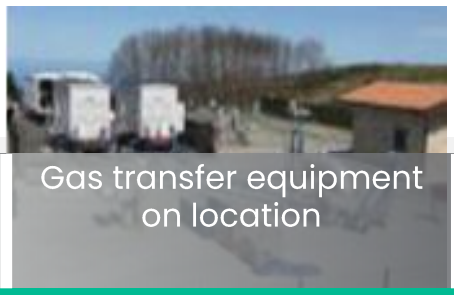


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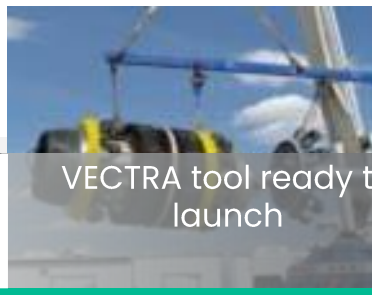
Process & Pipeline Services



Subsea pumping module connected to customer ROV



Gas transfer equipment on location



VECTRA tool ready t launch

Pipeline services

Key services

Pre-commissioning

- Engineering
- Flooding, Cleaning and Gauging
- Testing
- Conditioning
- Subsea Services
- Umbilical Services
- Commissioning – Product First Fill
- Site Preparations

Maintenance

- Mechanical Cleaning
- Gel Cleaning
- Chemical Cleaning
- Testing and Revalidation
- Nitrogen Services
- Gas Transfer/Recompression
- Temporary Flaring
- Temporary Isolations
- Temporary Pumping
- Pig Manufacture

Pipeline inspection (IL

- Internal geometry inspec
- Mapping
- Corrosion and crack detection
- Ultrasonic pipeline inspe

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Pre-commissioning of the wor gas pipeline



The ground breaking Nord Stream pipeline project, comprised of two 1,224km long, 48-in. diameter twin gas transmission pipelines running from Russia to Germany– a delicate marine environment that needs to be protected and preserved.

The world's longest-ever single-section dewatering operation, including the longest travel distance for tie-in sealing tools. Establishing a concept, engineering and planning, selecting a main water source and water treatment regime, and identifying risks were among the tasks project managers undertook.

The entire process was helped by a specifically designed equipment spread

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Pipeline maintenance

Mechanical cleaning, gel cleaning, chemical cleaning, testing c transfer/recompression, temporary flaring, temporary isolation







Cleaning

- Tailored cleaning solutions to keep pipelines at optimum operating conditions
- Mechanical and chemical cleaning
- GelPig™ cleaning offers significant debris recovery including 'black powder' recovery, wax and other deposits.
- General maintenance /routine cleaning
- Cleaning in readiness for 'ILI' campaign as 'turnkey' offering.

Isolations

- Localized repairs within pipelines enabled
- Isogel valve sealant
- High differential pressure pig trains. Pipe freezing is a method of temporarily isolating a pipe by applying a freeze jacket and circulating a cooling agent (liquid nitrogen). The contents within the pipe are chilled to create a solid, frozen plug with pressure holding capabilities.
- Used in valve change outs and pipeline revalidation.

Enviro

- Safe that lose
- Temp mou
- Gas
- 2 or
- High moni

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Inline inspection and integrity s

Delivering actionable insights to enable decisions that p





Inspect and **analyze** pipelines

Reliable + **accurate da** to assess + **pr** potential issu

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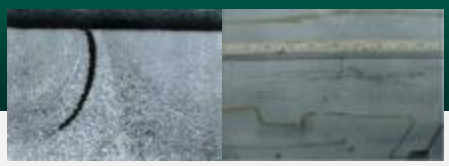
Inline inspection and integrity s

The right technology for every technology challenge



Corrosion and metal loss

- General, complex corrosion
- Pitting, pinholes or laminations
- Dents with metal loss
- Clean baselines, few defects
- Lost integrity
- Direct comparisons of corrosion growth between inspections



Crack detection

- Pipeline with propensity for seam and girth weld cracks
- SCC cracks of unknown gestation and failure state
- Extensive SCC crack fields populated with both critical and subcritical cracks



Geohazard & third

- Internal diam. (ID), r expansions
- Bends, ovalities buc
- Construction, third- product theft
- Dents with cracks, g
- Inaccurate location fractures
- Missing records
- Excessive tensile str to line rupture
- Large compressive cause buckling or w

Enabling products

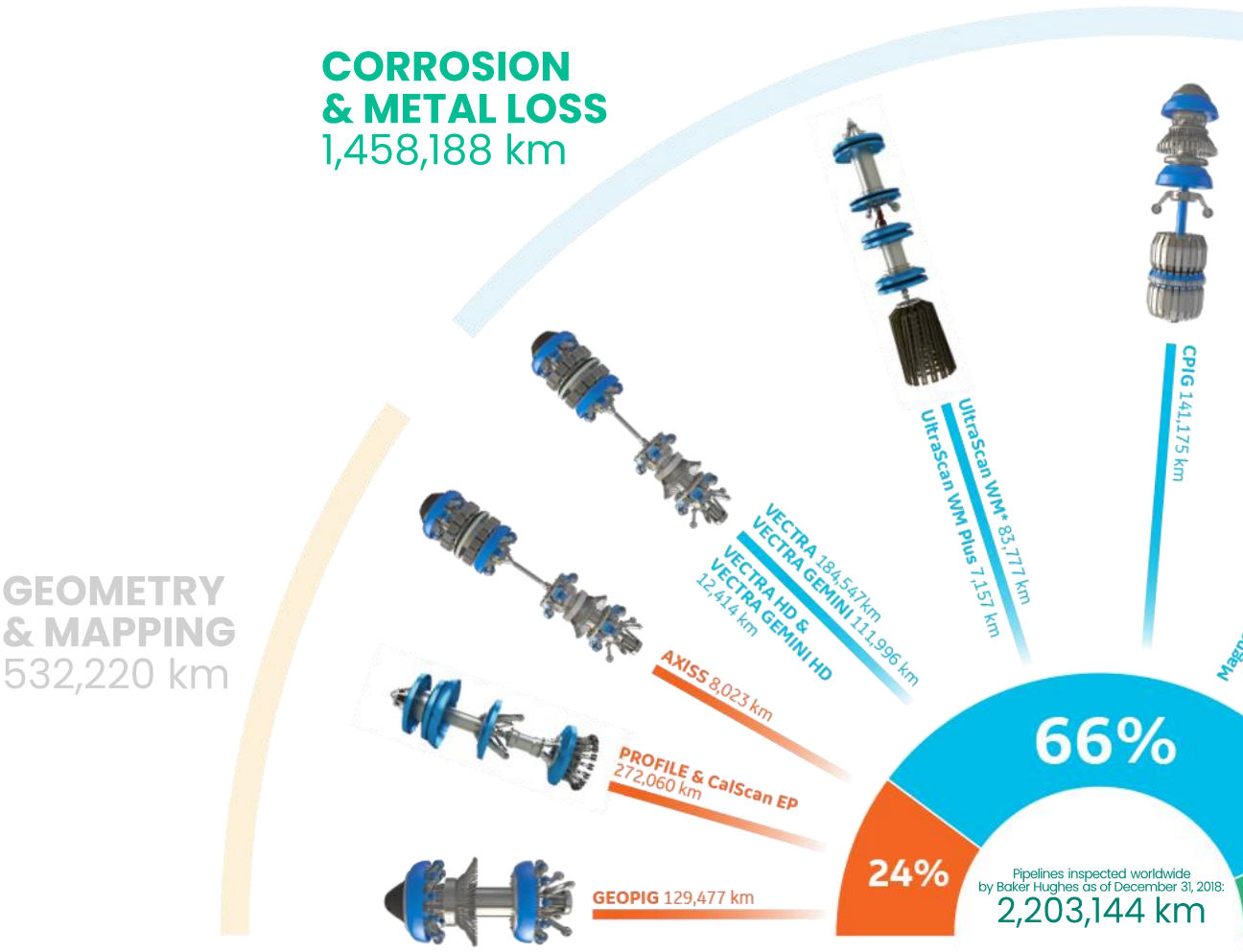
- MagneScan, VECTRA, VECTRA GEMINI
- UltraScan WM/WMP
- UltraScan DUO
- TranScan TFI
- CPIG
- Runcom, Fitness for service, Pipeline risk assessment

- EmatScan
- UltraScan CD, CDP
- UltraScan CD EDGE
- UltraScan Duo
- TranScan TFI
- Pipeline risk assessment, IMU strain, PICA

- PROFILE, CalScan EP
- GEOPIG
- MagneScan, VECTRA
- ThreatScan
- Pipeline risk assessr PICA, Fitness for serv

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PIPELINE INSPECTION TRACK RE



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Corrosion & metal loss

VECTRA™ GEMINI HD



- 20″ to 48″. MFL, Caliper & IMU technology
- Tri-axial sensors, 1.5D, speed control NPS24+

MagneScan™ SHRP



- 6″ to 52″. MFL, Caliper & IMU technology
- Tri-axial sensors, 1.5D, heavy wall
- SHR & HR resolution configurable

UltraScan™ WM



- 6″ to 42″. Ultrasonic wall measurement technology
- Pinhole specification with WMP

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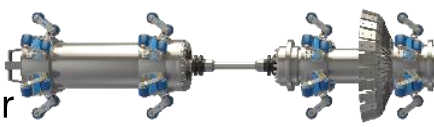
Corrosion & metal loss

TranScan™ TFI



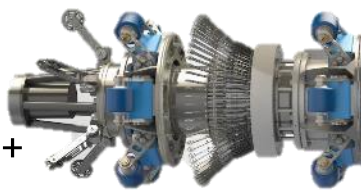
- 8 to 30”. High resolution axial MFL and Caliper
- Detect axial flaws with confidence

MagneScan™ HR



- 6 to 56” High resolution axial MFL, Inertial, Caliper
- Dual diameter and heavy wall options

VECTRA™



- 12” to 48”. MFL & IMU Technology
- Tri-axial sensors, 1.5D, heavy wall, speed control 24” +

CPIG™



- 4” to 48”. High resolution axial MFL, Caliper, IMU Technology
- Dual diameter and difficult to pig pipe pipelines

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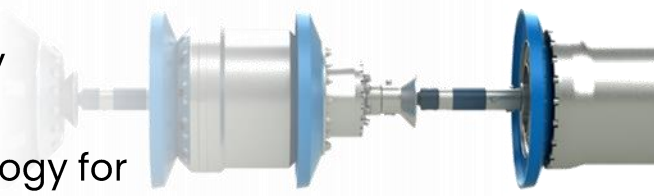
Crack detection

UltraScan™ CD/ CDP/ CD Edge



- 10” – 34”. Ultrasonic technology
- High speed capabilities, industry leading accuracy
- EDGE gives superior small crack detection (15mm)

UltraScan™ DUO



- 24” to 36”. Phased array technology
- CD and WM capabilities.
- The highest performance ILI technology for advanced crack defect morphologies - replaces

EmatScan™



- 24”, 26”, 30”, 34”, 36”. EMAT technology
- Unrivalled POD of critical crack features
- Unrivalled POI performance means less digs
- Deployment in gas lines & liquid lines.
- Cracks in dents

Geohazard & third party damag

GEOPIG™

- 8” to 48”. Caliper & IMU technology
- High resolution caliper, 1.5 D
- Dent Strain

CalScan EP™



- 10” to 48”. Caliper & IMU Technology
- Line proving
- Dent strain

PROFILE™

- 12” to 48”. Caliper technology
- Line proving for MFL/UT, robust, 1.5 D – 3 D, construction surveys

AXISS™



- 12” to 42”. At the back of VECTRA/GEMINI
- ILI absolute Axial Strain measurements, 1.5 D
- 1 data point per 1m

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Going to great lengths for the

An industry first: The longest ever gas pi

Diverting the contents of a 941-km line to fit additional launchers was a complication TransCanada would rather avoid.

We engineered multiple scenarios which included assessing pipeline cleanliness to provide confidence in our ability to safely navigate the line.

Opting for the “one pass”, we utilized our VECTRA™ HD GEMINI with a specially designed gauge tool.

“This monumental project was an industry first and will substantially advance our ability to keep communities safe and reduce costs and service disruptions for TransCanada and our customers”, Bryce Lord **– Vice President of Canadian Gas Operations, TransCanada.**

"We are grateful to be able to leverage PPS’ technica relationship to advance our capabilities to ins

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Process pre-commissioning

Mechanical and chemical cleaning, pressure testing, leak testi flaring









Nitrogen services

- Identifies leaks in excess of predetermined spec
- Industry's preferred method of checking joint integrity and preparing hydrocarbon process facilities for leak-free start up
- Frees the system of oxygen prior to start up

Hydrotesting

A strength test is always required for new piping and associated vessels to ensure the following

- Safety
- Reliability of operation
- Leak tightness of pressure systems

All work is conducted under rigid procedures and according to code, ensuring total control at all times.

Air services

- Variety of effective drying techniques for process systems that are sensitive to moisture
- Suitable for complex plant configurations with multiple vent points
- Equipment can be cross-utilized for air blowing, pneumatic strength testing and purging (w. membrane nitrogen)

Chemi

- Enviro friendl non ha cleans
- Non cl carrie (Gold
- Degre passiv
- Clean comp assoc post a

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Process maintenance

Mechanical and chemical cleaning, pressure testing, leak testing, drying, bolting, on-site machining, camera inspection, gas recompression, foam decontamination







Nitrogen services

- Prevent loss of production due to unplanned shutdowns
- Industry's preferred method of checking joint integrity & preparing hydrocarbon process facilities
- Can be engineered, planned and scheduled in advance to minimize impact on concurrent work

Drying services

- Variety of effective drying techniques for process systems that are sensitive to moisture
- Suitable for complex plant configurations; multiple vent points
- Equipment can be cross-utilized for air blowing, pneumatic strength testing and purging (w. membrane nitrogen)

Reactive chemical cleaning & decontamination

- Environmentally friendly non toxic and non hazardous cleansing flu
- Non classified and carrie CEFAS approval (Gold Band).
- Degreasing, descaling, passivation
- Cleaning of critical compressor/turbine associated pipework po assembly
- Decontamination and to cleaning

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Baker Hughes

Overall Presentation

Cesar Pulido

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HSE moment—5 fundamentals

For any journey we must always determine if it is necessary or if there is another way. Use Road Journey Management Planning Risk Assessment to identify the risks and score the risk ranking.

If the Risk Assessment determines that a JMP is required, identify the controls that will mitigate the risks. Such as, if trip will require several hours driving time, scheduled breaks must be planned.

If things change during the journey, i.e. planned route is expectantly closed causing a detour, or the weather unexpectedly changed to heavy rain, the journey should be suspended and risks re-evaluated to identify new mitigation controls.

Any lessons learned, things that went well or not so well, should be captured and used to improve the process.



Ident

Is the tr



Contr

Develop



Follow

Follow F



Mana

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Learn

Docum

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Digital pilots—current testing a Baker Hughes

Electrical safety



High-voltage voltage sensing wearable



High/medium voltage sensing band



Low/med voltage sensing band

Lone worker



Biometric sensors



Location monitoring wearables



Workforce management

Materia







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Digital tools—increasing safety

Telepresence



Ergonomic sensors and exoskeletons



Electric current sensing



Heat sensing



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Smart helmet

Smart Helmets are safety hardhats that virtually connect engineers in the field directly to headquarters support staff, who can provide immediate troubleshooting and guidance through complex tasks via audio and video.

Smart Helmets have the ability to relay real-time data, technical drawings and procedures into the helmet's visor and receive expert feedback—meaning missions that required several trips can be completed in just one outing. If widely adopted, this technological advancement has the potential to save oil and gas operators millions of dollars.

Click here to see how Baker Hughes' smart helmets point to the future in oil and gas.



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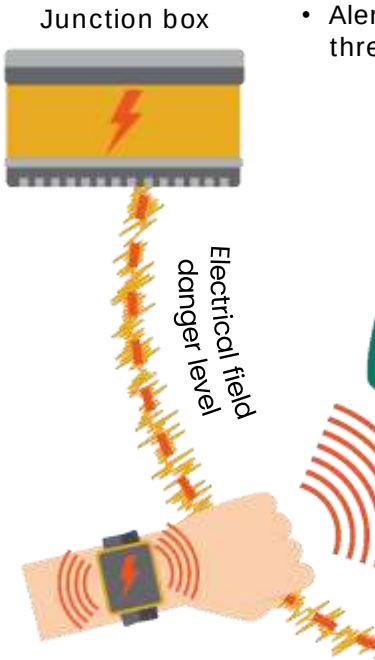
Wearable voltage sensing dev

Voltage sensing devices are wearable devices that detect energized assets and alert the wearer when in close proximity, preventing contact with known and unknown energized assets.

The devices are engineered for the field technician who is not focused on a specific trade, but during normal day-to-day operations, interact with electrical and maintenance procedures across various assets and equipment.

GE businesses have been piloting a variety of commercially available devices as no one device covers both AC and DC energy and the wide range of voltages present in many work locations.

These devices do not replace direct measurement tools, but they do provide an additional/secondary layer of protection for the field technician in avoiding electrical shock.



Wearable voltage device

- Detects electric fields
- Alerts user of danger
- Gives vibration feedback
- Interacts with app

User

- Aler
thre

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Predictive analytics

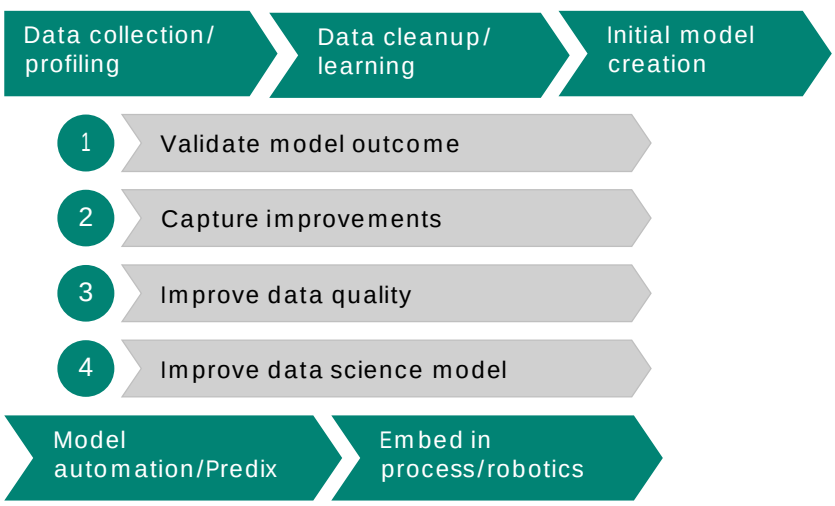
What are predictive analytics?

… use of injury/incident data to develop predictive models for identifying priority risk areas

How are the results used?

… to optimize resources and support to eliminate or mitigate risk in those focus areas

What is the process?



HiPo pilot

What is HiPo?

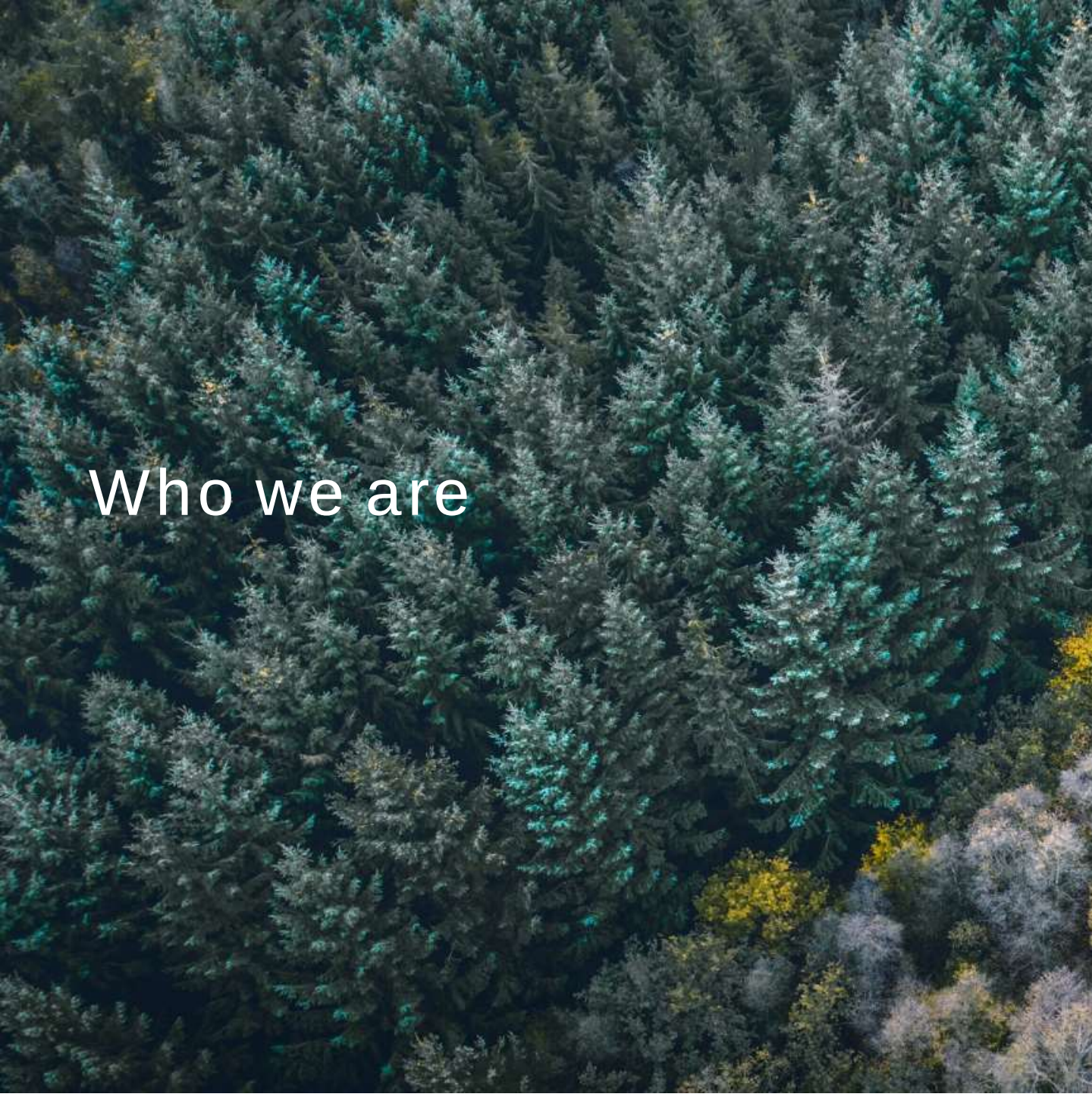
… an HSE incident or nea
the most probable outc
a high potential [HiPo] f
adverse effect - catastr
significant property or e
damage, or fatality. Also
Potentially Severe Event

Why focus on HiPo?

Injury/illness reduction
… exponential reduction
enough

Customer expectations
process to identify pote
hazards, assess and ma

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Who we are

Leading the energy transition

We have committed to achieve net-zero carbon eq. emissions by 2050, and invest in new technologies to help customers reduce their emissions.

Low carbon ene

Reduce flaring, venting, and fugitive emissions



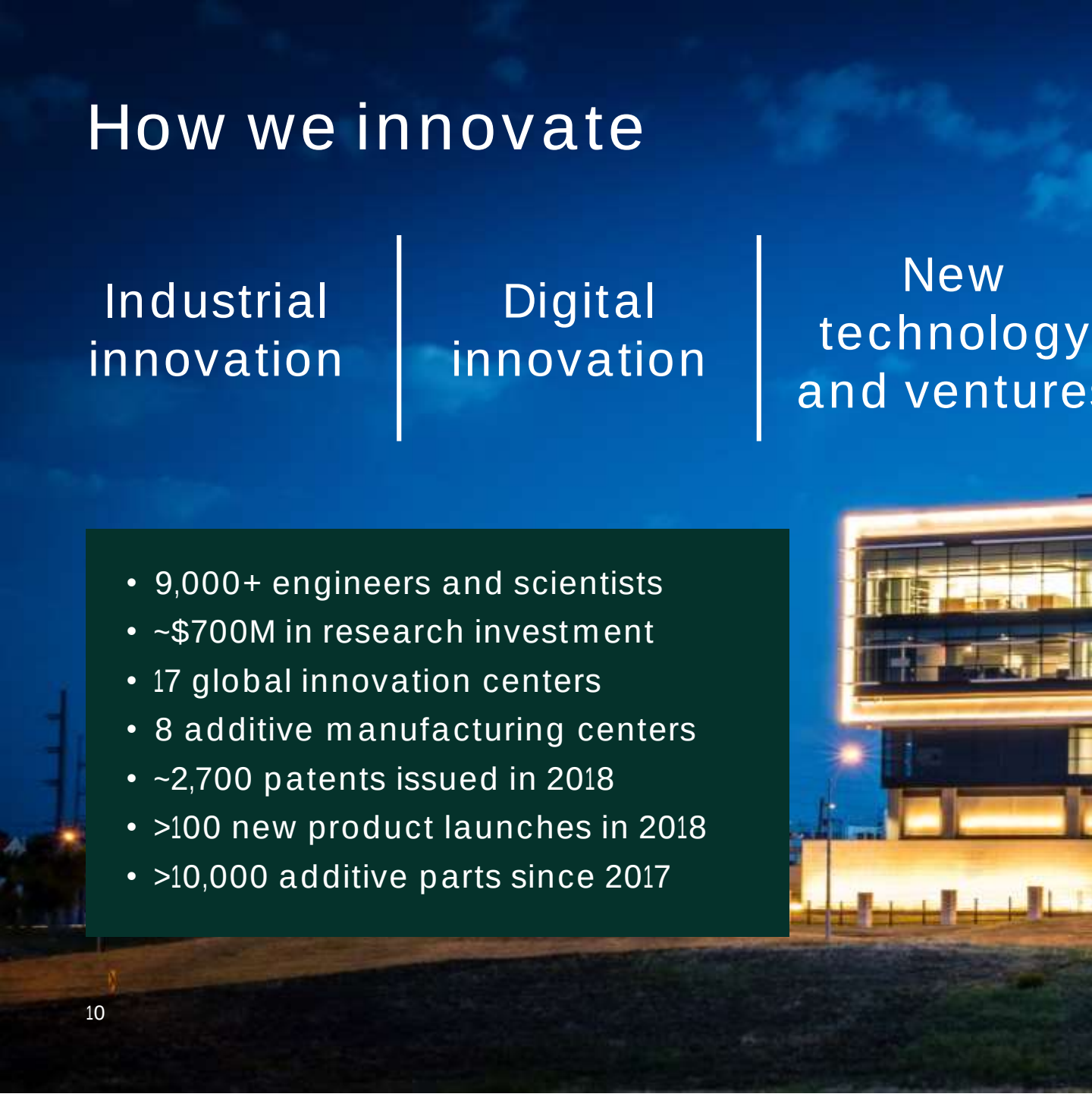
Effic pow gen



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How we innovate

Industrial innovation	Digital innovation	New technology and ventures



- 9,000+ engineers and scientists
- ~$700M in research investment
- 17 global innovation centers
- 8 additive manufacturing centers
- ~2,700 patents issued in 2018
- >100 new product launches in 2018
- >10,000 additive parts since 2017

Our values



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Our strategy

Leading product companies

- Innovative products & services
- Integrated solutions



Lead with technology

- Advanced manufacturing
- Digital transformation



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Executive leadership team



Lorenzo Simonelli

Chairman & Chief Executive O



Uwem Ukpong

Chief Global Operations Officer



Maria Claudia Borras

President & CEO, Oilfield Services



Neil Saunders

President & CEO, Oilfield Equipment



Rod Christie

President & CEO, Turbomachinery & Process Solutions



Jody Markopoulos

Chief Transition Officer



Jennifer Hartsock

Chief Information Officer



Will Marsh

Chief Legal Officer



Our Product Companies

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Our product companies



Oilfield Services

Lower cost per barrel over the life of field





Oilfield Equipment

Ultra-reliable technologies for the harshest environments



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Baker Hughes portfolio

Oilfield Services

• Coring Services • Logging-while-drilling Services • Surface Logging Services • Wireline Cased-hole
• Wireline Well Integrity Evaluation • Geoscience & Petroleum Engineering • Gaffney, Cline & Associat
• Drilling Fluids & Cementing • Drilling Optimization Services • Coiled Tubing Drilling Services • Integr
• Integrated Well Construction • Liner Hanger Systems • Multilateral Systems • Packers • Gas Lift Sy
• Stimulation and Fracturing • Sand Control • Isolation Valves • Completion Fluids • Perforating • I
• Production Optimization • Asset Integrity • Fishing Services • Workover Systems • Smart Services

Oilfield Equipment

Subsea • Subsea Connect / quickConnect Subsea Tieback Solution / Integrated Production Enhance
Planning Integrated SPS+SURF projects / engageSubsea • Subsea Production Systems (trees, control
• Subsea Wellheads (MS-700, MS-800, SFX) • Flexible Pipe Systems (conventional & composite flexible
• Subsea Asset Integrity Management Solutions • Subsea Well Intervention Services (LWI, RLWI), Fluid s
• Floating Production Systems (Risers & tensioner systems, tieback connectors, tendon connectors)
Surface • Surface Wellheads (Conventional, Multi-bowl, RSH – Riser Speedhead) & Aftermarket Servic
• Reinforced Thermoplastic Pipes (RTP)
Drilling Rig Equipment & Services • BOP systems, ram & annular BOPs, BOP control systems, monitorin
chokes & valves / Offshore Drilling Systems –Subsea (Drill ships & Semi-subs) / Offshore Drilling Syst
(After market services incl. recertifications, inspections, CSAs, engageDrilling)
Drilling tubulars • Speciality Connectors & Pipes

Turbomachinery & Processing

• Aeroderivative Technology • Heavy Duty Technology • NovaLT Technology • Impulse Technology
• Electrification • Advanced technologies • API 618 process compressor • PK – LDPE compressor • T
• Repairs • Field activities • Conversions, modifications and upgrades • Used serviceable materials
• LNG main refrigerant compression • LNG power generation • Onshore compression • Onshore pow
• Pre-assembled units • ORegen – Waste Heat Recovery ORC system for Power Gen • Waste Heat Re
Cold Duty Generation • HIPER - Waste Pressure Recovery & CO2 abatement • Liquid Air Energy Storag
• BB2 DVSHF/THF pump • BB3 MSN centrifugal pump • BB4 DDHFR ring section diffuser pump • BB5 D
• OH process pump • Vertical pumps • Pumps services • Fuel gas system • Hydraulic power recove

Digital Solutions

• Advanced inspection Services • Condition Monitoring • Control Systems and Migrations • Emission
• In-Line Inspections • Moisture Analysis • MWD and LWD Sensors • Non-destructive testing • Nucle
• Pressure Measurement • Process pre-commissioning and maintenance • Radiation Measurement

Software & Analytics

• BakerHughesC3.ai: Fullstream AI • Turbomachinery Digital Solutions • Valvelife Cycle • Sabio™ Log
• ARGOS™ 3D fracture prediction and stimulation modeling software • JewelSuite Subsurface Modelin
• Avitas Systems • I.Q.uity • Phantom View • VitalyX Lubricant Oil Monitoring • Druck's 4Sight2 Calibr
• Bit Vision • Perfect Well

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Oilfield Services (OFS)

Oilfield Services (OFS)

Delivering better efficiency, better production, and better ultimate recovery to drive customer success

- 30,000+ employees
- Operating in 120 countries
- 143 manufacturing facilities
- 734 local offices
- 1,500+ technology professionals

Enabling lower cost per barrel for the life of the well



Artificial lift systems



Oilfield & industria chemicals



Drilling services



Pressure pumping

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OFS product & service portfolio



Evaluation

- Logging & Coring
- Reservoir Software
- Geoscience & Petroleum Engineering
- Reservoir Consulting Services

Drilling

- Drill Bits
- Drilling Services
- Drilling & Completion Fluids
- Well Construction
- Well Intervention

Completions

- Well Construction
- Production Enablement
- Lower Completions
- Upper Completions
- Well Intervention

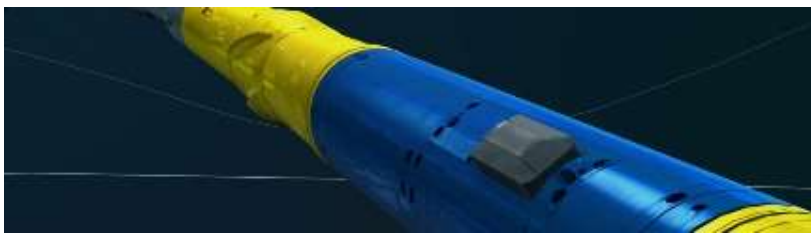
Production & optimization

- Artificial Lift
- Production Monitoring
- Production Chemicals
- Intelligent Production Systems
- Well Intervention
- Production Logging

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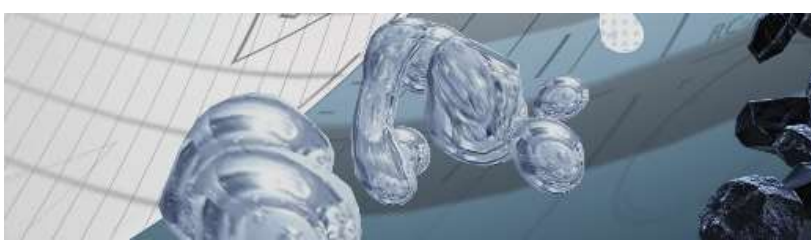
Drilling services

Baker Hughes comprehensive drilling solutions—from high-performance motors and rotary steerable systems to a comprehensive line of LWD and MWD offerings – and advanced application engineering services help operators hit the sweet spot precisely, efficiently and safely, regardless of the downhole environment. These offerings enable customized drilling campaigns that maximize the value of an operator's assets by increasing production and decreasing risk.



Directional drilling services

Superior directional drilling technology includes the industry's most advanced rotary steerable systems high-performance drilling motors, reliable hole-enlargement technology, and detailed measurement-while-drilling data.



Surface logging services

Surface logging services include geological service critical gas monitoring and analysis; real-time flui monitoring to minimize HSE risks; highly efficient co capture and retrieval; and 24/7 real-time operatio monitoring.

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Drill bits

The drill bits product line helps operators drill faster, farther, and more efficiently to reduce cost-per-foot in every drilling application. Technology innovations are based on extensive research, expert input from cross-functional teams, software modeling, and proprietary testing labs.

Product categories

- Polycrystalline diamond composite (PDC) drill bits
- Roller cone drill bits
- Hybrid drill bits



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Drill bits

Key technologies

- TerrAdapt™ **adaptive drill bit**
  Stop stick-slip and reduce drilling costs using the industry's only self-adjusting bit
- Kymera™ **Mach 4 hybrid drill bit**
  Get smooth, consistent drilling performance by combining the strengths of PDC and tricone bits
- Dynamus™ **extended life drill bit**
  Reduce lateral vibrations and trips in extreme drilling operations with a bit that's built to last

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Drilling and completion fluids

The drilling and completion fluids product line helps operators maintain wellbore stability and safety. Absolutely essential to production optimization, these fluids technologies are developed with a focus on downhole performance and operational efficiency.

Product categories

- Emulsion fluids
- Water-based fluids
- Specialty drilling fluids
- Drill-in fluids
- Waste management
- Completion fluids



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Drilling and completion fluids

Key technologies

- DELTA-**TEQ™ low**-pressure impact, high-performance drilling fluid system
  Drill with a thin fluid that won't sag, no matter the temperature
- EPI portfolio of high-performance, localized OBM components
  Get local, reliable, high-performance fluids, anywhere in the world
- MAX-**PRIME™ drilling fluid for** openhole completions and injectors
  Protect the reservoir in depleted zones and troublesome shales

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Drilling services

The drilling services product line offers high-performance motors and rotary steerable systems, as well as a comprehensive line of LWD and MWD offerings. Its advanced application engineering services help operators hit the sweet spot precisely, efficiently, and safely, regardless of the downhole environment. These offerings enable customized drilling campaigns that maximize the value of an operator's assets by increasing production and decreasing risk.



Product categories

- Directional drilling systems
- Logging-while-drilling systems
- Surface logging systems
- Geoscience services

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Drilling services

Key technologies

- AutoTrak™ **rotary steerable system**
  Maximize production and reduce economic risk with precise steering control
- GaugePro™ **Echo on**-command digital reamer
  Control and confirm reamer operations in real time, eliminate dedicated rathole trips, and improve operational efficiency
- VisiTrak™ **reservoir navigation and analysis service**
  See your reservoir up to 100 ft from the wellbore
- FASTrak™ **fluid analysis sampling and testing service**
  Get the volume and quantity of fluid samples you need—without compromise

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AutoTrak™ rotary steerable systems

Continuous proportional steering delivers a smooth, in-gauge hole.

How does it help?

Customized, customer-specific text to be inserted in this area.

Main product advantages

- Unsurpassed hole quality
- Exact well placement
- Enhanced drilling performance

Who is already using AutoTrak™?

Customized, customer-specific text to be inserted in this area.

What's the availability?

Customized, customer-specific text to be inserted in this area.

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AutoTrak™ rotary steerable sys

Maximize production and reduce economic risk with precise steering control

AutoTrak™ technology reduces the uncertainty of drilling away from the target, which minimizes economic risk, and ensures your well starts on-schedule and stays on-budget.

Unsurpassed hole quali

Using precision-controlled
maintain a continuous prop
steering vector, AutoTrak sy
drill a smooth, in-gauge ho

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AutoTrak™ rotary steerable sys

Get the superior performance you expect

- Use real-time logging to monitor geologic changes
- Monitor near-bit inclination every millisecond
- Make minute (± 0.1° inclination) course adjustments every second, when needed
- Use proportional steering to proactively adjust the well path

AutoTrak eXact Rotary Steerable drilling system	T h m
AutoTrak Curve Rotary Steerable system	T o u
AutoTrak G3 Rotary Steerable system	C in c
AutoTrak X-treme Rotary Steerable system	C p fo
AutoTrak eXpress Rotary Steerable system	R th s
AutoTrak V Rotary Steerable system	C e a

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VisiTrak™ reservoir navigation

The BHGE VisiTrak™ reservoir navigation and analysis service visualizes more of the reservoir, so operators know exactly where they are and where they need to go in order to build a better well.

How does it help?

Customized, customer-specific text to be inserted in this area.

Main product advantages

See 100 ft away from the well, to navigate precisely and efficiently.

Who is already using VisiTrak™?

Customized, customer-specific text to be inserted in this area.

What's the availability?

Customized, customer-specific text to be inserted in this area.

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VisiTrak™ reservoir navigation in depth

Build a better, long-term recovery plan, for higher overall profits

When you can see 100 feet into the reservoir, you can map approaching beds, boundaries, and pay zones—so you can design a completion and field management plan that maximizes long-term production potential.

Land your well more effi

With conventional logging w drilling (LWD) mapping and navigation technology, you only about 20 feet away fro wellbore. Because the VisiTr service can map the reserv five times that distance in r you don't need to drill costly holes to confirm the top an of the reservoir. Or worry ab coming in too low or too hig having to spend unnecessa steering back into the reser

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VisiTrak™ reservoir navigation specifications

Visitrack™ is based on more than an decade of reservoir navigation experience

- Incorporates unique LWD technology
- Gives you visibility up to 100 ft (30 m) from the wellbore into the formation—five times farther than conventional sensors
- Reduces well costs by eliminating pilot holes
- Lets you pinpoint the most productive pay and drill it to total depth (TD)

Mechanics of the service	•
	•
	•
	•
Well placement	•
	•
	•
Reservoir mapping	•
	•
	•

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Oilfield and industrial chemicals

The oilfield and industrial chemicals product line offers chemical services and technology solutions for the hydrocarbon production, transmission, and processing industries, as well as for other consumer-focused markets. Our relentless focus on innovation and superior service allows us to continuously deliver value-added solutions to our customers.

Product categories

- Upstream chemicals
- Downstream chemicals
- Well chemical services
- Aquaness wholesale chemicals
- Specialty polymers



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Oilfield and industrial chemica

Key technologies

- **TRETOLITE™ SNAP fluids separation** technologies
  Achieve superior oil and water separation while optimizing operations and lowering costs
- **FORSA™ flow assurance chemical solutions**
  Proactively manage risks to keep production flowing—safely and efficiently
- **TOPGUARD™ corrosion control solutions**
  Manage overhead corrosion to extend equipment run life and prevent unplanned shutdowns
- **SULFIX™ hydrogen sulfide (H_2S) scavengers**
  Mitigate H2S gas in crude oil, intermediates, and refined products to ensure safe operations







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Pressure pumping (outside U.S.)

The pressure pumping product line helps operators increase access to proven reserves while improving asset value and ROI.

Product categories

- Hydraulic fracturing services
- Offshore stimulation services
- Acidizing and acid fracturing services
- Cementing services
- Coiled tubing services
- Tubular services



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Pressure pumping (outside U.S

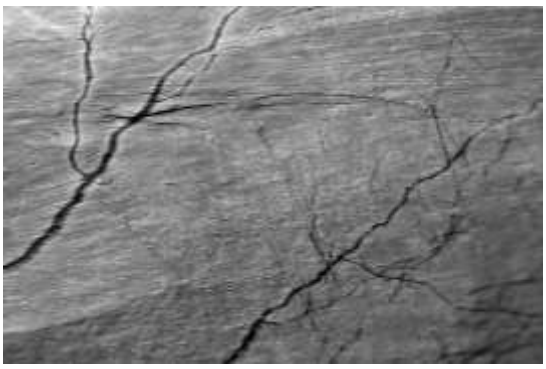
Key technologies

- TeleCoil™ **intelligent coiled tubing services**
  Eliminates uncertainties associated with traditional coiled tubing operations by providing operators with accurate downhole informatio in real time
- **Sorb™ solid inhibitors**
  Efficiently inhibit downhole deposition or tubular damage as the well produces with a family of slow-releasing and long-lasting solid speci chemicals
- Set-For-**Life™ cement systems**
  Ensure zonal isolation for the life of the well with cementing systems customized for specific wellbore conditions and environments

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Pressure pumping

Baker Hughes' pressure pumping services help operators increase access to proven reserves while improving asset value and ROI.



Production enhancement services

Production enhancement services maximize well productivity with effective, application-specific solutions. Services combine proppants, fluids, acids, diverters, and pumping technology—including advanced offshore stimulation vessels—with a formal workflow and better knowledge management systems.



Ceme

Cement optimize automa that ena deliver s isolation product convent and corr

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Wireline services

The wireline services product line offers a complete range of downhole well logging technology and services for every environment to help operators achieve a better understanding of their formations so they can find and extract hydrocarbons more efficiently and economically.

Product categories

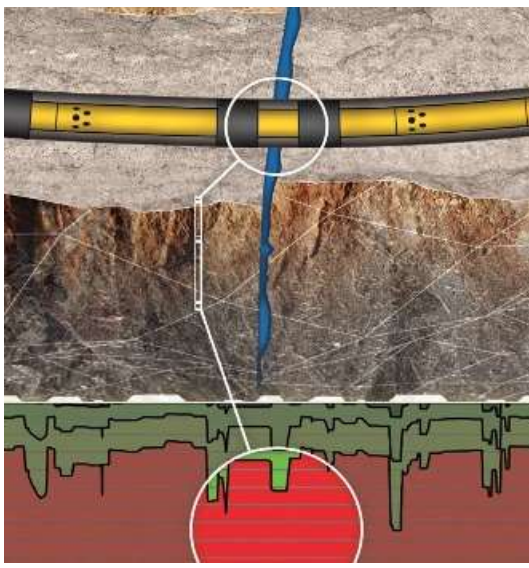
- Openhole logging services
- Cased-hole logging services
- Perforating services



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Wireline services

Baker Hughes' wireline services help operators achieve a better understanding of their formations in order to find and extract hydrocarbons more efficiently and economically. The product line offers a complete range of downhole well logging services for every environment.



Open-hole wireline se

Open-hole wireline services operators with advanced for evaluation and production a reservoir monitoring.

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Wireline services

Key technologies

- Array Dielectric eXplorer™ **formation evaluation service**
  Get key formation data to improve hydrocarbon reserve estimates
- Integrity eXplorer™ **cement evaluation service**
  Better understand cement bond to make critical downhole decisions – even in light-weight, contaminated cement
- FTeX™ **advanced wireline formation pressure testing service**
  Acquire real-time pressure data accurately, efficiently, and reliably

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Completions and well intervention

The completions and well intervention product line helps operators create and maintain a reliable production conduit and maximize hydrocarbon flow across the life of the well. The comprehensive portfolio improves recovery while minimizing intervention-related NPT—from first oil to final abandonment.



Product categories

- Wellbore construction
- Upper completions
- Lower completions
- Unconventional multistage completions
- Intelligent production systems
- Well intervention

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Completions and well interven

Key technologies

- FLEX-**LOCK™ V liner hanger system**
  Hang exceptionally heavy liners with minimal stress on the casing
- DeepShield™ deepwater subsurface safety valve
  Ensure fail-safe protection in critical offshore completions
- SureSENS™ **QPT ELITE permanent downhole gauge**
  Get reliable data in extreme downhole conditions
- SureVIEW™ **fiber**-optic well monitoring system
  Drive better production decisions and increase recovery with accurat
  downhole data
- **STONE WALL™ V0**-rated well barriers
  Achieve reliable, gas-tight isolation
- **DEEPFRAC™** deepwater multistage fracturing system
  Transform the efficiency—and the economics—of offshore completion

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Completions and well interven

Baker Hughes' completion solutions help operators create the ideal conduit from formation to surface to maximize production, reduce intervention cost, and extend the life of the well—regardless of the depth, reach, temperature, or pressure requirements.

Our well intervention services help operators clean and remove debris before completion; safely suspend production during storms or planned maintenance; conduct remediation and stimulation to rejuvenate production; sidetrack existing wells to reach new targets; and carry out safe and effective plug and abandonment at the end of the well's economic life.



Wellbore construction

Wellbore construction solutions help operators reduce capital expense and minimize risk.



Upper compl

Solutions for u
operators ma
and manage



Unconventional multistage completions

Solutions for multistage completions improve completion efficiency and maximize reservoir contact.



Intelligent pr

Intelligent pro
data, insight,
to make effec
The focus is o
production, in
and reduce t

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DENIZEN™ Coiled Tubing Syster

- Experience in all deep water arenas around the world
- Deployment skid and over boarding structure specifically designed for pipeline pre-commissioning applications
- Can be used to flood and hydrotest from the surface to the deep water pipeline, delivering the required fluids and compressed gases required during pre-commissioning.
- Reduce vessel time and cost by performing flooding and hydrotesting operations on the seabed.
- DNV certified lifting frames



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Artificial lift systems

The artificial lift product line offers the industry's most complete portfolio of artificial lift solutions, designed to maintain production and maximize reserve recovery for the life of a well. These flexible solutions allow operators to tailor production decisions to their specific technical challenges, business objectives, and reservoir requirements.

Product categories

- Electrical submersible pumping systems
- Rod lift systems
- Surface pumping systems
- Progressing cavity pumping systems
- Gas lift systems



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Artificial lift systems

Key technologies



- TransCoil™ rigless-deployed ESP system
  Eliminate the need for a rig to lower intervention costs and to minimize deferred production
- CENesis **PHASE™ multiphase encapsulated** production solution
  Separate gas slugs before they enter the ESP system to eliminate production interruptions
- CENtigrade™ **extreme**-temperature ESP system
  Improve production and up time in heavy oil thermal recovery projects



- FLEXPump™ **series pumps**
  Extend the operating range of ESP systems to reduce change outs as production rates decline

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Artificial lift systems

Baker Hughes offers a wide range of artificial lift solutions designed to maintain production and maximize reserve recovery over the life of a well. These solutions give operators the power to exploit the value of their assets through flexible production solutions that align with their specific business objectives and reservoir requirements.



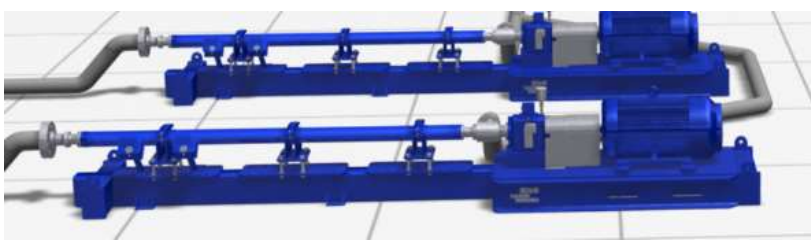
Electrical submersible pumping systems

Baker Hughes' technologically advanced and reliable electrical submersible pumping (ESP) systems provide effective, efficient pumping capabilities to maximize production and ultimate reserve recovery in wells with benign to harsh downhole environments.



Gas lift syste

Gas lift syster wells with hig injecting gas values locate mandrels or s



Surface pumping systems

Horizontal surface pumping systems combine proven, reliabl modular pumping technology with expert service and operational efficiency to reduce maintenance costs, minimiz down time, improve pumping performance, and mitigate environmental risks for a wide range of applications

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Integrated Well Services

The Integrated Well Services (IWS) business offers scalable turnkey solutions that maximize the value of an operator's assets through project management, well engineering, field supervision, risk management and contractor management. Focused on operational excellence with safe and cost-effective outcomes, IWS leverages technology solutions, digital platforms and Baker Hughes' global footprint.

Product categories

- Project management
- Well construction
- Well intervention
- Production services
- Plug and abandonment
- Coiled tubing drilling



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Oilfield Services ongoing resea



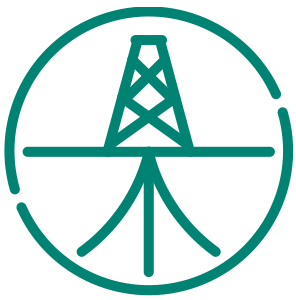
Molecular science

Model and design at micro level to create new chemicals and materials with revolutionary performance



Virtualization and automation

Network physical objects and perform data virtualization and analytics, including high-volume and high-rate data



Subsurface intelligence

Better understand the reservoir and forecast i production and reserve

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Oilfield Services global technol research centers



The Woodlands Technology Center

The Woodlands, Texas, USA



Celle Technology Center

Celle, Lower Saxony, Germany



Center f And Inno

Houston, T



Houston Technology Center

Houston, Texas, USA



Artificial Lift Research and Technology Center

Claremore, Oklahoma, USA



Dhahran

Dhahran, E

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Oilfield Equipment (OFE)

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Oilfield Equipment (OFE)

Next-generation technology, services and project management solutions designed to reduce the total cost of ownership for our customers. OFE draws from a portfolio of ultra-reliable technologies, including subsea trees, manifolds, blowout preventers (BOPs), flexible risers and advanced control systems.

- 8,000+ employees
- Global presence in all regions, including: Africa, Middle East, Asia Pacific, Europe, and the Americas
- 14 manufacturing facilities
- 16 service facilities



Subsea

- Subsea projects
- SPS installation
- Wellhead systems
- Trees
- Manifolds & connection systems
- Control systems
- Power & processing
- Specialty connectors & pi
- Flexible pipe systems
- Floating production syste
- Integrated services and solutions
- Decommissioning

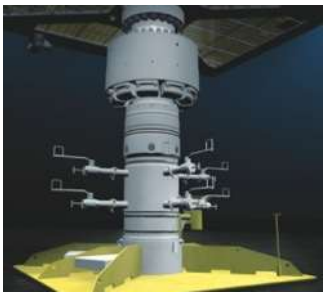
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OFE product & service portfolio



Subsea projects

- Engineering studies
- Field development planning



Subsea & surface drilling systems & services

- BOP systems
- BOP control systems
- Annular BOP systems
- RAM BOP systems
- Diverters
- Pulsation dampeners
- Choke and valves
- EngageDrilling services
- NDT BOP inspection technology



Surface pressure control

- Subsea wellheads and tubulars
- Specialty connectors and pipe
- Floating production systems
- Flow control valves and actuators
- Shale 360™ services



Subsea production systems

- Subsea trees
- Subsea production control system
- Subsea manifolds & pipeline products
- Subsea connection systems
- Subsea power & processing
- Installation and commissioning

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Oilfield Equipment markets served

Upstream



Subsea

- Subsea projects
- SPS installation
- Wellhead systems
- Trees
- Manifolds & connection systems
- Control systems
- Power & processing
- Specialty connectors & pipe
- Flexible pipe systems
- Floating production systems
- Integrated services and solutions
- Decommissioning



Drilling

- Offshore & onshore drilling sys
- Rig drilling services
- Blowout preventers
- Control systems
- Marine riser systems
- Elastomer products & spare p
- Aftermarket/field services

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DVXT Deepwater Vertical Tree S

The DVXTTM tree provides a structured, modular approach that shortens the delivery cycle, while increasing overall quality and engineering focus on the most important and unique project challenges.

How does it help?

- Enables BOP-on-tree opera in open water using OWRT
- Optional tree cap installatio through BOP
- Retrievable flow control mo

Main product advantages

Increases efficiency and quality at every stage, from shorter delivery cycles, to enhanced reliability

What's the availability

Adaptable modular system, i by simple support vessel, tree mandrel can accommodate BOP or completion riser.

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DVXT™ Deepwater Vertical Tre

Designed to take on the **world's most challenging** deepwater conditions

DVXT delivers, with an installation depth up to 3,000 m; operating pressures of 10,000 and 15,000 psi; and an operating temperature range of -18°C to +151°C.

Perform all work from your vessel

The DVXT is designed for qu more frequent well access, effective maintenance rega water depth. Deployed with SemStar5-R, the DVXT incor the latest in communicatio technology and is designed objectives of higher subsea reliability, extended service improved environmental m

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DVXT™ Deepwater Vertical Tre
Specifications

Flexible designs and modular components for improved performance

Master valve block configured for 13 downhole functions, including well safety valves and chemical injection.

Features	
Depth rating	
Design life	
Product structuring	
Subsea control module	

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Modular Compact Pump (MCP

Enabling subsea boosting through lower cost and space requirements

Broad adoption of subsea boosting has been hampered by high CAPEX of conventional systems, and topside space and weight constraints. BHGE's new Modular Compact Pump (MCP) significantly reduces topside space requirements (by up to 50%), and simplifies the umbilical to deliver a highly cost-efficient system.

MCP is a barrier-fluidless **pump that's up to 40% lighter, meaning** smaller vessels can be used for installation and intervention.

- Modular design has independently controllable stages, with integrated motor-impellers rotating around a static central shaft. This avoids the rotordynamic issues associated with conventional pumps, as well as the need for a mechanical seal, thereby compensating for stage loss and maintaining production.
- Modules can be stacked and built into larger systems depending on process needs, with a typical pump stacking between 4 and 24 stages, providing a pumping power range of 1–6 MW.
- Part of a suite of products aimed at lowering total expenditure across the life of field, MCP is being developed under a joint industry project (JIP) with several global operators and The Research Council of Norway, through its DEMO 2000 program.



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SemStar5™ subsea electronics

Ultra-reliability and flexibility for any communications requirements

Our fifth-generation design includes significant obsolescence management features, as well as ruggedization features extensively qualified beyond the requirements of ISO13628 Part 6.

Flexible communications options

- Fiber-optic modems (up to 1Gbit/s and up to 300 km)
- DSL modem (up to 5 Mbit/s and over 30 km)
- RS-422 (high-speed up to 800 m)
- Variable-speed multi-drop copper modems (9.6 to 115.2 Kbit/s)
- Low-speed copper modem (1.2 Kbit/s)
- Direct Ethernet (100 Mbit/s)

Enhanced reliability features

- Redundant DC power supply to i modules and Ethernet for backpl and inter-bay communications
- Single-board computer (SBC) ba on 32-bit microcontroller
- Robust internal electrical harnes design
- Fewer internal wiring interconnec
- Simplified motherboards
- Built-in circuit board diagnostics
- Fault-tolerant input/output (I/O) interfaces

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Speedhead™ wellhead system

Saving valuable rig time

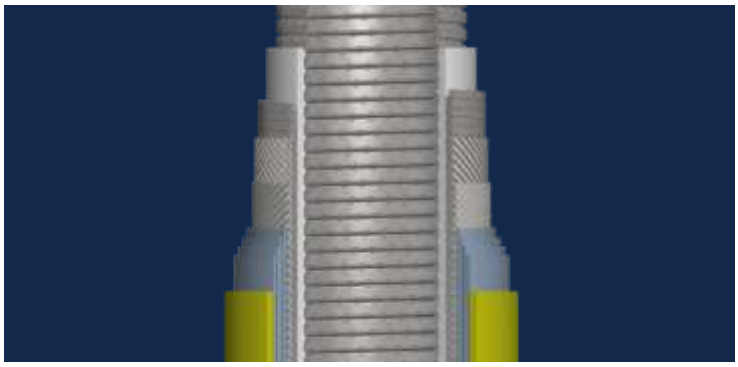
Our Speedhead™ wellhead systems are designed for safe and fast installation of casing and tubing. With optimal efficiency and flexibility across a wide range of operating conditions, they deliver considerable time and cost savings compared to conventional wellhead systems.

They can save anywhere from 17 to 40 hours of valuable rig time, depending on application—translating into incredible value given that US land-drilling rates range anywhere from $15,000 to $25,000 per day.

- Land Speedhead—for use as a two-stage starting head, combining the casing head and casing spool into a single housing
- Riser Speedhead—single-stage and multi-stage (multi-bowl) configurations
- SH2 Split Speedhead—multi-bowl system that supports and seals two strings of pipe in a single head
- SH3 Speedhead—lands two strings of pipe in one compact forged housing
- Offshore Speedhead—specifically designed for compatibility with drilling methods commonly used in the Gulf of Mexico.

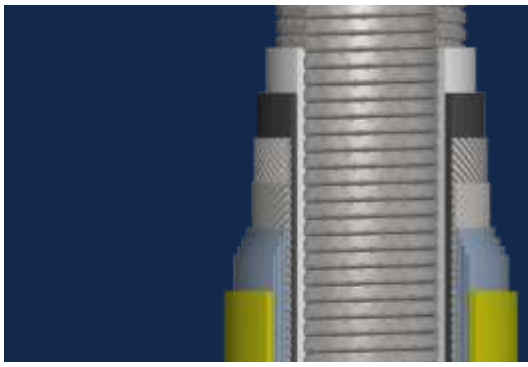
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Lower total pipeline system cos



Conventional flexible pipe

Flexible risers provide increased subsea-layout versatility, enabling the use of floating production units, and handling harsh dynamic environmental conditions. They are a particularly attractive solution for deepwater and ultra-deepwater environments.



Composite flexible pi

This game-changing design com recognized system benefits of a f solution with a lightweight structu deepwater and ultra-deepwater applications.

- 20% lower total installed cost v conventional flexibles
- 30% lighter weight vs. conventi
- Enables 15 Kpsi beyond 3,000 m
- 150˚C (300˚F) capability

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Turbo machinery & Process Solutions (TPS)

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Turbomachinery & Process Sol

Structured to serve our customers

- 10,000+ employees
- Operating across 120 countries in all Regions: Europe, Russia & CIS, Africa, Middle East & India, Asia Pacific & China, North America and Latin America
- Advanced manufacturing and services capabilities worldwide
- 15 innovation labs to enhance our additive, artificial intelligence, digital, service and materials capabilities
- A dedicated combustion lab to reduce gas turbine emissions with different fuels, including hydrogen
- 1,000 Field Service Engineers
- A Technical Training Academy & Leadership Learning Center

Portfolio

- Aeroderivative, heavy-duty a gas turbines
- Gear solutions
- Steam turbines
- Centrifugal and axial compr
- Electric-motor driven and int compressors
- Reciprocating compressors
- Turboexpanders and hot gas
- Process, control and safety v
- Centrifugal pumps
- Integrated solutions for CO2
- Modular solutions for compr power generation
- Service and digital solutions
- Learning & Skills developmer

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TPS product & service portfolio



Onshore & offshore production

In On- & Offshore applications we provide solutions for hydrocarbon production to help our customers extract, gather, treat and process resources and prepare them for delivery to midstream facilities.

Our product portfolio includes:

- Gas turbines
- Steam turbines
- Centrifugal and axial compressors
- Reciprocating compressors
- Electric-motor driven and integrated compressors
- Subsea compressors
- Process control and safety valves
- Centrifugal pumps
- Gear solutions and bearings
- Control systems
- Turnkey modules for compression and power generation
- Plant optimization apps
- Comprehensive services and support



Pipeline & gas processing

In the Pipeline & Gas Processing space, we offer a broad range of solutions in order to transport hydrocarbons and refined products from production sites to consumption territories, through various applications such as oil & gas gathering, boosting, processing and treatment, as well as their storage, metering and distribution.

Our product portfolio includes:

- Gas turbines
- Centrifugal and axial compressors
- Reciprocating compressors
- Electric-motor driven and integrated compressors
- Process control and safety valves
- Gear solutions and bearings
- Centrifugal pumps
- Control systems
- Turnkey modules for compression and power generation
- CNG for distribution applications
- Plant optimization apps
- Comprehensive services and support
- Waste heat and pressure recovery systems



LNG

In LNG we offer a broad range of technology solutions from gas liquefaction to regasification, supply equipment and/or modules for refrigeration, power generation, flash gas/ boil-off gas compression.

Our product portfolio includes:

- Gas turbines
- Steam turbines
- Centrifugal and axial compresso
- Centrifugal pumps
- Process control and safety valves
- Gear solutions and bearings
- Control systems
- Small scale CNG and LNG
- Turnkey modules for compressio power generation
- Plant optimization apps
- Comprehensive services and sup

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Integrated Compressor Line (IC

Proven zero-emissions compression for industry-wide applicat

How does it help?

With its 4 million hours of successful operation over 15 years, ICL provides clean, efficient and cost- effective compression applications to an industry that has growing demands for highly efficient and clever system solutions.

Main product advanta

Proven zero-emissions comp in a compact and efficient pa that's ideal for offshore platfo and other limited spaces.

Who is already using icl?

OGE (Open Grid Europe) and TAG (Trans Austria Gasleitung GmbH)

See PR here.

What's the availability

With 40% lower requested maintenance than conventio compressors, ICL provides exceptional reliability and av no matter where it's Installed while producing zero emissio

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Integrated Compressor Line (IC

Small and light

By saving up to 60% in space and footprint, the ICL can reduce structure cost, avoid additional deck space requirements, or limit platform size requirements.



Proven versatility an reliability

Instead of a combustion en has a high-speed electric m fully integrated with the co in a single sealed casing. It' efficiency induction motor, four million hours of succes operation over 15 years.

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Integrated Compressor Line (IC

ICL is ideal for offshore platforms and downstream facilities

- Low operating cost
- Compact and lightweight configuration
- High flexibility and wide operating range
- Easy installation and low maintenance
- Zero emissions and low noise

Offshore

Pipeline compression

Storage and other onshore applications

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API618 reciprocating compress

The perfect mix of high reliability and low maintenance, for any

How does it help?

Rugged design to meet the most severe operating conditions in a wide range of petrochemical and refinery applications, customized to project requirements

Main product advantages

Renowned for low pulsation and vibration—which translates directly to exceptional efficiency, smooth operation, low maintenance, and low power consumption.

Who is already using API618 recips?

Shell, ENI, Petronas
BP,Repsol, Reliance,Exxon, Phillips,
Dow Chemichal, Sasol

What's the availability?

Available for a wide range of applications where heavy duty machines are required. Best fit for refinery and petrochemical services.

Fully balanced design available for offshore applications

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API618 reciprocating compress

Flexible modular designs for long-term reliability and minimized costs

Used in a wide range of refinery, petrochemical and natural gas applications—including LDPE, hydrocracking, ammonia, refrigeration, re-injection and gas lift.

Proven design



Our proven modular design 1 to 10 cylinders on a single a cylinder size of up to 1,250 Machines range from 100 kW with pressure capabilities u bar. There are 10 models to from with designs and mat optimized for each applicat

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API618 reciprocating compress

The right fit for every application

No matter what the application or unique site challenges, we can supply a fully integrated solution including motor, vessels, piping, supports, and control panel.

Frame	Throws
OA	1
HA	2-4
HB	2-4
HD	2-6
HE	2-10
HE-S	2-6
HF	2-10
HG	2-10
SHM	2-6
SHBM	2-4

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BCL centrifugal compressor wi
Ratio (HPR)

Our smallest and lightest-weight compressor yet

- Up to 50% smaller train footprint than traditional configuration
- Up to 30% lighter weight
- Up to 5% less power consumption
- Up to 3 sections (@ 2 intercoolers) in 1 casing
- Max. operating pressure: 400 bar (5,800 psi)
- Pressure ratio: up to 30:1 (with natural gas mol. weight 20)
- Max. flow: 300,000 Am3/h (254 MMSCF/D)
- Simplified installation
- Higher reliability and availability due to less auxiliary equipment
- Lower downtime and easier maintenance
- Wide revamping flexibility

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LM6000-PF+: profit from best-i

Delivering cleaner, reliable, cost-effective power generation

- 54.3MW ISO rating 42.7% simple cycle efficiency
- Excellent reliability of 99.6% and availability of 98.4%
- Lightweight and modular design for optimized transport, installation, and maintenance
- Proven DLE combustion technology with over 30M hours of experience. Dual fuel capability
- Ideal for LNG: high thermal efficiency and starting torque
- Excellent fuel economy with lower emissions and fuel flexibility
- Providing 22% more power from an existing and proven platform



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LM2500+G5

Injecting technology to build on the LM2500 family legacy

Power

ISO: 38 MW @ 41% efficiency

Emissions

Improving on DLE 1.5 Technology to deliver 25ppm at full power or 15ppm if derated to G4 power

Availability

Technology injection and extensive test plan to deliver 25k/50k maintenance intervals at full power or 36k/72k if derated to G4 power

Durability

Injecting extensive durability improvements, backed by the most extensive testing and validation program ever performed on the LM2500 family

Upgradability

Direct replacement for Gas Generator (same flange-to-flange dimensions) with modifications to Power Turbines



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LM9000: proven in the sky, a br

Highest availability (>99%) and best-in-class total cost of ownership

Evolved from the GE90-115B, Boeing's 777 engine for over 14 years with 50 million flight hours and 99.98% departure reliability

ISO performance

- 65 MW power output
- 43% SC efficiency

Emissions

- 15 ppm NOx (gas)
- 25 ppm CO (gas)

Maintenance intervals

- Hot section: 36,000 hrs
- Overhaul: 72,000 hrs

Free power turbine

- Nominal 100% speed: 3,429 rpm
- Speed range 70 to 105%

Combustion system

- DLE 1.5
- 30-54 MWI gas fuel



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Digital Solutions (DS)

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Digital Solutions markets serve



Oil and gas

- Condition monitoring
- Control solutions
- Inspection technologies
- Measurement & sensing
- Process & pipeline solutions



Power generation

- Condition monitoring
- Control solutions
- Inspection technologies
- Measurement & sensing



- Conditi
- Control
- Inspecti
- Measur

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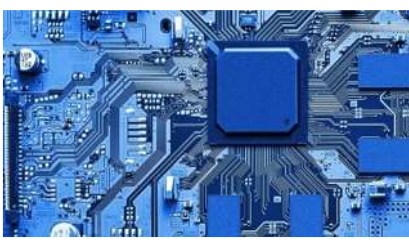
Digital Solutions (DS)

A global leader intelligent, connected technologies to sense, monitor, control, and inspect.

- ~8,200 employees
- Operating globally with major facilities in the U.S., Germany, Ireland, U.K., Belgium, Norway, UAE, China, Korea, Singapore and more
- Five product companies, comprised of 19 product lines
- 12+ manufacturing facilities, 40+ global facilities
- Headquarters: London, U.K.



Bently Nevada condition monitoring and protection



Inspection technologies

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Digital Solutions product & serv

A horizontal solutions provider

40%
Oil and gas

30%
Power

22%
Automa
and othe



Bently Nevada condition monitoring and protection

- Condition monitoring and protection devices
- Advanced machinery diagnostic software solutions
- Technical services



Control Solutions

- Control systems
- Industrial Cybersecurity
- Technical services



Inspection technologies

- Ultrasonic
- Film
- Radiography: X-Ra and CT
- Remote visual inspection
- Industrial inspecti software

5 product companie

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OptiComp compressor control

Match compressor performance to process demand—safely and effectively

OptiComp™ provides advanced compressor control for improved anti-surge protection and performance efficiency. It's a proven solution with over 600 installations across the global oil and gas industry.

- Comprehensive and scalable solution, with superior control software running on our fast and reliable Mark™ VIe platform:
- Integrated turbine-compressor control
- Surge control
- Load sharing/performance control
- Enables control and protective functions to be extended beyond the core machine/train, to associated auxiliaries up to and including the entire station/plant

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Ranger Pro

A reliable, wireless solution to complement reliability/maintenance strategies

This low-cost entry into condition monitoring is a reliable, online solution to complement reliability/maintenance strategies.

- Truly wireless
- Provides 24/7 coverage of monitored assets—for rotating assets with medium and low criticality. Captures velocity, acceleration, temperature
- Waveforms, full S1, add protocol(s), Predix™ edge deviceISA100 protocol
- ATEX Zone 0
- D-cell battery
- Modular

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Sentinel LCT8 ultrasonic flowm

Delivering pipeline peace of mind

With four additional ultrasonic paths, the Sentinel LCT8 flowmeter performs in the harshest pipeline conditions, delivering reliable performance in leak detection, custody transfer + allocation measurement applications. LCT8 spells peace of mind in pipeline asset protection, performance, and profitability.

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Speed|scan CT 64

Automated high-speed CT for 3D mass production process control

- Typically scans up to several hundred times faster than conventional fan-beam CT
- Up to 100% dimensional control, defect analysis, and classification of large castings up to 500x900 mm
- Productivity and quality gains due to 3D automatic defect recognition (ADR)
- New: optional fully automated loading and unloading for inlineCT



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Process & Pipeline Services



Subsea pumping module connected to customer ROV



Gas transfer equipment on location



VECTRA tool ready to launch

Pipeline services

Key services

Pre-commissioning

- Engineering
- Flooding, cleaning and gauging
- Testing
- Conditioning
- Subsea services
- Umbilical services
- Commissioning—product first fill
- Site preparations

Maintenance

- Mechanical cleaning
- Gel cleaning
- Chemical cleaning
- Testing and revalidation
- Nitrogen services
- Gas transfer/recompression
- Temporary flaring
- Temporary isolations
- Temporary pumping
- Pig manufacture

Pipeline inspection

- Internal geometry inspection
- Mapping
- Corrosion and crack detection
- Ultrasonic pipeline inspection

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Process & Pipeline Services

Our portfolio of services helps you confidently manage the lifecycle of your asset: delivering timely and stress free start up, supporting day to day reliability and controlled decommissioning.

The mutual goal—safe operations, asset integrity and enhanced profitability.

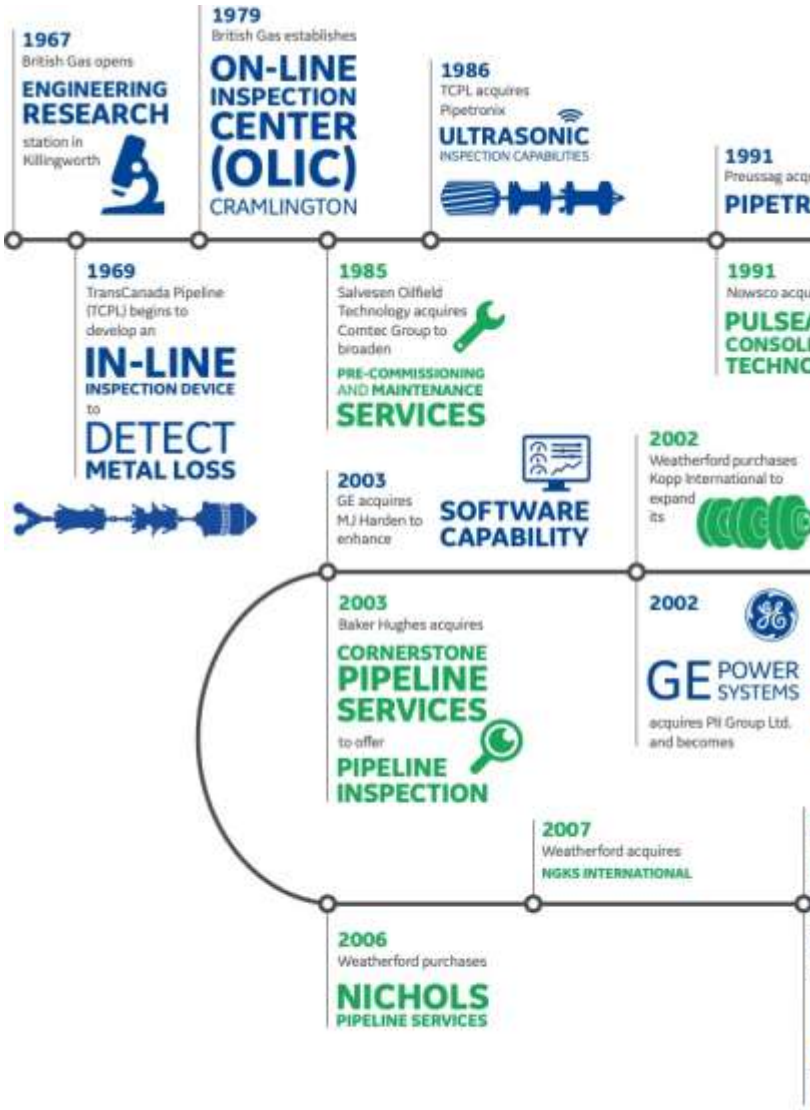
Delivering a unique portfolio of:

- Pipeline and process pre-commissioning and maintenance services
- Inline inspection and integrity services



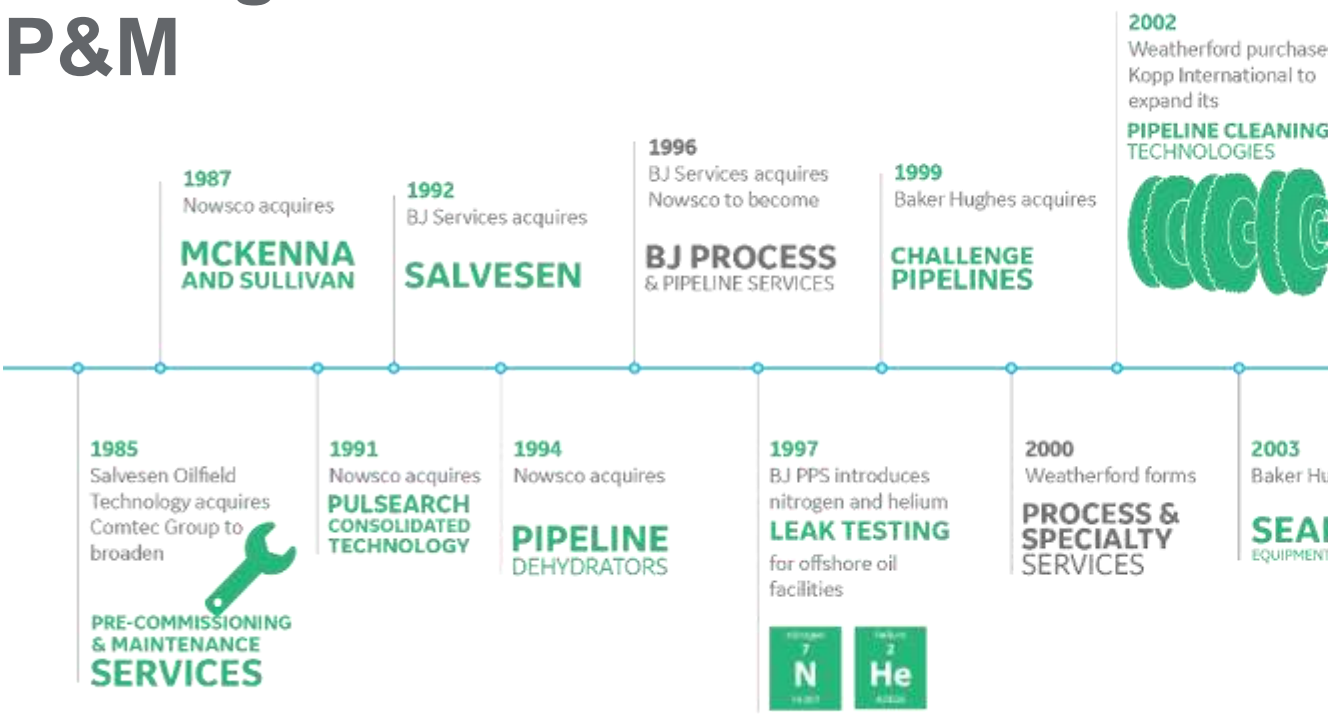
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Process & Pipeline Services Heritage - ILI



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Process & Pipeline Services Heritage – P&M



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Corrosion and metal loss

VECTRA™ GEMINI HD

- 20″ to 48″. MFL, Caliper & IMU technology
- Tri-axial sensors, 1.5D, speed control NPS24+



MagneScan™ **SHRP**

- 6″ to 52″. MFL, Caliper & IMU technology
- Tri-axial sensors, 1.5D, heavy wall
- SHR & HR resolution configurable



UltraScan™ **WM**

- 6″ to 42″. Ultrasonic wall measurement technology
- Pinhole specification with WMP



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Corrosion and metal loss

TranScan™ **TFI**

- 8 to 30". High resolution axial MFL and Caliper
- Detect axial flaws with confidence



MagneScan™ **HR**

- 6 to 56" High resolution axial MFL, Inertial, Caliper
- Dual diameter and heavy wall options



VECTRA™

- 12" to 48". MFL & IMU Technology
- Tri-axial sensors, 1.5D, heavy wall, speed control 24" +



CPIG™

- 4" to 48". High resolution axial MFL, Caliper, IMU Technology
- Dual diameter and difficult to pig pipe pipelines



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Crack detection

UltraScan™ **CD/ CDP/ CD Edge**

- 10″ – 34″. Ultrasonic technology
- High speed capabilities, industry leading accuracy
- EDGE gives superior small crack detection (15mm)



UltraScan™ **DUO**

- 24″ to 36″. Phased array technology
- CD and WM capabilities.
- The highest performance ILI technology for advanced crack defect morphologies - replaces



EmatScan™

- 24″, 26″, 30″, 34″, 36″. EMAT technology
- Unrivalled POD of critical crack features
- Unrivalled POI performance means less digs
- Deployment in gas lines & liquid lines.
- Cracks in dents



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Geohazard and third party dar

GEOPIG™

- 8″ to 48″. Caliper & IMU technology
- High resolution caliper, 1.5 D
- Dent Strain



CalScan **EP™**

- 10″ to 48″. Caliper & IMU Technology
- Line proving
- Dent strain



PROFILE™

- 12″ to 48″. Caliper technology
- Line proving for MFL/UT, robust, 1.5 D – 3 D, construction surveys



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Maximum data accuracy for p

Get a sharper view, more accurate data, and increase your confidence in your pipeline integrity with MagneScan™ SHRP, VECTRA™ HD and VECTRA™ HD Gemini

- > 90% confidence interval specifications
- Detecting and accurately sizing pin-holes and axial slots (channelling)
- Pit in pit identification & sizing
- Complex corrosion
- Integrated threat reporting options
- Girth Weld and Spiral Weld Assessment (GWA/SWA): detection, classification and sizing of GW/SW anomalies

Save money where it has the most impact— reducing unnecessary digs with reliable data



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Getting to the bottom of pits ar

UltraScan™ WMP super-high-resolution ILI tool delivers significantly higher axial, radial and circumferential resolutions to improve both the detection and sizing of pitting and pinhole corrosion.

It allows for higher confidence in developing immediate and short-term repair schedules, while long-term remediation activities and re-inspection intervals can be substantially improved.

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CPIG™ for low pressure, difficul dual diameter pipelines

Combination technology:

- Acquires metal loss, caliper and inertial data in one run
- Enhances consistent and correct anomaly classification
- Navigates multiple 1.5D back-to-back bends and bore reductions up to 25%
- Runs effectively in some pipelines previously considered unpiggable
- Eliminates most pipeline, launcher, or receiver modifications

Your solution for challenging and unpiggable pipelines



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TranScan™ TFI

The innovative TranScan™ inspection tool detects long, narrow defects that run parallel to the axis of the pipeline. This ensures that axial flaws (cracks and elongated metal loss) present their largest dimension to the magnetic flow, creating a strong signal from flaws that have previously been invisible to magnetic tools.



- Pre-1970 ERW seam welds – hook and lack-of-fusion cracks
- Seam weld defects
- Narrow axial corrosion
- Preferential seam weld corrosion
- Axial laps

A key technology for pipeline verification and validation

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Driving enhanced pipeline safe
UltraScan™ CD EDGE

- Latest generation crack detection tool
- Innovative design, 70% + sensors delivers significant improvement in crack detection
- 'Sees' defects as small as 15mm/0.6 in. (less than diameter 1 cent Euro)
- Drive confidence in pipeline integrity decision making



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Raising the bar for crack detec
EmatScan™ CD

Targeted use for in gas pipelines, our EmatScan™ CD is ideally suited to detect a full range of crack-like features including;

- SCC colonies
- Sub-critical SCC
- Longitudinal fatigue cracks
- Toe and hook cracks
- Lack-of-fusion cracks
- Cracks in or adjacent to long seam weld

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Managing crack related threat

Cracking is the most severe type of defect in a pipeline. Crack growth rates can be fast and failure often results in a rupture event.

Our PICA (Post Inspection Crack Assessment) solution applies industry best practice crack assessment methodologies to assess reported features and provides a rigorous and fully documented ECA (Engineering Critical Assessment). Our five products include:

- Crack Profiling
- Crack Assessment
- Lamination Assessment
- Crack Comparison
- Crack Susceptibility

Long term proactive integrity management avoiding costly & unnecessary repairs



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Manage geohazards with GEOP

Slope instability, frost heave, subsidence, flooding, upheaval, or construction practices can result in residual and induced bending strain

GEOPIG precisely measures the changes in bending strain resulting from pipeline movement and pipeline centerline location.

High resolution caliper accurately measures and identifies any associated dents, wrinkles, buckles, ovality or other geometric anomalies.

Offshore out-of-straightness surveys

Depth of cover determination



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Evaluating mechanical damag

In a non-fatigue environment, strain is the best indicator of severity and imminent failure of dents.

Our PIDA (Post Inspection Dent Assessment) study provides the following benefits;

- Effective and realistic assessment of the fatigue risk from dents located on a pipeline
- Minimize current and future risk of dent failure for latent dents
- Avoid costly and unnecessary evacuations and repairs whilst maintaining safety



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Economically identify and mea strain-related pipeline threats

Until recently, axial strain could be measured only in areas thought to risk, or through monitoring program in areas already subject to dama leaving the risk-level of large portions of pipeline essentially unverified

Now there is a better option. The innovative AXISS™ axial strain measu the first technology capable of providing a continuous measurement strain variations along a pipeline's length:

- Combines with our MFL inspection technologies for a comprehensive strain analysis of large areas of at-risk pipeline
- Measures small changes in strain conditions over the lifetime of the and decreases the need for costly, continuous monitoring using stra gauges or other techniques

The only choice for a comprehensive total-strain analysis inspection

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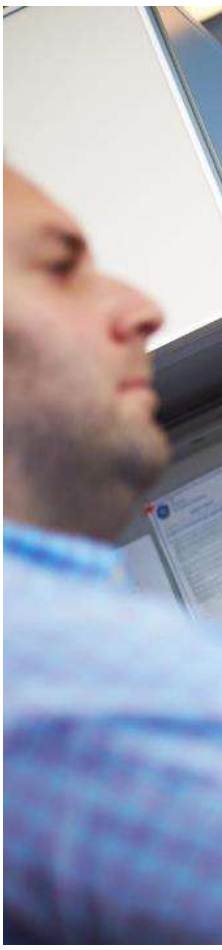
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Corrosion growth comparison

Corrosion growth is complex, highly variable and location specific.

RunCom™ compares individual defects at the signal level on repeat runs to quantify location specific rates.

- Enables optimization of repair and re-inspection planning on economic and safety basis
- Proactively prevent leaks and failures
- Reduce costs—best in class matching accuracy and repeatability minimises conservatism



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Adding value to ILI reporting th purpose

Find peace of mind

The cost effective and safe strategy based on ILI findings

The Fitness for Purpose (FFP) assessment provides proactive rather than reactive corrosion management, telling the operator the what, where, when and why?

This long term integrity management strategy, optimizes repair and reinspection planning safely with enhanced profitability in mind.



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Tipping the scale from risk to re

At the heart of a risk-based pipeline integrity management system (PIMS) is PipeView™ Integrity (PVi)—a suite of proven software tools designed specifically to manage, evaluate, and cohesively report on all the different data collected for pipelines.

It allows the organisation to quantify risk and improve decision-making by all business functions and can reduce annual inspection costs by 31%*.



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Reducing plant turnaround cos

SMART CLEAN decontamination services deliver performance with unyielding attention to safety and environmental compliance.

- Proven chemical cleaning products and environmentally sound cleaning
- Reduce need to process, store, or remove hazardous waste
- Safe, on-time vessel entry so that turnaround schedules are met or shortened.
- Increase hydrocarbon recovery for reprocessing without adversely affecting operations
- High performance industrial cleaning chemistry, targeting-specific cleaning needs
- After application, workers can then quickly and safely enter these vessels and tanks for inspection and repair.

Fast, effective equipment cleaning



*App
and H
refine

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SMART CLEAN* decontaminatio

Safe vessel entry

- Minimal exposure of people to hazards
- Environmental impact
- Proper handling and disposal of waste
- Reduced environmental risk
- Reduced total cost of operation
- On-time unit handover

Benefits of using PPS

- The only decontamination process to eliminate pyrophoric risk
- Industry advocated high-performance industrial cleaning chemistry
- Minimizes post-cleaning hazardous waste volumes
- Mobilized and trained competent workforce



*App
and H
refine

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Pipeline pre-commissioning*

Engineering, flooding, cleaning and gauging, testing, condition commissioning—product first fill.



Deepwater projects

- Widely recognized subsea technology with the Denizen™ product range including a bespoke coiled tubing downline system
- Experience in all deep water arenas around the world, e.g. Liwan, Lula, OCTP, West Hub, TEN, Kizomba, Ichthys, Hadrian south, Jack St Malo
- Continuous development of subsea technologies
- Umbilical services



* Subsea pipelines, land-based pipelines, subsea umbilical's, risers and flowline (SURF) systems

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Umbilical services

We provide complete turnkey services for pre-commissioning and commissioning umbilical systems from load-out at the manufacturing facility to installation.



- Hydraulic monitoring during transit
- Hydraulic monitoring during lay
- Flushing, pressure testing with system fluid
- Continuity Resistance (CR)
- Insulation Resistance (IR)
- Time Domain Reflectometry (TDR)
- Optical Time Domain Reflectometry (OTDR)

Our objective expertise and unmatched experience ensure cleanliness and integrity whilst verifying lines conform to predefined specifications.

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Pipeline maintenance

Mechanical cleaning, gel cleaning, chemical cleaning, testing a transfer/recompression, temporary flaring, temporary isolation



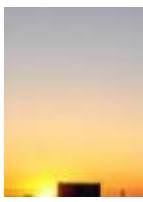
Cleaning

- Tailored cleaning solutions to keep pipelines at optimum operating conditions
- Mechanical and chemical cleaning
- GelPig™ cleaning offers significant debris recovery including 'black powder' recovery, wax and other deposits
- General maintenance/routine cleaning
- Cleaning in readiness for 'ILI' campaign as 'turnkey' offering



Isolations

- Localized repairs within pipelines enabled
- Isogel valve sealant
- High differential pressure pig trains. Pipe freezing is a method of temporarily isolating a pipe by applying a freeze jacket and circulating a cooling agent (liquid nitrogen). The contents within the pipe are chilled to create a solid, frozen plug with pressure holding capabilities
- Used in valve change outs and pipeline revalidation



Enviro

- Safe han custome atmosph
- Tempora mounted
- Gas reco
- 2 or 3 ph
- High pres equipme

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Gas transfer

PPS has the ability to transfer natural gas from one system or pipeline to another at discharge pressure of up to 100 barg and to a residual pressure approaching 0 barg (gravity).

Our market leading gas compressors have greatly enhanced the effectiveness of the service, increasing the recovery volumes and reducing transfer time.

Our gas transfer service utilizes two types of equipment:

- High Pressure (HP) compressor: 7 to 100 barg
- Low Pressure (LP) compressor: 0 to 28 barg
- High Pressure (HP) + Low Pressure (LP): 0 to 100 barg



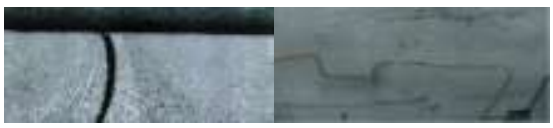
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Inline inspection and integrity s



Corrosion and metal loss

- General, complex corrosion
- Pitting, pinholes or laminations
- Dents with metal loss
- Clean baselines, few defects
- Lost integrity
- Direct comparisons of corrosion growth between inspections



Crack detection

- Pipeline with propensity for seam and girth weld cracks
- SCC cracks of unknown gestation and failure state
- Extensive SCC crack fields populated with both critical and subcritical cracks



Geohaz damag

- Internal c
- Bends, ov
- Construc product t
- Dents wit
- Inaccura
- Missing r
- Excessive line ruptu
- Large co cause bu

Enabling products

- MagneScan, VECTRA, VECTRA GEMINI
- UltraScan WM/WMP
- UltraScan DUO
- TranScan TFI
- CPIG
- Runcom, Fitness for service, Pipeline risk assessment

- EmatScan
- UltraScan CD, CDP
- UltraScan CD EDGE
- UltraScan Duo
- TranScan TFI
- Pipeline risk assessment, IMU strain, PICA

- PROFILE, C
- GEOPIG
- MagneSc
- ThreatSc
- Pipeline r Fitness fo

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Pre-commissioning & commissioning services

Pipeline services

Pre-commissioning | Maintenance | Pipeline inspection (ILI)

- Flushing and jetting
- Air blowing
- Chemical cleaning
- Oil flushing
- Pigging
- Camera inspection
- Laboratory services

Debris free start-up

- Air drying
- Nitrogen drying
- Vacuum drying
- Accelerating cooling
- Accelerated heating
- Inerting

Plant conditioning



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Pipeline pre-commissioning

Mechanical and chemical cleaning, pressure testing, leak testi nitrogen purging, gas transfer and flaring.



Nitrogen services

- Identifies leaks in excess of predetermined spec
- Industry's preferred method of checking joint integrity and preparing hydrocarbon process facilities for leak-free start up
- Frees the system of oxygen prior to start up



Hydrotesting

A strength test is always required for new piping and associated vessels to ensure the following

- Safety
- Reliability of operation
- Leak tightness of pressure systems

All work is conducted under rigid procedures and according to code, ensuring total control at all times.



Air services

- Variety of effective drying techniques for process systems that are sensitive to moisture
- Suitable for complex plant configurations with multiple vent points
- Equipment can be cross-utilized for air blowing, pneumatic strength testing and purging (w. membrane nitrogen)



Chemica

- Environme non toxic hazardou
- Non class CEFAS ap Band).
- Degreasir passivatio
- Cleaning compress associate assembly

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Pre-**commissioning of the worl** largest offshore gas pipeline

The ground breaking Nord Stream pipeline project, comprised of two 1,224km long, 48-in. diameter twin gas transmission pipelines running from Russia to Germany– a delicate marine environment that needs to be protected and preserved.

The world's longest-ever single-section dewatering operation, including the longest travel distance for tie-in sealing tools. Establishing a concept, engineering and planning, selecting a main water source and water treatment regime, and identifying risks were among the tasks project managers undertook.



The entire process was helped by a specifically designed equipment spread

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Saving time and money with SAVAS and HP Smart Gauge To



Scenario

Before you can perform a hydrostatic test on a new subsea pipeline, you must first confirm the pipe's internal bore. This requires a gauge plate mounted on a bi-directional (bi-di) pig to run through the pipeline and into the receive trap.

Traditional procedures require the operator to have time consuming deployments of a ROV, receiver head recovery and redeployment after gauge plate assessment as well as vessel movements between locations.



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Process maintenance

Mechanical and chemical cleaning, pressure testing, leak testing, drying, nitrogen p
machining, camera inspection, gas recompression, foam inerting, preservation, oil



Nitrogen services

- Prevent loss of production due to unplanned shutdowns
- Industry's preferred method of checking joint integrity & preparing hydrocarbon process facilities
- Can be engineered, planned and scheduled in advance to minimize impact on concurrent work



Drying services

- Variety of effective drying techniques for process systems that are sensitive to moisture
- Suitable for complex plant configurations; multiple vent points
- Equipment can be cross-utilized for air blowing, pneumatic strength testing and purging (w. membrane nitrogen)



Reactive chemical cleaning & decontamination

- Environmentally friendly non toxic and non hazardous cleansing fluids
- Non classified and carries CEFAS approval (Gold Band
- Degreasing, descaling, passivation
- Cleaning of critical compressor/turbine associa pipework post assembly
- Decontamination and tank cleaning

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Maintenance & shutdown serv

Pipeline services

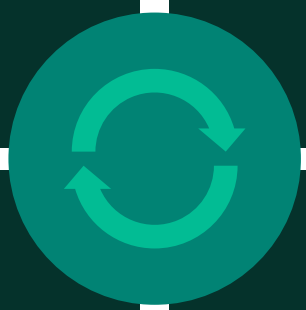
Pre-commissioning | Maintenance | Pipeline inspection (ILI)

Debris free start-up

- Flushing and jetting
- Air blowing
- Pigging
- Camera inspection
- Decontamination

Plant conditioning

- Air drying
- Nitrogen drying
- Vacuum drying
- Accelerating cooling
- Accelerated heating
- Inerting



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Increased safety and reduced costs with our tank cleaning se

Treatment options

- Batch treatment to rapidly reduce sludge in tanks and reduce tank turnaround costs
- Continuous treatment to slowly reduce sludge; reduce water, salt and solids to the CDU; allow processing of difficult opportunity crudes and reduce CDU operation costs
- Offline clean to clean up remaining sludge and allow vessel entry



Benefits

- Lower costs and reduced manpower
- Recovery of viable “re-run” feedstock, blendstock and marketable fuel

Minimized hazardous waste disposal & cost

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Increased safety, improved recoveries turnaround time with our tank cleanin

- Heat and horsepower only transfer the problem from one tank to the next
- Baker Hughes specialty chemicals applied during the initial mixing stabilize the hydrocarbons so they remain as a liquid recoverable hydrocarbon
  - Maximizes recoverable hydrocarbon yields
  - Allow wastewater to be processed through the refinery WWTP with no adverse effects
  - Solid inorganic waste is generally non hazardous waste
  - Provide shorter turnaround times when compared to standard mechanical methods
  - Reduced safety concerns as there is no manned entry until tanks are gas free



Minimized hazardous waste disposal & cost

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Mechanical joint integrity and in situ machining

- MJI supplied to client base through construction into commissioning
- Supply of hand, hydraulic torqueing and hydraulic bolt tensioning
- Equipment to cover ½"NB to 36"NB flanges and clamps in all class's
- Joint integrity management software package
- Technical support

On site machining includes:

- Flange facing ½" to 36"NB
- Pipe cutting ½" to 36"NB



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Mobile flaring services

Our innovative and cost effective service for safe flaring

Mobile flaring services

- Plant shutdown waste gas incineration
- Well testing H_2S incineration
- Gas flaring during well testing
- Incineration of H_2S or sulphur, CH_4, C_2 to C_6
- Degassing of tankers, storage tanks, or vessels
- Incineration of waste vapors or by-products
- Degassing of landfill sites

Main features

- Shrouded flame to minim disruption/heat radiation outside wall)
- Clean smokeless burn usi "variable flare tip" system
- Low noise thanks to the e flame (72dB @ 3 – 5 mt)
- Over 1,000ºC sustainable gas incineration
- Automated variable air d incorporated into stack

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Nitrogen services

Baker Hughes' nitrogen services reduce project time, risk and cost with efficient nitrogen usage onshore or offshore during new construction or turnarounds.

- Purging and blanketing
- Leak testing
- Accelerated cooldowns
- Drying

We ensure you have a clean, dry, leak-free, and inert unit ready to safely receive product the first time, according to industry standards. If temperature is an issue, we can precool or preheat your piping and vessels to the required level.



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Digital enablement

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Value creation through real dig



Field planning & optimization



Production optimization

Proce Mana

Maximize recovery

Optimizing access to the most hydrocarbons in place by integrating reservoir intelligence with:

- Well planning
- Drilling information
- Geomechanical modeling

Optimizing primary recovery

Secondary recovery optimization

Optimizi

Seconda



Platform enablement



Digital foundatio

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Digital transformation

We extract the power of data to improve operational productivity, efficiency, and safety.



BakerHughesC3.ai

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C3 joint value propositions

Baker Hughes

- Deep domain expertise
- Provide critical feedback to product development roadmap based on direct customer feedback
- Deliver value added services on top of software license sales
- Opportunity to leverage BHGE product companies
- Provide commercial flexibility often required from Oil & Gas customers
- Global sales and marketing teams to amplify market awareness and positioning
- Access to senior decision makers at major customers

Global reach and established

Access to senior leaders a
leading IOCs / NOCs

Combined expertise i
data analytics & AI



Highly trained team
of data scientists

Jointly demonstrated
ability to solve complex pro

Unique technology platf

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Case study—JewelSuite

Shell—adding Value to Upstream business

- Rapid iterations enabled by workflow-driven approach and rapid grid updates
  - Building a model from scratch can be done in 2 days with JewelSuite rather than 2 weeks using other modeling software
  - Updating an existing model takes just 1 – 2 minutes, even for a very large full-field model
- Improved predictive power through support for multi-concept uncertainty workflows
- Proven to be more predictive in greenfield and brownfield settings
- Improved integration within teams through a common data model and shared reservoir and fluid description

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Flexible partnerships & commercial models

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Flexible partnerships and com

Baker Hughes's partnership model mean we can tap the right established partners to meet our customer needs and project economics.

- Portfolio evaluation
- Exploration and planning support
- Concept—FEED
- SPS-SURF
- Pipelay and construction vessels

From assessment and project design to SPS-SURF solutions, our partnerships offer a comprehensive solution that reduces complexity, offers integrated solutions and accelerates speed to market—across subsurface, wells, and subsea for global customer projects spanning the fullstream.

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Case Study (Subsea Connect)

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Subsea Connect

Executive Summary

January 28, 2020

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Trends in Subsea

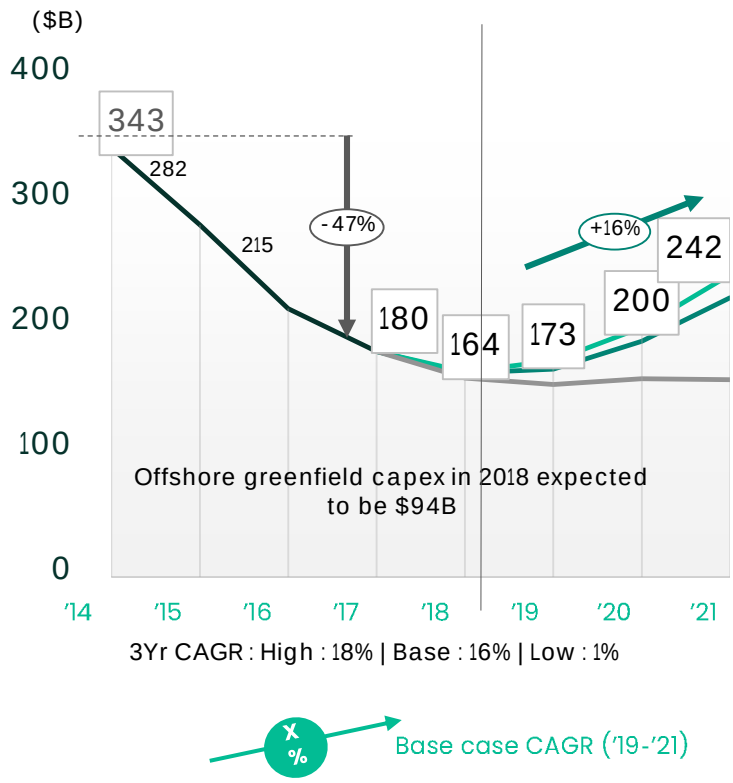
Subsea developments in the petroleum s

Market shifts	Shifts from shallow to deep and ultra deep Majors preparing for deepwater action at the right economics	Enhanced re brownfields New tie-back opportunities recovery fron investments
Change makers	The low carbon transition Operators looking for technologies and efficiencies to lower carbon emissions	Game chang Advanced te and intelliger engineering a architecture efficiencies

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Global offshore capital investm at a CAGR of 16% with Deepwat growth

Global offshore (E&P CAPEX)[1] '14 - '21



3Yr CAGR : High : 18% | Base : 16% | Low : 1%

X %

Base case CAGR ('19-'21)

G b

120,0
110,0
100,0
90,0
80,0
70,0
60,0
50,0
40,0
30,0
20,0
10,0

Sources:
(1) BHGE analy
assumptions: 2
Spend report (A
(2): Rystad D cu

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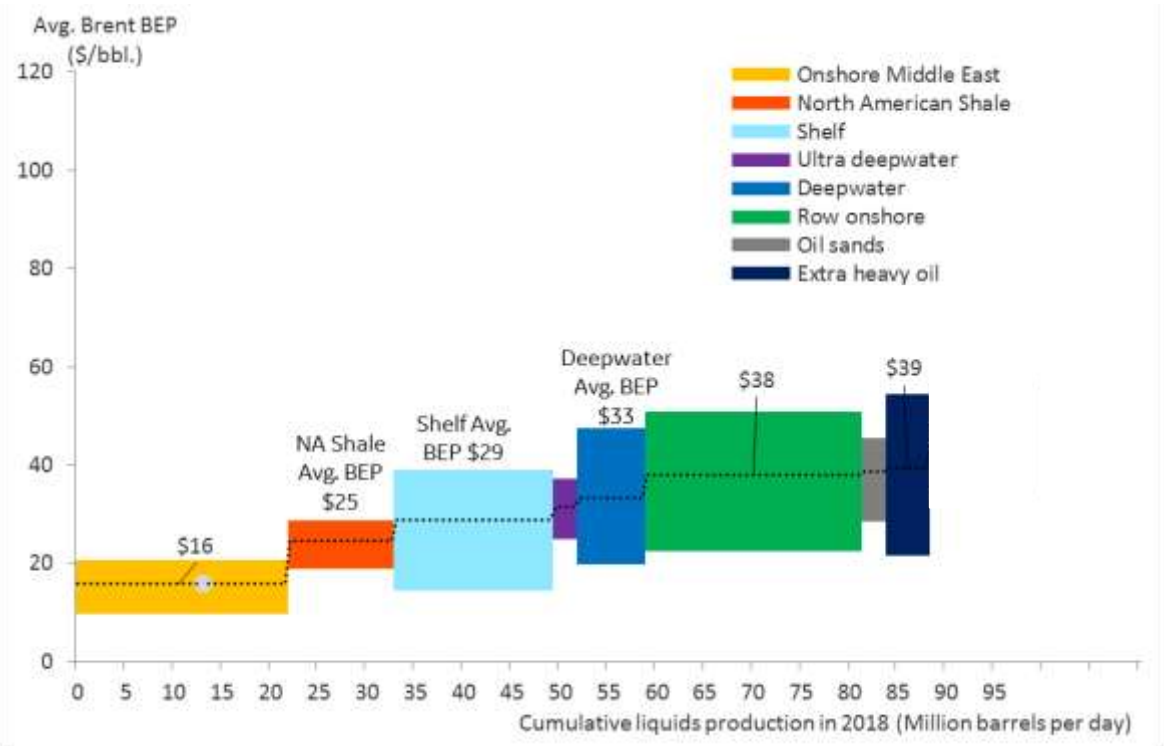
The industry has made significant progress in reducing breakeven costs for subsea developments.

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Breakeven costs have come do

Subsea developments in the petroleum s

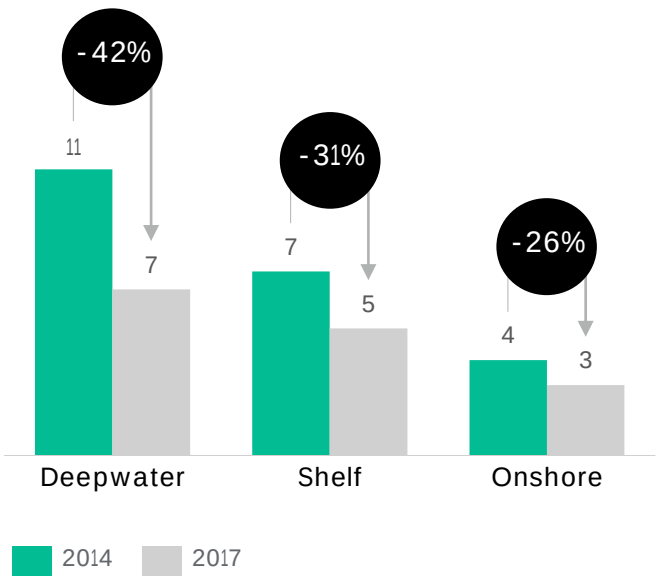
2018 Cost of Oil Supply—Sanctioned Projects[1]



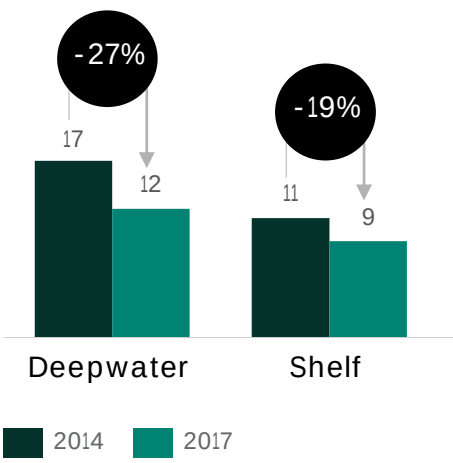
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Greenfield and Brownfield cost reduction trends

Greenfield development costs ($/boe.) by segment and year



Brownfield Production C ($/boe.) by segment an



From May 14, 2018 Rystad Bulletin - Edited and Published by Petroleum R 2018 Edition

Authors: Aditya Ravi, Senior Analyst & Lars Mikkel Reiersen, Analyst, Rysta

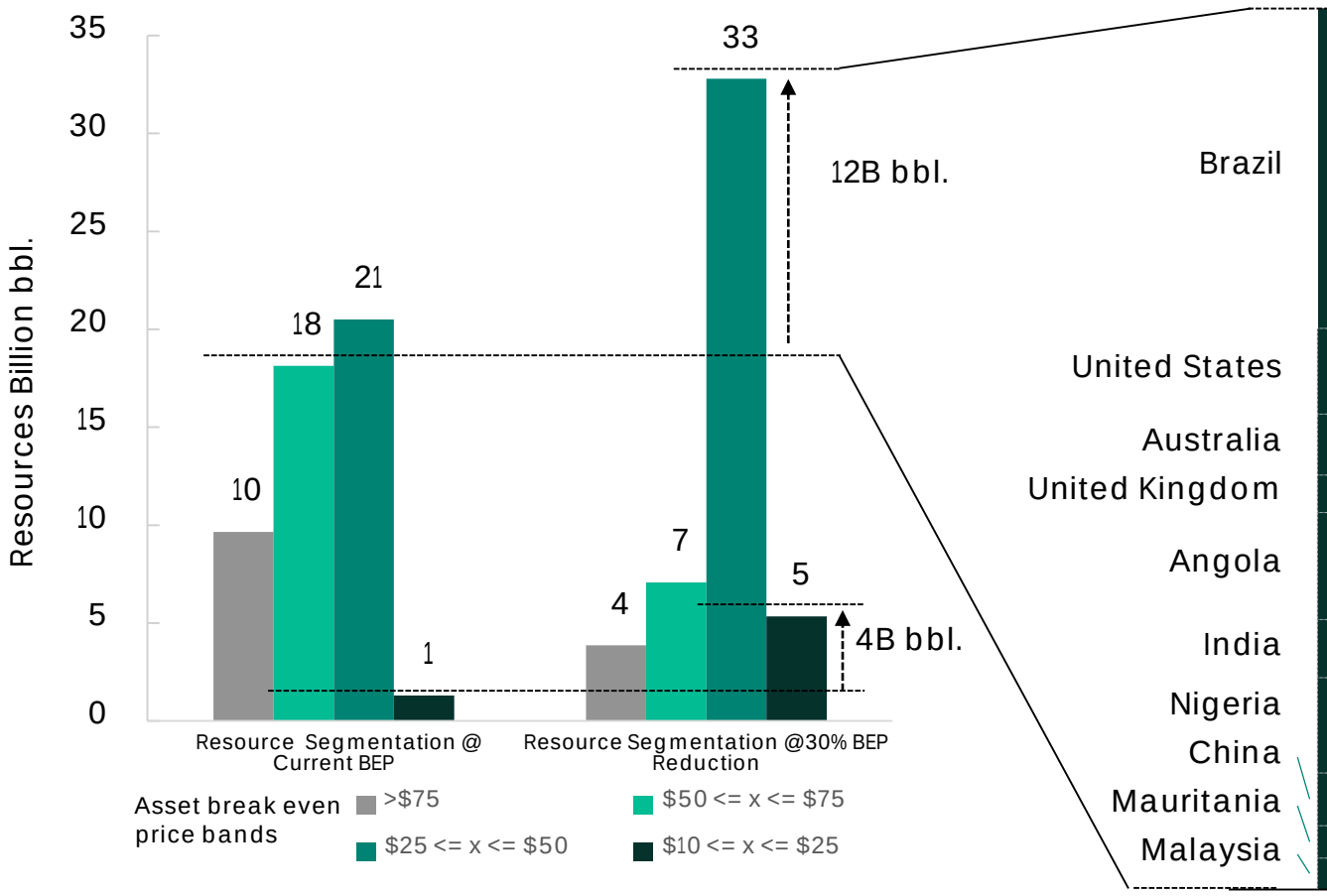
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We believe there's
more to do.

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Un
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20

Unsanctioned subsea projects 2018



Source : Rystad Ucube (October 2018), Brent oil price at $75

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To achieve this, we need a new
of doing business.

A new way to lower costs, incre
productivity and yield to lower
economic development point.

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Introducing Subsea Connect. Our vision for the future of subs

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Introducing Subsea Connect

Subsea Connect is a new way of doing business.

From the earliest stage, Subsea Connect takes the most comprehensive approach to configure projects to meet economic targets.

Better connections across the development process and more integrated solutions from the reservoir to topsides.

Reducing time and risk. Eliminating recycle. Increasing certainty.

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Subsea Connect reduces the economic development point by an average of 30%.

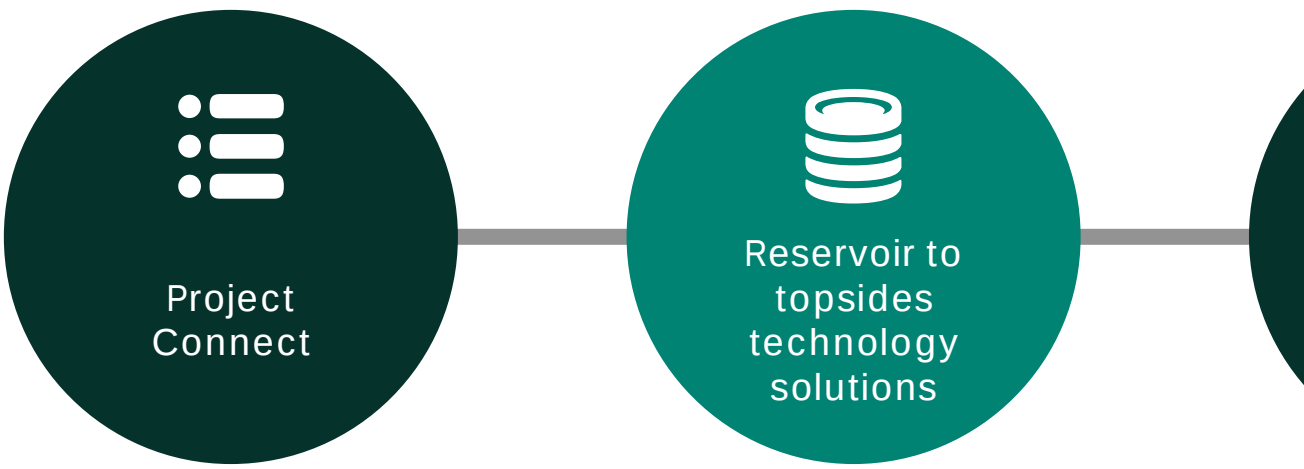
Add value to planned developments. Transform marginal uneconomic assets into opportunities.

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Introducing Subsea Connect: h

From concept to commissioning. From th topsides. Across the life of the field.

SUBSEA CONNECT PILLARS



Radically optimized

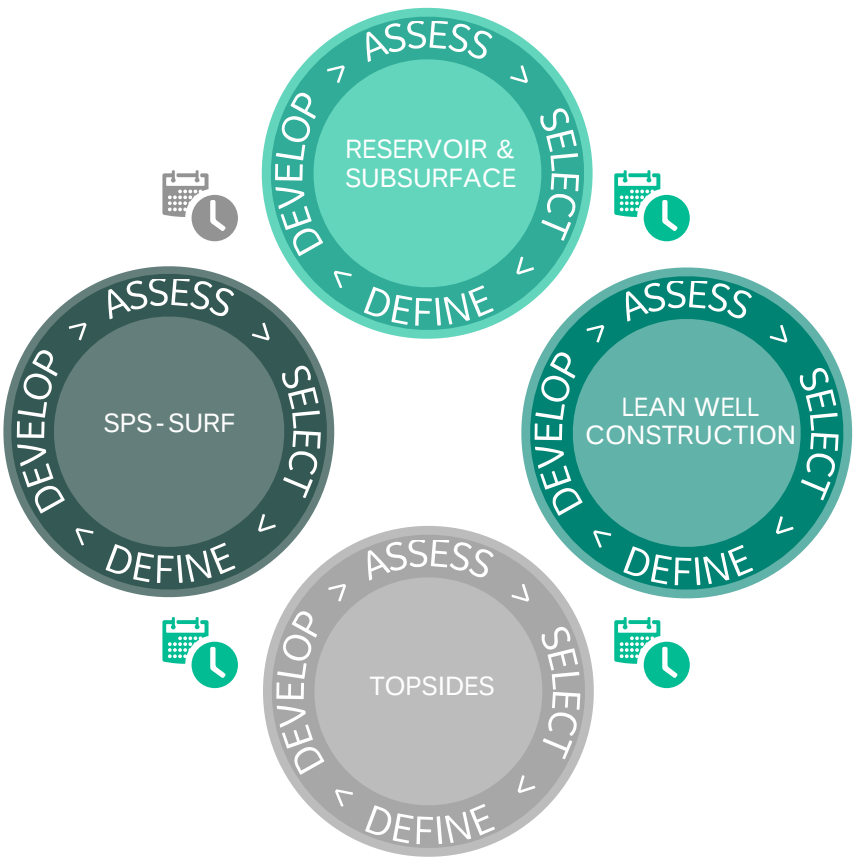
Outcome engineered

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It starts here.

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Project connect



Baker Hughes's independe
project workflow changes
way subsea projects are
developed by going beyo
early engagement with a
operator to reimagining h
projects are planned and
executed.

TRADITIONAL APPROACH

SUBSEA
CONNE

VS.

THE RESULT:

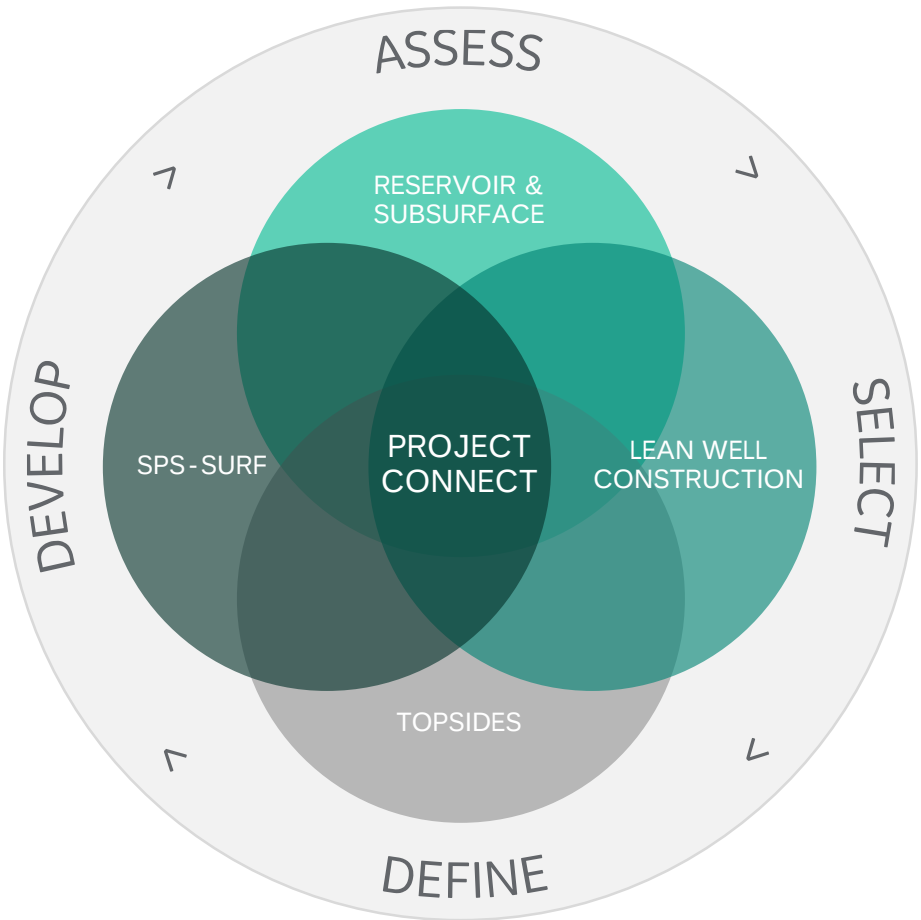
Lower cost

Increased productivit

Improved yield

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Project connect



Key features

- Economic ou assessment
- Parallel track "assess" pha
- 'All hands' de project team
- Independent managemer
- Technology s configuratio integration
- Flexible. Part solutions for needs

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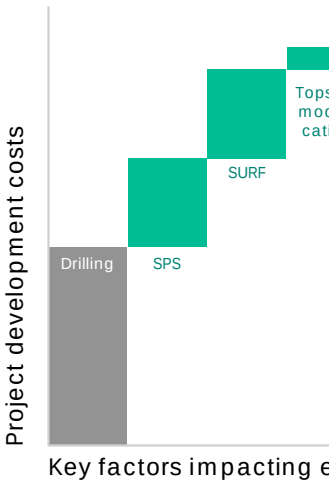
Case study

Subsea Connect transforms uneconomic North Sea asset: 3 well subsea tie back

Independent assessment process identifies opportunities for improvement

- Project stalled since 2015 due to poor economics
- Optimization—Baker Hughes and io Oil and Gas apply Subsea Connect independent assessment and Project Connect workflow, to identify project improvements—40% cost reduction
- Total Scope and Execution—line of sight to further 10% cost improvement identified through execution process
- Assessment showed earlier FID could be enabled

Impact of S
the econom



50%
CAPEX reduction

NPV improved
200%

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Reservoir to Topsides Technology Solutions for the life of the field

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Subsea Connect reservoir to to technology solutions

Baker Hughes fullstream: connecting a s each designed to improve productivity a

- Reservoir optimization and field development—Reservoir insights and optimization to enhance drainage and recovery over the life of the field.
- Aptara™ **TOTEX**-lite subsea systems—lightweight, modular technology re-engineered to cut the total cost of ownership in half and be more responsive to changes over the life of the field.
- Lean well construction—drilling to the technical limit; integrated with the rig to target a 20% reduction in well construction costs.
- Topside optimization and production enhancement—debottlenecking, gas handling and power solutions; extend asset life with no change in platform footprint to handle 25% more volume at minimal CAPEX.

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Case study

Reservoir optimization and field develop
Malaysia, Petronas D18

Baker Hughes capability

- Baker Hughes' Oilfield Services (OFS) Baker Hughes and market leading consulting partners (Gaffney Cline & Associates and io Oil and Gas) work across the fullstream oil and gas value chain, from reservoir evaluation to technology selection, and integration
- Technical competency and operational excellence—independent reservoir optimization and assessment, and field development planning
- Draw execution and supplier know how in as early as possible to help identify, then deliver value
- Software solutions—JewelSuite—turns data into actionable insights. Run multiple scenarios to analyze alternative possible outcomes at speed.
- Scale and expertise through portfolio of successful global projects. Leverage global relationships, synergistic partnerships.

Malaysia

- Deploy and fac for FDP
- Double two yea
- Extende
- Increas
- First-in-

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Case study

Lean Well construction Offshore Norway: Equinor

Baker Hughes capability

- Baker Hughes' Oilfield Services (OFS) product and services portfolio, including drilling, cement, fluids, completions, and wireline
- A dedicated Baker Hughes project management team adding value over pure bundled services
- Partnership between Baker Hughes, the operator, and the rig contractor

Equinor

- Offshore North Sea Contr
- Initial drilling campaign months ahead of plan
- All wells to date have be according to requiremer
- 50% cost reduction
- 'Moving Perfect' improve
- World record 17½' section

Customer value	Multiservice contract for well construction and project management	Improve safety Deliver "the perfec well"

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Case study

Optimized Topsides Shell Brent

Baker Hughes capability

- Baker Hughes's Turbomachinery and Process Solutions (TPS) product and services portfolio provides gas handling, debottlenecking, production enhancement, and power generation
- From conceptual to turn-key solutions—site preparation, system integration, construction, testing and transport, and installation
- Upgrade and TOTEX light replacement solutions to enhance production

Shell Brent case history

- Extending reservoir life—p matching of compressor reservoir
- 50% smaller footprint and weight compared to two units
- Doubled pressure ratio
- Leading edge technology impellers

Customer value		
	Production efficiency/improvement	Emissio
	Fuel/power savings	Smaller foot
	Life extension	Improved ava

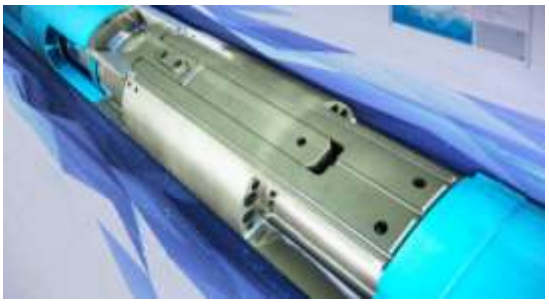
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OFS case studies



Developing new, sustainable operational models to greatly improve efficiency

Our customers are looking to the energy transition, and we have pledged to partner with them on this journey. We are working with customers like Equinor in the North Sea to transfer expertise from the rig to remote operations centers onshore, improving efficiency and decision-making while reducing HSE risks and carbon footprint.



SureCONNECT system allows operators to optimize performance, mitigate risks

Baker Hughes and BP deployed the SureCONNECT™ system in the Clair Ridge development offshore Scotland, marking the world's first multi-trip completion installation with fullbore fiber-optic capability. This is an immense milestone for BP's plan to improve surveillance data and well-performance functionality.



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Oilfield Services case studies

Accelerated operations by

30 days

Preventing downtime during Hurricane Harvey with DEEPFRAC

With Hurricane Harvey looming in the Gulf of Mexico, the DEEPFRAC™ deepwater multistage fracturing service helped a customer avoid downtime on a deepwater well. The well plan stayed on track and the service accelerated completion operations.



Using data-driven mod greater recovery in the Middle East

Detailed geological, geomechanical a studies on a mature gas field identifie untapped reservoirs. BHGE engineered effective coiled tubing re-entry drilling access these geologically-complex ta well pilot phase of the production enha program is expected to yield 35 BSCF o ~800,000 barrels of oil.

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Norway: Johan Sverdrup

Project details

- Integrated well construction project
- Offshore North Sea
- Contract: 6 years (with option to extend to life of field)
- 50 years estimated field life
- A trilateral partnership between BHGE, the operator, and the rig contractor

Baker Hughes scope

- Baker Hughes' Oilfield Services (OFS) product and services portfolio, including Drilling, Cement, Fluids, Completions, and Wireline
- A dedicated BHGE project management team adding value over pure bundled services

Challenges

- Multiservice contract for well construction and project management
- Flawless HSE
- Deliver "The Perfect Well"
- 50% reduction in well costs by 2018
- Reliability
- Standardization

Resu

- No s to da
- Initia deliv plan
- All w deliv requ
- A 50
- 'Mov 25%
- Worl

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OFE case studies



Fueling Egypt's energy future

With our deep experience in large-bore gas systems and long offsets, we secured a major subsea contract from Petrobel for phase two of the "supergiant" Zohr gas field to provide project management, engineering procurement, fabrication, construction, testing and transportation of a subsea production system. We will also support the installation, commissioning and start-up operations.

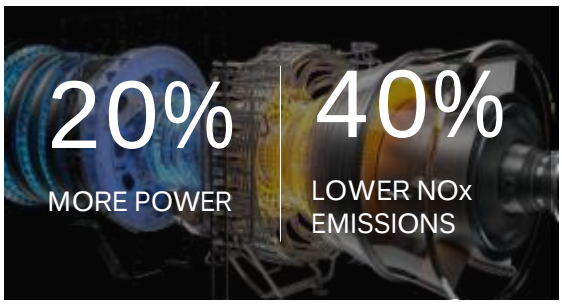


Delivering fullstream solutions in Mozambiqu

We signed two major contra with Eni East Africa: the first, supply subsea production systems and services for the offshore Mozambique development; the second, fo rotating equipment, includin aeroderivative gas turbines power and gas refrigeration the first African-built FLNG fa

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TPS case studies



Launching the LM9000

We introduced the super-efficient LM9000 aeroderivative gas turbine to support large-scale projects. It provides a 20% reduction in the total cost of ownership for LNG operators.



Hydrogen Turbine

Our NovaLT gas turbine product family for 20 MW and below sets new standards in cost-effectiveness while providing higher efficiency and longer operational uptime. We're now extending the NovaLT gas turbine generator technology to also operate 100 percent on hydrogen for the Port Lincoln Project, a green hydrogen power plant facility in South Australia. Building on our previous experience with hydrogen-fueled generation in Italy's Fusina project - in operation since 2008 - we can deliver the same world-leading capabilities and the design features of the NovaLT platform while operating on 100% hydrogen.

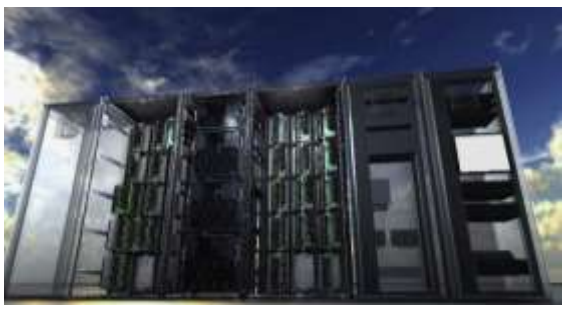


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DS case studies



Increasing reliability and **efficiency for world's largest** nuclear power facility

In 2018, M&C was awarded a multi-unit upgrade project at for Bruce Power in Canada. The project includes our industry-leading control systems, Bently Nevada condition monitoring technology, and our Security ST cybersecurity protection suite.



Expanding our portfolio of clean energy solutions with LUMEN & Flare.IQ

LUMEN technology, a ground- and drone-based advanced methane detection system, helps our customers reduce their impact on the environment and supports our low-carbon goals. In addition, we offer Flare.IQ, an emissions reduction system with hundreds of installations today.

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Baker Hugh