

Breakthrough to Excellence – Our Licence to Operate

Welcome to Day 1 of SPE Offshore Europe 2019, recognized by professionals in the upstream industry's offshore sector as Europe's leading E&P event. This year, the biennial event takes place under the theme, "Breakthrough to Excellence—Our License to Operate." It allows a global network of more than 36,000 industry professionals to connect, source and compare effective solutions.

"SPE Offshore Europe 2019 allows the industry to come together and discuss what really matters," says Michael Borrell, conference chair and Total's senior V.P., North Sea and Russia. "It is important to talk about keeping our costs low, pushing the boundaries of innovation, and focusing on excellence in our operations."

Likewise, Saudi Aramco's Sami Alnuaim, who is the 2019 SPE President, is very enthused about the event's theme, and what organizers hope to accomplish. "I am delighted to see Offshore Europe focusing on the theme of Breakthrough to Excellence—Our License to Operate," says Alnuaim. "This topic is entirely consistent with the conversations I have been having over the past year about the contributions of our industry to a more sustainable world. Showcasing our innovative technologies and motivating people across

the industry to tell our positive stories will be key to improving public perception. I hope everyone will be inspired by the great discussions and technology here, and our contributions to sustainability."

"This is a particularly exciting time for SPE Offshore Europe, as it embraces the industry's drive to a low-carbon future, with significant parts of the conference programme and show floor dedicated to the energy transition," says Simon Marshall, newly appointed exhibition director for SPE Offshore Europe. "As Aberdeen positions itself as the frontrunner for developing technologies and leadership for wider energy sources, Offshore Europe is the ideal platform to effect the collective change needed."

New venue. This year, returning attendees to SPE Offshore Europe 2019 will notice some new scenery. Delivered by Aberdeen City Council, the conference and exhibition are being held in P&J Live, a brand-new, state-of-the-arts events center for Scotland. Just a five-minute drive from the Aberdeen International Airport, P&J Live is in a convenient, easily accessible location for those attending from near or far.

P&J Live boasts world-class conference and exhibition facilities for organiz-

ers and delegates from across the globe (see site plan on page 18). Replacing the Aberdeen Exhibition and Conference Centre (AECC), P&J Live is a £333-million (\$423-million) development. The complex is environmentally friendly, featuring its own energy center. The contemporary venue encompasses 48,000 m² (516,668 ft²) of world-class, multi-purpose event space, including seven conference suites and three exhibition halls.

"We look forward to welcoming Offshore Europe delegates to our new venue, and it is fitting that an event with such a long association with Aberdeen is the first major conference to be hosted at P&J Live," comments Councillor Jenny Laing, Co-Leader of Aberdeen City Council. "Local, regional, national and international visitors will see the positive change in the city that P&J Live is a great symbol of—a world-class venue that will be the envy of cities across the globe."

"Representing the largest single investment in an events complex in Britain, the scale of the achievement by all those involved in the project cannot be overstated," adds Councillor Douglas Lumsden, Co-Leader of Aberdeen City Council. "It is just three years since the first turf was cut. As the largest new entertainment venue in Europe, we have created a world-class facility that the city can be proud of. As Co-Leaders of the Council, we're incredibly proud to be launching the complex and look forward to seeing the arena full, and the conference halls bustling, as the events programme bursts into life in the weeks and months ahead."

Exhibition. Attendees will have the opportunity to engage directly with technical experts from more than 900 suppliers on the exhibition floor (see floor plan on page 19), from international market leaders to new, innovative technology companies. There will be scores of demonstrations and case studies presented from a wide range of firms.

This year, the highly popular, free-to-attend "Decommissioning Zone" returns, and includes decommissioning technology and service providers, as well as a conference theater program, in conjunction with the industry's key associations. Following the offshore sector's recent growth and success, SPE OE 2019 is expanding the area. Now called "The Late Life and Decommissioning Zone," it brings together more than 11,000 highly targeted technical, business and government professionals.

An "ENGenious Zone" is also incorporated into SPE OE 2019, following the

INSIDE THIS ISSUE



3 Subsea Connect: The future of subsea projects

Subsea Connect ties together the entire subsea development process to reduce maintenance costs.



8 Integrated MPD control system improves hydraulics on deepwater wells

World's first completely integrated MPD system improves hydraulics in real time on deepwater wells.



10 Leveraging energy storage to create the world's first low-emissions drilling rig

Advanced lithium-ion storage system creates low-emission, diesel-electric hybrid power plant.



12 Equinor starts up Mariner field on UKCS

Mariner field achieved first oil on 15 August and is projected to eventually produce 70,000 bopd at its peak.



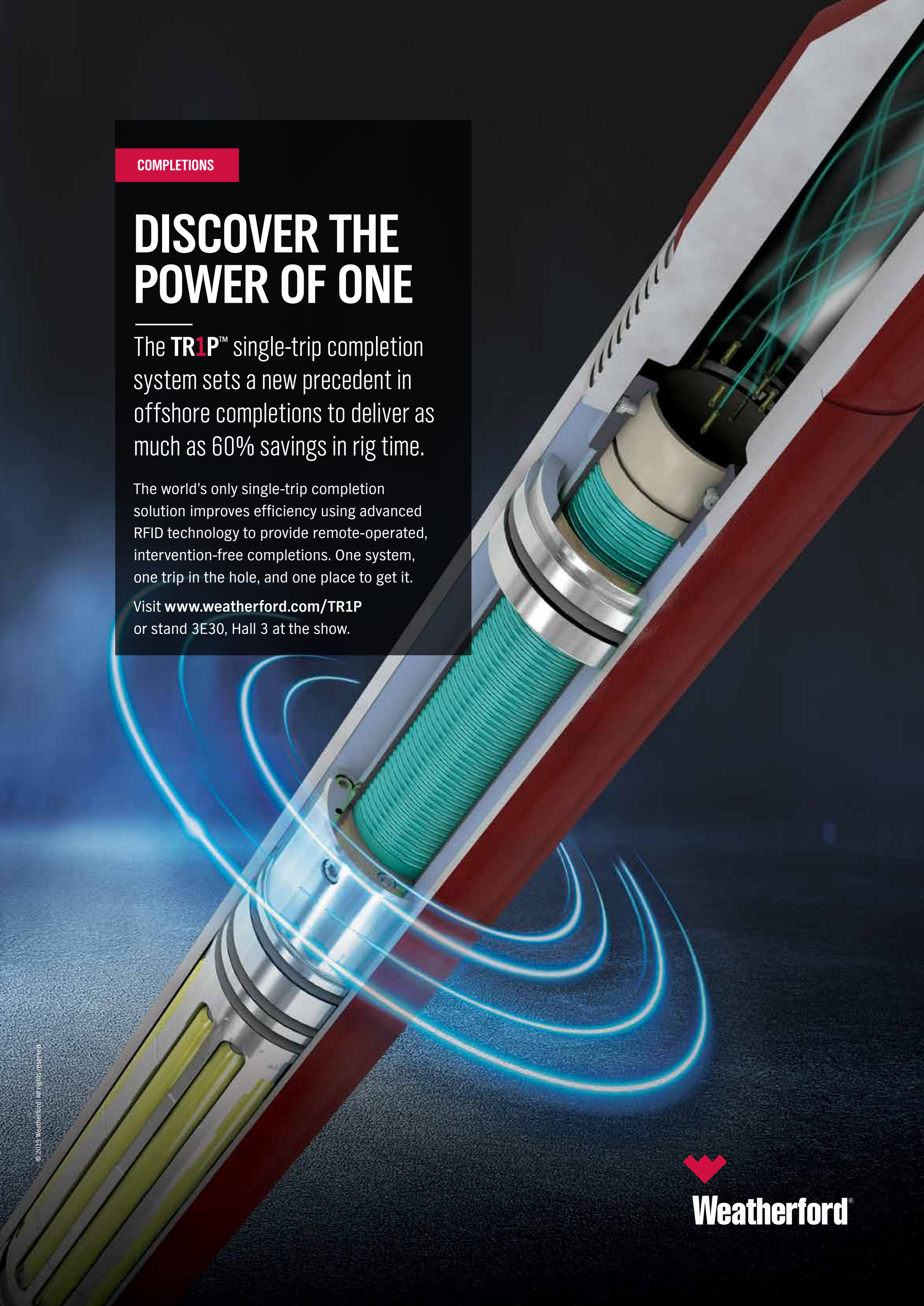
MICHAEL BORRELL



SAMI ALNUAIM



Aberdeen's new P&J Live venue



COMPLETIONS

DISCOVER THE POWER OF ONE

The **TR1P™** single-trip completion system sets a new precedent in offshore completions to deliver as much as 60% savings in rig time.

The world's only single-trip completion solution improves efficiency using advanced RFID technology to provide remote-operated, intervention-free completions. One system, one trip in the hole, and one place to get it.

Visit www.weatherford.com/TR1P
or stand 3E30, Hall 3 at the show.

SCHEDULE OF SESSIONS AND SPECIAL EVENTS

TUESDAY, 3 SEPTEMBER 2019

- 07:30–09:30 **AGCC Business Breakfast**
- Traditional OE launch event focused on new technology
- 10:00–12:30 **Opening Plenary**
- **Speakers:**
 - **Sami Alnuaim**, SPE President, Saudi Aramco
 - **Michael Borrell**, V.P. North Sea and Russia, TOTAL and OE19 Chairman
 - **Patrick Pouyanné**, President & CEO, TOTAL
 - **Wael Sawan**, Upstream Director, Shell
 - **Douglas Pferdehirt**, CEO, TechnipFMC
 - **Karl Johnny Hersvik**, CEO, Aker BP
 - **Christiana Figueres**, Former UNFCCC Executive Secretary, Convenor Mission 2020
 - **Hinda Gharbi**, Executive V.P., Reservoir & Infrastructure, Schlumberger
 - **Moderator: AnjLi Raval**, Senior Energy Correspondent, FT
- 14:30–16:30 **Late Life Operations**
- Late life decisions impact production efficiency and decommissioning liability of offshore facilities.
 - **Session chair:** Alan D'Ambrogio, ABB and IMechE
 - Presentations by ABB, BP, CNOOC, IK, Petrofac and Repsol Sinopec.
- 14:30–16:30 **Artificial Intelligence**
- Discussion of opportunities and challenges of introducing AI to the O&G industry.
 - **Session managers/moderators:** Colette Cohen, OGTC, and Phil Kirk, Chrysaor
 - Presentations by Microsoft EMEA, University of Oxford, Wood Mackenzie and Woodside Energy
- 14:30–16:45 **Finance**
- Discussion of key factors concerning the future of the UK Continental Shelf.
 - **Session managers/moderators:** Jim Lenton, Worley, and Paul Williams, Premier Oil
 - **Keynote address:** Tom Honan, CFO, Worley
 - Presentations by CNOOC, DNB Bank ASA, Kelkas Midstream, and Total E&P UK
- 14:30–16:30 **Transformational Data Analytics**
- Fulling utilizing available data in field development planning and management remains a challenge.
 - **Chairpersons:** Mike Galiunas, BP, and Ian Philips, OGIC
 - Presentations by Emerson, Merkle, Shell and Siemens.
- 14:30–16:30 **Subsea**
- Optimising subsea operations is key to unlocking MER UK.
 - **Chairpersons:** Andrew Brooks, Chevron, and James Woods, Shell
 - Presentations by Allspeeds, Eni, Oil Spill Response Ltd., and Shell UK
- 14:30–16:30 **New Era in Process Safety Management**
- New computing technologies drives improvements in process safety in maturing UKCS fields.
 - **Chairpersons:** Troels Albrechtsen, TOTAL, Robin Simpson, Premier Oil, and Lucy Brown, Schneider Electric
 - Presentations by DNV GL, Energy Institute and SNC Lavalin

Subsea Connect: The future of subsea projects

Subsea Connect is Baker Hughes, a GE company's (BHGE) new approach to connect the entire subsea development process and reduce life-of-field development costs 30%, **FIG. 1**. Through Subsea Connect, BHGE connects the entire subsea development process from the concept phase and supports customers in optimizing the initial CAPEX spend and the entire life-of-field. As a result, BHGE can improve up to 80% of project development costs.

Subsea Connect is an outcome-based approach, consisting of four pillars:

Independent assessment and project delivery process (Project Connect). At concept stage, BHGE starts to work directly with customers to develop targeted project outcomes, and flexible project assessment. This independent planning and risk management—which integrates subsurface, seabed, surface and EPCI capabilities—will radically optimize project execution. It helps customers push the technical limits on process, project schedules and delivery certainty.

Reservoir-to-topsides technology solutions. A cornerstone of Subsea Connect is the Aptara™ family of modular products. These products allow BHGE to work with customers to meet the needs of any project. The Aptara™ family is value-engineered, standardized, configurable components and well designs. Products include the new Aptara™ Lightweight Compact Tree and Aptara™ Compact Block Manifold. This tailored approach allows customers to benefit from shorter lead times and lower costs.

Dynamic partnerships and commercial models. BHGE's partnership model leverages relationships with the most efficient established partners. This allows BHGE to further meet customers' needs and improve project economics. From assessment and project design to SPS-SURF, these partnerships reduce complexity and accelerate speed-to-market across the sub-surface, wells and subsea.

Digital enablement. BHGE is layering critical technologies with next-generation digital solutions to drive greater uptime and enhance productivity. The engageSubsea asset lifecycle management solution is one example. It optimizes planning, execution and connectivity of subsea projects. This digital solution has live, "on the job" offshore activity planning; inventory optimization with remote visibility of equipment and tools; digital access to documentation for enhanced execution; and remote management of asset maintenance. It will drive up to 20% reduction in maintenance costs, and up to 5% reduction in downtime. To learn more about Subsea Connect, visit www.bhge.com/subsea-connect. ●



FIG. 1. Subsea Connect ties together the entire subsea development process. Image: BHGE.

OE 2019
3-6 SEPT 2019
Offshore Europe ABERDEEN, UK

Published by *World Oil and Petroleum Economist* as four daily editions, 3–6 Sept. 2019. If you wish to advertise in this newspaper, or to submit a press release, please contact the editor via email at Kurt.Abraham@WorldOil.com.

Advertisers

ABB Limited	5
AF Global	9
Aker Solutions	20
Dril-Quip	8
Rystad Energy	11
Schlumberger Technology Corporation	5
SPE Offshore Europe	13, 16
Vallourec	7
Weatherford	2

World Oil®

www.WorldOil.com

**PETROLEUM
ECONOMIST**

www.Petroleum-Economist.com

PUBLISHER

Andy McDowell

OFFSHORE EUROPE CONTACTS

Gavin Watson
Jackie Robinson

EDITOR

Kurt Abraham

CONTRIBUTING EDITORS

Ian Lewis
Craig Guthrie
Erikka Askeland

PHOTOGRAPHER

Michal Wachucik

EDITORIAL PRODUCTION MANAGER

Angela Bathe Dietrich

ASST. EDITORIAL PRODUCTION MANAGER

Lindsey Craun Sönmez

ARTIST/ILLUSTRATOR

David Weeks

ADVERTISING PRODUCTION MANAGER

Cheryl Willis

The technology shift in North Sea operations

HARI VAMADEVAN, Sr. V.P. & Regional Manager, UK & West Africa, DNV GL–Oil & Gas

The way that traditional majors, new independents and supply chain companies approach business in the North Sea has shifted dramatically in a short time-frame. Operations are more efficient, partly because most projects now have greater digitalization than was previously available.

Digitalization and Big Data have become much more than buzzwords, as they quickly become enablers for greater productivity and profit. These efforts' effects are beginning to be seen, with more incisive safety measures, fewer people involved with single projects, and greater positivity and transparency translating into new field sanctions and earlier final investment decisions.

Industry confidence figures back up the anecdotal evidence. DNV GL's Industry

Outlook 2019 (IO19) survey takes a snapshot of what leaders and decision-makers are experiencing. This year's results showed that digitalization remains the leading R&D priority, with twice the number of respondents investing in it, compared to the second-ranked priority, subsea technology. Six in ten (60%) respondents said they expected their organization to increase spending during 2019, compared with 54% last year and 39% in 2017.

Lessons have been learned in the industry, and data management is playing a prominent role in a more optimistic outlook returning. Data tools tend to pay for themselves reasonably quickly, by returning greater certainty in operations. Companies can predict more accurately the equipment, manpower and capital they will need for projects at all stages of a lifecycle.

Smarter working, a more cohesive drive toward decarbonization, and decommissioning are also major components of the changing mindset. These not only create operational resilience and excellence, but they impact talent retention and attracting the next-generation workforce. These are people who want to see a positive future in oil and gas, and to see its role clearly in the energy transition.

Upbeat for the upturn. This increase in activity has seen confidence return to operators, but more pivotal is its slow return to the supply chain. Figures from IO19 showed that confidence in the outlook for the UK oil and gas sector quadrupled in two years, from 18% to 71%. Meanwhile, 68% of senior professionals in the sector expected to increase or maintain capital expenditure in 2019.

For these industry leaders and technology innovators, much of the low-hanging fruit has been picked in terms of operational efficiency. Changes are becoming complete redesigns in processes. Offshore operations are going to look increasingly different over the next five years, and this is widely seen as a positive. This appetite for change is why many fields are now operated by private-equity backed ventures, with the number of wells drilled into the dozens, resulting in the highest production levels experienced in more than eight years (UK Oil and Gas Authority).

Consolidation and cost-cutting happened in the industry quickly, and these were blunt efficiency improvements. The more challenging requirements have now started—to do the job smarter, not cheaper. These are not simple actions, but rather approaching problems in completely different ways and taking an in-depth look at processes, technology and preparations for decarbonization.

Several companies have taken the lead in the smarter use of data and realising the economic, technical and logistical benefits that digitalization can bring. DNV GL continues to invest in the Veracity platform, which enables customers to share their data and use tools to provide further insights. For example, with independent verification, Veracity can run analytics instead of just sampling records. It is now possible to write smart algorithms and use these to find anomalies.

Modern businesses typically have the processes, people and awareness to find larger issues, but the technology finds smaller or weaker issues that could be

early warning signs of something much bigger happening in the future. This is the value of digital tools—creating certainty and allowing companies to take decisive action earlier.

Remote operations bring efficiencies closer to home. One way to work smarter is by operating remotely. More than ever, companies are exploring whether their offshore tasks can be completed without being on the platform. There certainly are viable options for gaining line-of-sight to assets and gathering the required information.

Widespread usage of drone technologies to assist with inspection activities is an obvious example. Other practical measures include onshore supervisors guiding offshore colleagues' maintenance activities by video. Automation is also underway, making infrastructure increasingly more reliable, with less parts that need disassembly. This approach is not always easy, given the background of commercial pressures, but it needs to be done.

A complete evolution. The North Sea is known for adapting to change. The diverse range of technology options at the industry's fingertips is beginning to show tangible returns. One key challenge for adopters of new systems and processes is ensuring that people are brought along with key changes. People do adapt quickly, as shown by the widespread use of smartphones. Industry technologies must be intuitive and functional on the operations side. DNV GL has invested in training to support digital change processes and understands that a mind-set change from staff and customers remains one of the biggest obstacles.

Just as mobile technologies have changed dramatically in a short time-frame, offshore operations will evolve. Companies will gain much more from their data and the ability to control things remotely. These changes create real value for the industry and its people, who, with the right tools and training, will use technology as an enabler and be less risk-averse in the future.

To find out more from DNV GL, please visit stand 3B40. ●



HARI VAMADEVAN,
Sr. V.P. & Regional Manager,
UK & West Africa,
DNV GL–Oil & Gas



Earlier this year, DNV GL secured a three-year contract across Dana Petroleum's operated assets on the UKCS as part of its North Sea operations, including the *Western Isles* FPSO. Image: Dana Petroleum.

TECHNIPFMC ACQUIRES DIVE SUPPORT VESSEL FOR NORTH SEA MARKET



The 121-m-long *Deep Discoverer* can cruise at 14 knots and features an 18-person, twin-bell, 300-m diving system. Image: TechnipFMC.

TechnipFMC has added to its international fleet of subsea pipelay, diving and construction ships after purchasing a newbuild diving support vessel, the *Deep Discoverer*. The company signed a deal with VARD shipyard in Norway to purchase the vessel in late 2018. The vessel commenced operations during the first half of 2019.

The high-quality, cost-effective vessel primarily services the North Sea diving construction and inspection, repair and maintenance (IRM) markets. *Deep Discoverer* has DP3 capabilities, as well as an 18-person twin-bell saturation diving system, in-built air diving spread and a 250 Te NOV Hydralift subsea crane.

This acquisition reinforces TechnipFMC's position in the IRM sector, whilst supporting sustainable project economics for clients. Bill Morrice, Vice President of Commercial for UK and Mediterranean at TechnipFMC, said: "This addition to our fleet not only demonstrates our steadfast commitment to diving construction operations in the North Sea, but it also significantly improves our capabilities in the IRM market. Being able to deliver such a high standard of vessel at a competitive rate is further evidence of our company's relentless drive to help our clients succeed." ●



Today's reality. Tomorrow's world

Transforming operations with digital solutions for a sustainable future

Proud sponsors of OETV - visit us in Hall 3, stand 3H50



BREAKTHROUGH, continued from page 1

success of the inaugural event in Aberdeen earlier this year. It highlights innovations in robotics, data analytics, automation and advanced communications. Additionally, The Oil and Gas Technology Centre and social enterprise Elevator are running a start-up zone, featuring some of the biggest up-and-coming companies in the sector.

"We have the energy transition hub supported by ABB, Aker Solutions, BHGE, BP, National Oilwell Varco, the Oil & Gas Technology Centre, Oil & Gas UK, Total, Wood and Worley," notes Marshall. "This has exhibition and theatre space, where these and other companies are showcasing and discussing their activities critical to a sustainable future. The opening plenary and multiple strands of the conference programme are also dedicating time to climate change and the industry's role in the energy transition."

Conference. Attendees can expand their technical knowledge with exceptional insight and best practice at the industry's largest free-to-attend conference (see floor plan on page 19). Produced in association with SPE, attendees can attend breakfast briefings and topical lunches, and more than 50 technical papers will be presented during SPE OE 2019. Speakers representing governmental entities, service companies and E&P majors will discuss important topics affecting Europe's offshore sector.

Attendees can sit in on discussions and analyses associated with a plethora of subjects, ranging from subsea solutions to late-life operations to digitalization and project finance. "Our committee is full of international oil and gas leaders, and they have developed an excellent program," says Borrell.

"Alongside the transition, we're proud to stand alongside a multi-stakeholder vision for the North Sea encapsulated within Energy Vision 2035" added Marshall. "This focuses on net-zero targets and lessened environmental impact for the basin whilst maximising economic recovery."

City of Aberdeen. In addition to the new conference and exhibition venue, local officials have worked to ensure that

Aberdeen hosts the most memorable SPE Offshore Europe, ever. "It is an incredibly exciting period, with many new chapters in Aberdeen's story being written, and today is the most significant part of what is an unprecedented programme of transformation throughout the city," notes Councillor Laing. "We will look back on 2019 as a pivotal year for Aberdeen. There is already a wonderful buzz surrounding the opening of P&J Live, and we're also

looking forward to the opening of Aberdeen Art Gallery, following a restoration and expansion that has created a world-class visitor attraction befitting of the collections we have here in Aberdeen."

Indeed, work has begun on a unique reinvention of Provost Skene's House, and will soon be underway at Union Terrace Gardens. "Marischal Square and the wider regeneration of the area has been embraced by the public, and the refurb-

bished Music Hall is attracting appreciative audiences," continued Laing. "We've also seen the impact the Council's commitment to events, including Nuart and Spectra, is having, and that programme continues to grow and evolve.

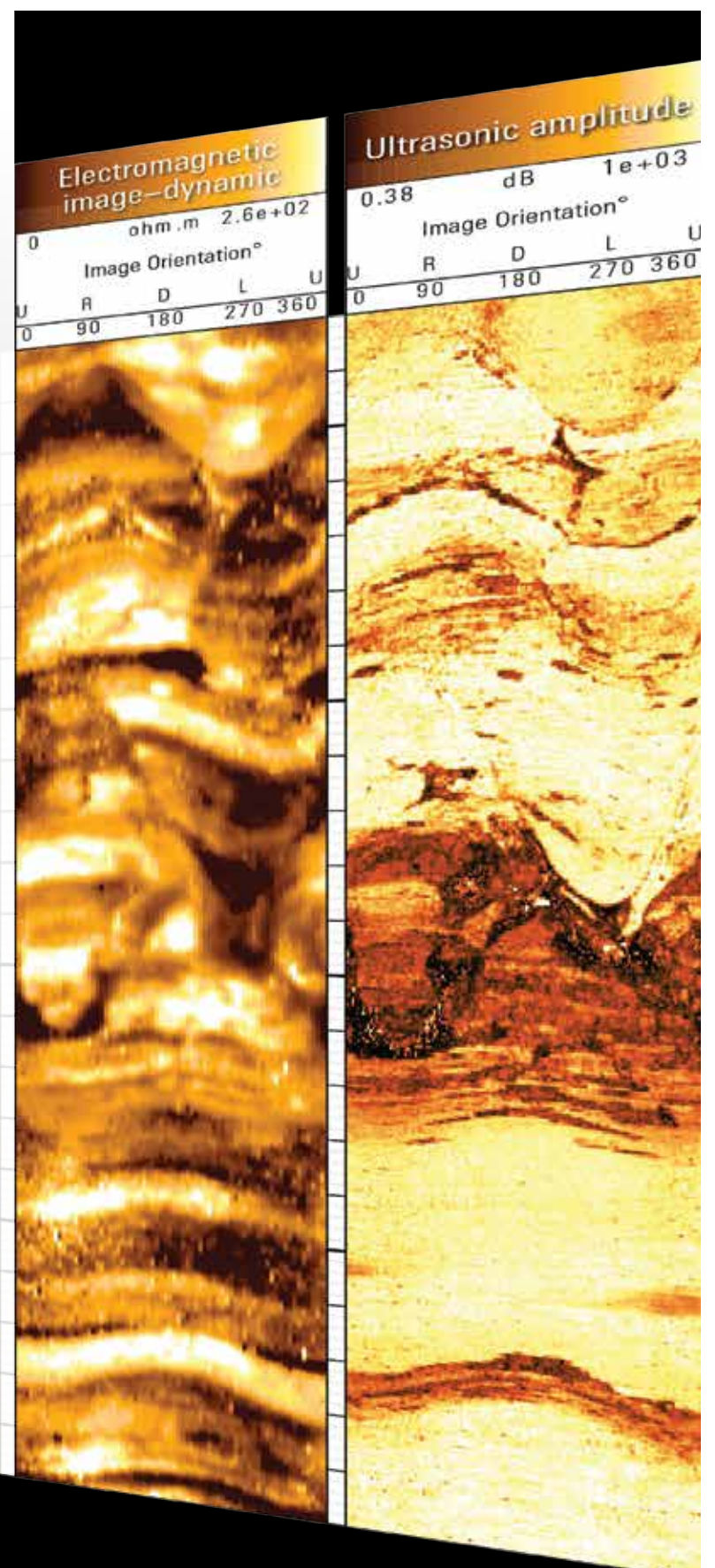
"The built environment is changing, and so, too, is the cultural outlook of the region and its people. We are quite rightly being recognised as a destination city—vibrant and forward-thinking." ●

Industry-First Logging-While-Drilling Dual-Physics Imager for All Oil-Based Muds

Join us in **Booth 3G20** during OE 2019 as we introduce **TerraSphere* high-definition dual-imaging-while-drilling service.**

It equips operators with a powerful tool incorporating both electromagnetic and ultrasonic images in a single collar, revealing subtle subsurface variations that often impact reservoir properties. The real-time HD ultrasonic image and standoff enables drillers to have complete geomechanic analysis while drilling.

Two image physics in one tool now delivers more detailed real-time geological and geomechanical analysis in any oil-based environment while drilling.



Find out more at
slb.com/terrasphere-oe

*Mark of Schlumberger. Copyright © 2019 Schlumberger. All rights reserved. 19-08-575444

Schlumberger



SIMON MARSHALL

Eradicating the costly drawbacks of steel in North Sea operations

MARTIN VAN ONNA, Chief Commercial Officer, Airborne Oil & Gas

Until a decade ago, carbon steel material for pipelines and pipe structures was the chief choice for many global oil and gas pipeline applications. To address the inherent disadvantages of steel, namely corrosion, fatigue and weight, Dutch composite pipe pioneer, Airborne Oil & Gas (AOG), is driving the use of Thermoplastic Composite Pipe (TCP). As a credible and cost-effective alternative, TCP is quickly becoming a market disruptor in West Africa, Asia Pacific and, particularly, the North Sea.

Applying aerospace innovation and insight to the oil and gas industry, the advanced composite pipe features a non-corrosive, solid pipe wall constructed from glass or carbon reinforcement fibres and thermoplastic materials. For risers, flowlines and jumpers, this creates a strong, yet flexible pipe that is 80% lighter than metallic equivalents. It is spoolable and can be installed with smaller, more cost-effective vessels than traditional steel-based pipes.

TCP flowlines are supplied in long, spoolable lengths of up to 3,000 m. This is cost-effective for horizontal lay methods, and has around 40% installed cost savings. In addition, corrosion-averse properties eliminate the supplementary costs of steel, such as pumping corrosion inhibitors, pigging, and inspection and maintenance requirements.

A boost for brownfield developments. Compared to the rest of the

world, the adoption and implementation of game-changing technologies and products are more widely embraced in the mature North Sea basin. The need to safely and economically optimise remaining reserves and extend field life is the main driver.

In July, AOG secured a second award from Anasuria Operating Company to deliver a second, high-flow TCP jumper spool in the central North Sea. The 2-in. ID 345bar-rated gas lift jumper will support operations in Guillemot field, approximately 175 km east of Aberdeen. Two years earlier, the company supplied its first gas lift TCP jumper to the company, along with connectors and ballast equipment.

Over the past three years, the firm has supplied several flexible TCP jumper spools for permanent installation in the UKCS, to enable continued production from maturing fields. In 2016, the world's first TCP in a permanent application was delivered to Chevron North Sea Limited for use on its HPHT Alder project. With the need to inject methanol within the tree and wellhead tie-in spool downstream of the tree, a 12,500-psi flexible TCP well jumper connects the manifold with the tree.

From the outset, the major operator has been a prominent promoter of the company, and its TCP portfolio globally. Both, with a wide range of other oil and gas industry participants, were involved in the development of a dedicated industry standard for TCP in offshore applications, DNVGL-ST-F119.

Made to order matrix. The custom-made material is a viable and credible alternative for flowlines, risers and jumper spools to support hydrocarbon production, water injection, chemical and methanol injection, wellbore access, choke and kill, (de-)commissioning and intervention activities. Depending on the application, the company selects the right thermoplastic matrix and glass or carbon fibre to ensure it has the best fit-for-purpose solution for each application in the challenging offshore and subsea environments. From the North Sea to West Africa and South East Asia, TCP flowline solutions are manufactured up to 7.5 in. ID, 121°C (250°F) and 10-ksi working pressure.

For flowlines in water or methanol injection for instance, the choice for the glass fibre in combination with polyethylene polymer provides the best choice for flexibility, stiffness, minimum bend radius and, hence, length of pipe on reel, and cost. For high-pressure dynamic risers, the combination of carbon fibre with the high-end PVDF polymer is the best, field-proven solution in the context of installability and subsea stability and configuration.

TCP jumper spools outperform rigid steel pipes and conventional unbonded flexible pipes by saving up to 50% on overall investment and procurement costs.

Life extension and production optimisation. Composites are lightweight and offer high levels of strength.

They can be formed into complex shapes and can provide high levels of resistance to fatigue and corrosion. Maintenance needs are relatively low, and they can be installed via reel lay. When compared to steel, TCP has low axial and bending stiffness. Other benefits include reduced vessel hang-off loads, lower installation costs due to lessened weight, lower maintenance requirements and increased flow-rate, due to a smoother internal bore.

In line with DNVGL-ST-F119, AOG has carried out several qualification programmes with major operators to certify its design methodology, production and materials for all its products and offers training on the design, qualification and installation of TCP in ever more demanding applications.

The company has recently adopted a 24/7 shift pattern to handle its thriving order book and has doubled its team of skilled manufacturing operators from 25 to 50. It forecasts a sustained period of productivity gains resulting in a five-fold increase in production capacity and capability, by the end of 2022, at its Dutch plant.

To find out more about TCP products for oil and gas, please visit stand 1AA70. ●



MARTIN VAN ONNA,
Chief Commercial Officer,
Airborne Oil & Gas

Zinc-free monovalent fluids fulfill vital roles

TETRA TECHNOLOGIES

Until very recently, operators have had few options when selecting solids-free brines to complete complex wells. Where fluid density needs to exceed 12.5 lb./gal., the options are further limited to formate or resorting to the use of divalent brines, which might require the use of fluids that contain zinc.

Zinc, however, is restricted to varying degrees in the North Sea, Brazil and the Gulf of Mexico for environmental reasons, being a marine pollutant, and it poses significant risk to personnel and equipment. The only environmentally benign high-density alternative is cesium formate, but its cost is now prohibitively high,

owing to the salt's fast-diminishing supply. Moreover, formate and divalent brines are incompatible with reservoir fluids and geology, and they can hamper production in certain applications.

New formulations. To fulfill the need for a zinc-free, formate-free completion fluid, TETRA scientists began by modifying crystallization-suppression additives and a treatment package originally used in TETRA CS Neptune® divalent brines. Their efforts led to the creation of new propriety additives (FIG. 1), including Galatea and, for higher temperatures, Themisto. They then blended monovalent fluid samples, using the novel additives, along with a new salt system, and evaluated their saturation, thermal stability, compatibility, corrosion, and shale stability on London clay and Heidelberg shale.

The resulting fluids, called TETRA CS Neptune® HDM and TETRA CS Neptune® XHDM (high-density monovalent and extra-high-density monovalent, respectively), achieve densities up to 15.4 lb./gal. with true crystallization temperature (TCT) below 32°F (0°C). Allowing increases in TCT yields even higher densities. Three months of stability testing a 15 lb./gal sample at 350°F showed minimal pH degradation, with corrosion rates of 0.1 mil per year in inhibited samples and 0.5 mil per year in brine, alone.

Applications. In terms of applications, the monovalent fluids are uniquely versatile, as they can be blended for use as completion, drill-in, packer, and workover fluids. They are formulated with renewable components that do not contain zinc, formate, undissolved solids, or priority pollutants. They cost less than alternatives, and they require no special mixing, handling, or storage at the rig site. Because they are zinc-free and have a neutral pH, they pose less risk to personnel and equipment, and do not require a zero-discharge system. In fact, the fluids can be reclaimed for re-use, using standard equipment.

The new additives and salt system enable the blending of effective next-generation, high-density, monovalent fluids that may well prove to be game-changers in the industry, especially in light of the growing complexity of reservoirs and the increasing restrictions on zinc and cesium formate.

Finally, operators have more options regarding compatibility, weight, corrosion, and shale inhibition — the latter often critical in interstitial zones. ●



FIG. 1. TETRA scientists created new propriety additives, which they then used to blend monovalent fluid samples, resulting in the new, zinc-free fluid products. Image: TETRA Technologies.



**Boost
efficiency.
Improve
integrity.**



Discover our digital solutions

Meet our team during SPE Offshore Europe
at booth **1AA58**

Smartengo BEST FIT

A UNIQUE SOLUTION
FOR TRACEABILITY
FIT-UP AND PIPELINE
CONSTRUCTION

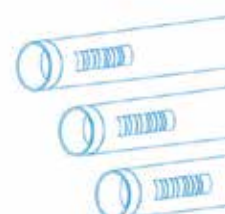
Smartengo INVENTORY

IMPROVE
VISIBILITY
AND EFFICIENCY
OF YARD
OPERATIONS



Smartengo RUNNING EXPERT

OPTIMIZE
RUNNING
OPERATIONS
IMPROVE ASSET
MANAGEMENT



smartengo.vallourec.com

Integrated MPD control system improves hydraulics on deepwater wells

NOV

NOV delivered the world's first completely integrated managed pressure drilling (MPD) control system and real-time hydraulic model on a deepwater drilling



FIG. 1. Cyber-based MPD driller's chair with real-time hydraulics modeling.

rig. While previous MPD installations have included driller-operated systems, these relied on additional human machine interfaces and stand-alone control network components, with limited use of rig data and minimal interface to other critical drilling machines on the drilling rig.

The project was delivered, from concept to operational deployment, within 12 months, and it fulfilled the requirements of both the operator and the drilling contractor. The integrated solution allowed the operator to successfully drill a deepwater exploration well in a challenging environment, where the risks associated with conventional drilling techniques could not have been mitigated.

From the drilling contractor's perspective, all objectives were met through the provision of an integrated system which was robust, cost-effective, and reduced the number of third-party MPD personnel on board. Most significantly, the integration allowed the contractor to re-establish the driller's fundamental responsibility toward well stability and control during MPD operations, by providing full monitoring capability

with key inputs to the MPD operation, via the rig's standard drilling screens, **FIG. 1**. Accomplishing this allowed the supervisors onboard to concentrate on the complex MPD picture, as the well progressed.

This latest project has confirmed NOV's vision that the seamless integration with the existing rig infrastructure, through the installation of the MPD control system as an equal peer on the drilling control network, is key to replacing the currently accepted MPD business model. Embracing this integration will allow access to existing high-speed, robust data networks, as well as optimization of the overall drilling process by including top drive, mud pumps, drawworks, and the MPD equipment in the management of wellbore pressures.

Adopting this strategy enables the drilling contractor to deliver MPD functionality as an integral part of their drilling service, giving them a significant edge in the highly competitive rig market. This is the first step to realizing true MPD integration, with the end goal being a fully driller-operated system, supported by subject matter experts in the drilling contractor organization, located either onshore or offshore. ●

Halliburton awarded well and services contract for Brazil's Libra field

Halliburton recently announced the execution of an integrated services contract with Petrobras for pre-salt development in the Santos basin. The two-year and six-month contract will provide drilling and completion services to drive greater efficiency, by applying pre-salt expertise and integrating multiple product offerings and technologies.

"We are pleased to win this work and to collaborate with Petrobras to provide a tailored application of Halliburton technology," said Anouar Fraija, vice president of Halliburton Brazil. "This contract is a testament to our continuous commitment to safety, superior service

quality, and helping operators maximize their asset value."

Halliburton has an established track record in Brazil's pre-salt fields, which have some of the most complex wells ever drilled, requiring a broad scope of technologies and capabilities to achieve economical and operational success. Halliburton also maintains a technology center in Rio de Janeiro, which serves as a global center of expertise for deepwater innovation and training. The center's capabilities allow Halliburton to translate offshore knowledge into new technologies that reduce uncertainty and increase efficiency and reliability. ●

EMERSON HELPS FIRST CASPIAN SUBSEA PROJECT EXCEED GOALS

Emerson in July completed its \$48-million contract for automation systems and cloud engineering software-as-a-service for the Shah Deniz 2 project in Azerbaijan. The firm is fulfilling an ongoing five-year services contract to help ensure reliable, safe operations. Emerson's support services, predictive reliability software and digital twin solutions will help optimize operations and achieve reliable performance.

The \$28-billion project includes the first subsea development in the Caspian Sea. At plateau, the BP-operated Shah Deniz 2 is expected to produce 16 Bcm of gas per year, incrementally to Shah Deniz 1 production, **FIG. 1**.

Emerson served as the main automation contractor (MAC) for the mega-project, with the company's Project Certainty approach supporting a reduction of global automation engi-

neering complexity, which contributed to production starting more than four months ahead of schedule.

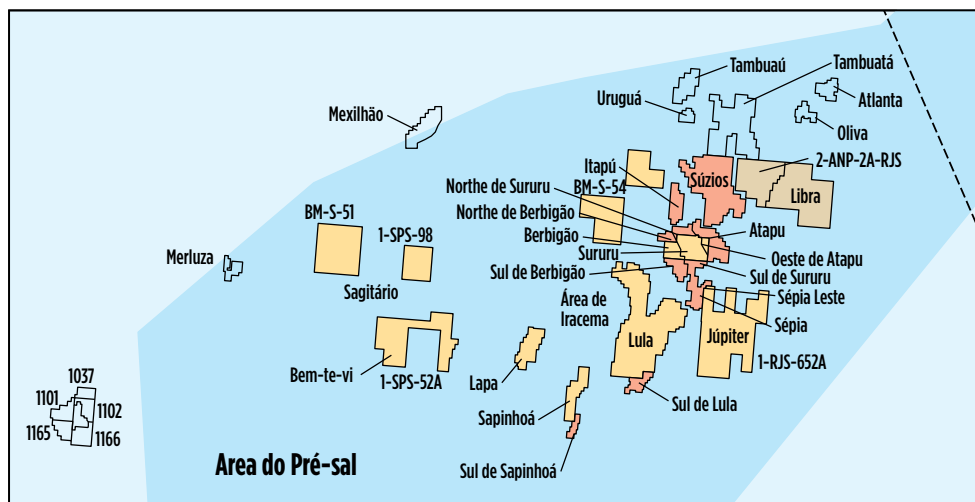
Emerson's advanced predictive reliability software and dynamic simulation software, parts of its digital twin solutions, will help anticipate upcoming reliability concerns before they impact production and simulate the impact of output performance improvements safely, prior to execution.

Emerson's MAC services and cloud engineering services helped incorporate multiple projects, global contractors and suppliers into a unified program, to ensure standardization and maintain the project timeline. Virtualization and implementation of the DeltaV™ distributed control system with Electronic Marshalling helped the project team eliminate design rework by making it easier to fit automation systems into the platform's limited space.

"Emerson's Project Certainty model is designed to help companies ensure that complex projects do not overrun timelines and budgets, and Emerson's MAC services are a core element of that strategy," said Jim Nyquist, group president of systems and solutions for Emerson's Automation Solutions business. "We are proud to have helped complete this project ahead of schedule and excited to provide continued support to promote long-term successful operations." ●



FIG. 1. Shah Deniz Bravo platforms ready for operation in the Caspian Sea, operated by BP offshore Azerbaijan. Image: BP.



Petrobras' Libra field, offshore Brazil.

Why would you drill without MPD?

ANTHONY SPINLER, V.P., MPD, Weatherford

Excitement fills the air, as offshore drilling shows signs of increasing operator tenders. One of the most interesting changes, not fully understood by many, is the increased demand for managed pressure drilling (MPD). Originally starting 50 years ago on land, the technology appeared with the invention of the rotating control device (RCD) for use in air drilling.

Today, numerous offshore operators are requiring MPD-ready rigs in their deepwater drilling tenders, paving the way to a potential future where every floating drilling rig is equipped with MPD equipment. This is a significant change to a technology, whose connection to offshore began approximately in 2003. While MPD has proven itself to be essential in drilling wells with small windows between pore pressure and fracture gradient, this change by operators signifies a broader future for MPD as a performance-enhancing tool. It has significant implications for most all operators, drilling contractors, and OFS's.

First off, why MPD. What is the value of this drilling technology/method that creates such interest by operators? At its most basic form, MPD is a control system that dynamically changes the bottomhole pressure via surface back-pressure; that, along with annular friction pressure and mud weight, improves the robustness of the primary well control barrier.

First, this provides early kick response, improving influx detection, measured in gallons, then enables it to be controlled and subsequently circulated out at higher flowrates and less time than conventional methods. Drilling with optimum lower mud weight at every point in the formation results in improved well construction, which includes greater borehole stability, better hole cleaning, less ballooning, reduced risk of losses or influx, improved tripping, and setting and cementing casing deeper. Globally, some operators have seen significant savings on AFEs and even increased final production rates. In SPE paper 188335, and a presentation by Shell at the IADC/SPE MPD & UBD Operations Conference, the authors documented that they eliminated two casing strings on some wells and reduced drilling days.

Reduced risk of drilling hazards and subsurface uncertainties ultimately avoids complex recovery operations, resulting in less NPT for the overall drilling operation. Most important is the safety aspect of routing annular flow within a closed system, keeping hydrocarbons and hazardous gas away from the rig floor and personnel. To quote a major IOC senior executive, "witness one gas riser event, and there should be no doubt that this [MPD] should be on every rig."

The operators who have maximized the use of MPD certainly know the full financial and safety benefits. Unfortunately, the negative aspect of requiring MPD-ready rigs has forced drilling contractors to purchase expensive MPD equipment. And since market rig rates haven't increased, the contractors are not seeing an ROI, while operators experience considerable benefit at little to no cost. The unfamiliarity of MPD, the rapid change in tender requirements, and the still-difficult rig market conditions have prevented drilling contractors from fully marketing the value that MPD brings to the operator.

New risks. As the paper previously mentioned explains, well planning with MPD before rig selection is an essential part of applying the technology fully. That involves MPD engineers, who understand the formation conditions, equipment configurations, and drilling hazard mitigation. What has impressed me about MPD engineers is that they have the technical ability to work directly with reservoir and drilling engineers to ensure both superior well construction and drilling optimization. Operators and drilling contractors have assumed that MPD-ready means MPD engineering. There have been numerous examples and surprises to all parties, when they discovered that was not the case. Offshore drilling contractors are typically only being trained for basic operation and maintenance of MPD equipment.

Offshore drilling contractors also have

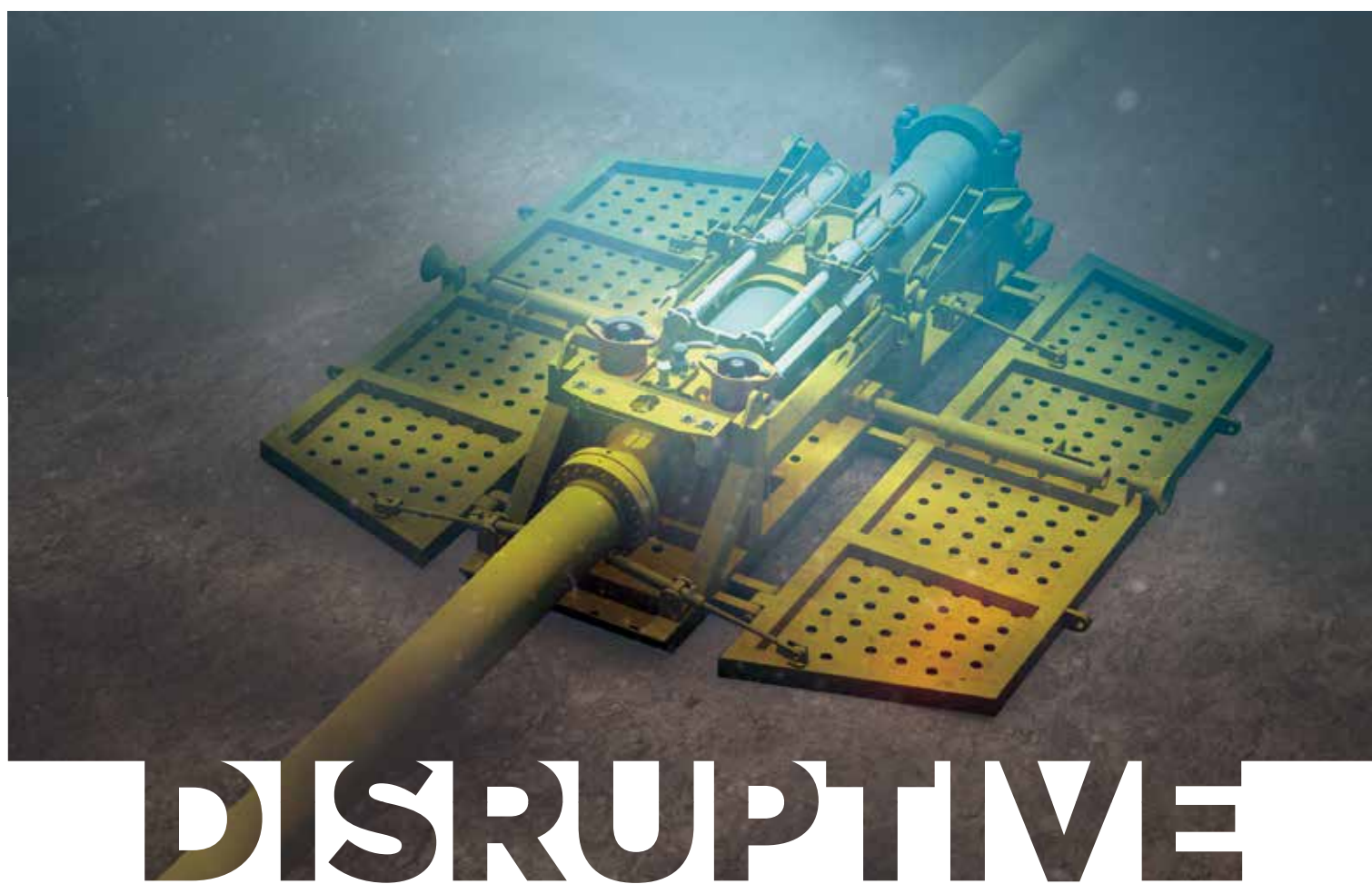
only been exposed to MPD for a few years, and virtually none have been doing any MPD engineering. The average MPD engineer may have eight to nine years of experience, with more senior ones having 20 years of continually planning and executing MPD jobs. Weatherford, the largest MPD service provider, performed over 7,600 MPD jobs on land and offshore since 2014; this averages to ~760 jobs, with any number of wells per MPD engineer/wellsite supervisor. To be fair, how could any new employee be trained with the knowledge from hundreds of MPD jobs and years of experience immediately after the installation of an MPD system on a rig; classroom and simulation training would never accomplish this in just a couple of weeks.

The future belongs to those who can collaborate, market and deliver the value that MPD brings to operators. The

required outcomes include lower costs, safer operations, less risk of well control events, and higher production. MPD can provide these significant safety and performance benefits on many wells. An experienced drilling contractor said to me, the real question is, "why would you not drill with MPD?" Drilling rigs with MPD systems are finding that with the ready access, more wells are being drilled with MPD than would have been before. How fast adoption and utilization of MPD grows offshore is something that we are all about to find out. •



ANTHONY SPINLER,
V.P., MPD, Weatherford



Transformative diverless technology means less risk, time and costs.

Improve safety and achieve a 20% cost reduction for subsea pipeline installation with AFGlobal's diverless technologies. Our work on a project offshore Malaysia uses the Stinger Deployed Diverless Connector (SDDC) that transforms subsea installations of step-out wells and tie-in systems – making them easier and less risky. Connected by engineered Retlock® clamp technology, SDDC removes the need for critical path diver operations. It delivers significant savings compared to conventional diver-installed pipelines in both deepwater and shallow water applications. Specify our SDDC disruptive technology for a cost effective solution with enhanced safety.

afglobalcorp.com/subsea

Agile thinking. Engineering change.

AFGlobal

Leveraging energy storage to create the world's first low-emissions drilling rig

STIG SETTEMSDAL, CTO, Offshore Solutions, Siemens

As oil and gas operators have become increasingly focused on reducing environmental impacts and improving the sustainability of their operations, the concept of leveraging renewable energy sources, such as floating wind farms, to provide clean power to offshore installations has gained traction. But there are still many hurdles to overcome to make this a reality—not the least of which relates to offsetting the intermittency of electricity generation from renewables.

In 2018, Siemens took an important step on the way to solving this problem by supplying an advanced lithium-ion storage solution—called BlueVault—to create the world's first modern drilling rig with a low-emissions, diesel-electric hybrid power plant.

Making energy storage viable in marine applications. Although the concept of using lithium-ion energy stor-

age solutions (ESS) in both all-electric and hybrid power systems is not new, it has not been until recent years that large megawatt-hour (MW-hr) battery solutions have been commercialized for use in marine applications. This is due in large part to numerous technical hurdles that have had to be addressed, including high capital costs, limited battery range, and lifespan, reliability, etc. One critically important factor has also been safety.

Through extensive design, engineering and testing efforts over the years, modern lithium-ion batteries are now a proven technology that can reliably handle substantial charge and discharge power. In addition, weight, volume and price have all been greatly reduced, which is critical in the offshore environment.

Today, the incorporation of energy storage in offshore power plants can generate wide-ranging benefits for operators, allowing them to reduce the run time of

combustion engines and keep generators operating at a level where efficiency is maximized. This is especially relevant in installations that use diesel gen-sets, as operation at loads below the units' rated output can increase the likelihood of wet stacking, which leads to reduced performance and operational life.

By incorporating ESS, gen-sets can be operated at an optimized combustion level, thus maximizing fuel utilization. Any excess power produced from the units can then be stored and used in ways to improve facility performance. For instance, battery energy can be made available for immediate power consumption. In such cases, the batteries support and improve the dynamic operation of gas, diesel or dual-fuel engines with low response capability in critical situations. The batteries also can be used as power back-up in the unlikely event of a blackout.

First low-emissions drilling rig.

Last year, Siemens received an order to supply an ESS to Northern Drilling's *West Mira* offshore drilling rig, which will operate in the North Sea's Nova field, approximately 120 km northwest of Bergen, Norway, FIG. 1. *West Mira* is a sixth-generation, ultra-deepwater semi-submersible designed by Moss Maritime and will be the world's first modern drilling rig to operate a low-emission hybrid (diesel-electric) power plant using lithium-ion energy storage.

The solution consists of four converter-battery systems (total 6MW). The bat-

teries will be charged from the rig's diesel-electric generators and used to supply power during peak load times. Also, they will serve as back-up to prevent blackout situations and provide power to the thrusters in the unlikely event of loss of all running machinery.

The installation of BlueVault on *West Mira* will result in an estimated 42% reduction in the run time of on-platform diesel engines, reducing CO₂ emissions 15% and NO_x emissions 12%, which is equivalent to annual emissions from approximately 10,000 automobiles, FIG. 2.

The ESS solution that was installed on *West Mira* has been applied successfully in more than 60 marine vessels worldwide. Its application on an offshore platform, however, is an important achievement that will enable the development of a low-emissions platform. Ultimately, the solution and its application will serve as a proof of concept for harnessing power from clean, but intermittent renewables in the offshore oil and gas environment.

Additional details will be presented at SPE paper 195777, "Applying energy storage solutions (ESS) in offshore oil and gas to reduce emissions and costs," 11:30 am, Tuesday, 3 September. ●



STIG SETTEMSDAL,
CTO, Offshore Solutions,
Siemens



FIG. 1. *West Mira* will operate on a low-emission plant powered by lithium-ion energy storage. Photo copyright: Neil Robertson

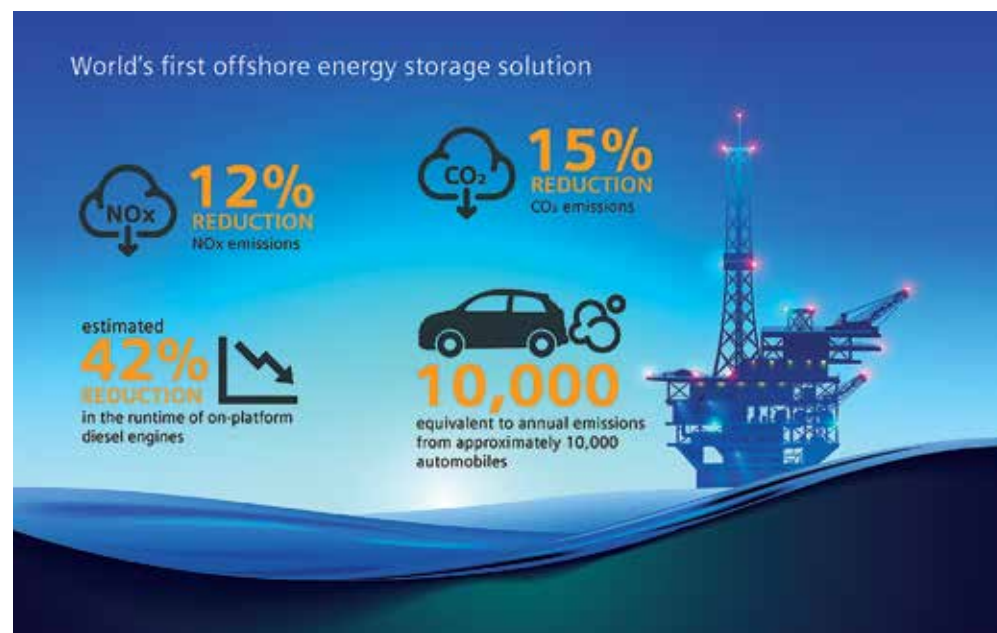


FIG. 2. BlueVault will reduce on-platform diesel engine run time 42%, reducing CO₂ emissions 15%.

BP DECK OPERATIONS CONTRACT A FIRST FOR SPARROWS GROUP ON UKCS

Sparrows Group recently announced the award of its first contract to deliver deck operations services on the UK Continental Shelf (UKCS) from BP. The contract builds on the Aberdeen-headquartered company's existing long-term relationship with the operator to become a single point of contact for all lifting and handling operations across its Andrew, Clair Ridge, ETAP and Glen Lyon platforms in the region.

New work scope. Under an existing agreement, which was renewed in 2015, Sparrows has been providing crane maintenance and operations services to BP in the North Sea for over 45 years. This new scope of work will see Sparrows' deck crew fulfill multiple roles, including load handler and banksman/slinger to support lifting operations and carry out bulk handling and management of all cargo on

the assets. In addition, the crew will undertake helideck and emergency response functions, as necessary.

Sparrows CEO Stewart Mitchell said, "We have successfully delivered deck operations for over 15 years on FPSOs and platforms in African waters, including for BP Angola on the Plutonio and PSVM. This award demonstrates the strong relationship we have with BP globally, and our previous experience will be key in executing these first contracts on the UKCS.

"Having worked with BP for a number of years, providing crane maintenance and operations, we have an unrivaled knowledge of the assets, enabling us to provide a consistency of service across both contract scopes. Extending our services to deck operations is a natural progression for us and gives our clients confidence that all safety critical lifting and handling operations will be managed by one specialist contractor." ●

Worley and AVEVA to deliver cloud-based resource management solution

AVEVA and WORLEY

AVEVA recently announced that Worley has selected AVEVA's Enterprise Resource Management solution as its preferred materials management platform. The partnership combines Worley's Engineering, Procurement and Construction (EPC) knowledge with AVEVA's industrial software expertise to deliver the first cloud-based Enterprise Resource Management solution optimized for the EPC market.

Reducing costs. Like many businesses, today's EPCs must reduce project costs while keeping pace with changing IT environments. However, since EPC projects operate as mini-enterprises, on-premises configuration and hosting of enterprise projects within private networks is not only costly, but restrictive and unsustainable in an industry undergoing consolidation. To keep global EPCs competitive, the move from on-premises infrastructure to cloud-based enterprise resource management is necessary.

Worley sought to help its customers find a way to streamline materials management, to deliver on these challenges, while also creating process improvements, increased efficiency, ease-of-use and the ability to deliver in-house training. After reviewing AVEVA's Enterprise Resource Management solution—historically used in marine settings—Worley and AVEVA committed to developing the AVEVA solu-

tion to become the industry's first cloud-based enterprise resource management platform, purpose-built for EPCs.

"The EPC market is undergoing change, and our customers are looking to us to help them find solutions in this new world," said Worley CEO Andrew Wood. "The advances in technology and digital disruption have provided us with an opportunity to rethink our approach to materials management. We needed to deliver an efficient, cloud-based solution customized for the nuances of our market. With AVEVA, we saw a commitment to developing this solution together, to create something best-in-class for engineering. We believe the AVEVA Enterprise Resource Management solution marks a step forward for productivity, efficiency and effectiveness that will drive the EPC industry forward."

The cloud-enabled solution is the first of its kind and will be fully optimized for the EPC market. By embedding Worley's subject matter expertise in EPC supply chain management, major updates to the AVEVA Enterprise Resource Management solution for EPCs include:

- Project-specific functionality: Enabling EPCs to view and work on projects in AVEVA Enterprise Resource Management as standalone entities.
- Updated catalogs and specifications

module: Migration of Worley's legacy corporate catalog and specifications to create a robust, easy-to-use EPC model.

- Training solution: Allowing EPCs to streamline internal training on the new solution.

The final phase. Last April, Worley and AVEVA kicked off the final of four phases to develop the AVEVA Enterprise Resource Management solution for EPCs. Phase one included design, while phase two incorporated the solution build, moving onto phase three integrations and catalog readiness, and now into phase four—the project goes live and Worley's legacy solution is decommissioned.

AVEVA Enterprise Resource Management also reduced training time 23% across engineering, procurement and project controls. Participants noted the solution was easy to use, providing quality training materials and the right functionality for EPC projects.

"The construct of the co-managed project team exceeded all expectations," said AVEVA CEO Craig Hayman. "We set up stringent delivery benchmarks and executed the project in phases to ensure alignment between the teams remained in place. A transparent and open working relationship, with a keen focus on the success of the initiative, played a crucial

role in adjusting to all project challenges. This solution is something we are proud to have delivered together."

The official project roll-out for Worley on the AVEVA Enterprise Resource Management solution for EPCs is just beginning. Worley will use AVEVA Enterprise Resource Management and AVEVA Everything3D innovative plant project execution software in tandem. The two companies will work to continually mature enterprise resource management for the EPC market. •



Worley CEO Andrew Wood (left), and AVEVA CEO Craig Hayman (right) announced a partnership to build upon AVEVA Enterprise Resource Management software and deliver the first cloud-based solution optimized for the EPC market.

REGIONAL SERVICE ANALYTICS

A Complete Review

Regional Service Analytics offers subscribers a complete regional review of the local oilfield service markets, including historical data and bottom-up forecasts – ideal for oilfield service suppliers, operators and investors.

- Insights into each region, including historic and future development of oil & gas exploration activity, production and investments
- Segment-by-segment review, split into 6 macro segments, 11+ core segments, and further into 50+ detailed categories
- Field-by-field status review, including complete overview of all installations, recent discoveries, new project sanctioning, recently performed large modifications, and upcoming modification projects

Find us at Offshore Europe 2019 booth 1G43

www.rystadenergy.com



RYSTAD ENERGY



Equinor starts up Mariner field on UKCS

EQUINOR AND OIL & GAS UK

Equinor and partners on 15 August announced that they achieved first oil from Mariner field (FIG. 1) in the UK North Sea. The field is expected to produce more than 300 MMbbl of oil over the next 30 years. Mariner lies on the East Shetland Platform of the UK North Sea, approximately 95 mi or 150 km east of Shetland and 320 km northeast of Aberdeen.

“The start-up of Mariner, the first Equinor-operated oil field on the UKCS, establishes our foothold in the UK and reinforces our commitment to be a long-term energy partner,” said Hedda Felin, senior V.P. for UK and Ireland Offshore at Equinor. Equinor operates Mariner

with 65.11% equity. Partners include JX Nippon (20%), Siccar Point (8.89%) and ONE-Dyas (6%). “First oil from Mariner represents a significant achievement for Equinor and its pioneering development of the field, helping the company to become a major player in the UK sector of the North Sea with a long-lasting, positive impact on the region,” said Mike Tholen, Upstream Policy Director at Oil & Gas UK (OGUK).

Mariner’s reservoirs hold up to 3 Bbbl of oil-in-place, a 50% increase on what was originally assumed. The estimated recovery rate already has been increased 20%. Mariner is expected to produce annual average plateau rates of around 55,000 bopd and up

to 70,000 bopd at peak production.

“By gathering and interpreting new seismic data, we have improved our understanding of the reservoirs,” noted Anders Opedal, executive V.P. for Technology, Projects and Drilling at Equinor. “This has resulted in fewer and better-placed wells, and increased resources, since the project was sanctioned in 2012. With the significant volumes in place, we see clear potential to further increase the oil recovery from Mariner field and will proactively seek opportunities to do so through the application of new technology, additional drilling and future tie-back opportunities.”

Mariner is one of the largest industrial

projects in the UK, in recent years. A gross investment of more than \$7.7 billion, the development will support more than 700 long-term jobs and generate significant revenue in the supply chain for decades to come. Contracts worth more than \$1.3 billion have been awarded to UK suppliers since the project started. Mariner’s field development concept has included a production, drilling and quarters (PDQ) platform based on a steel jacket, with oil being exported to a floating storage unit (FSU) and then to shore via tankers. Drilling is being carried out from the PDQ drilling rig. Around 100 wells will be drilled over the first 12 to 14 years.

“With the start-up of Mariner, we have delivered one of the most complex developments in the North Sea and Equinor’s portfolio,” added Opedal. “We will continue to apply digital solutions and new technology to deliver safe, efficient operations and optimize production.” Digital solutions include automated drilling, digital twin, field worker tools, and digitized logistics to support operational and field maintenance planning.

“As the largest offshore development in the UK for a decade, Mariner has utilised pioneering technology to bring onstream a field first discovered nearly 40 years ago,” noted Tholen. “In doing so, it has provided thousands of highly skilled jobs across the country during its development and will support many more in the years to come.”

In the UK, Equinor has established a broad energy portfolio including oil, gas and offshore wind, with Mariner as the foundation of its upstream operations. “Many have played a part in bringing Mariner onstream safely, including our partners, contractors and suppliers, and we are grateful for their important contributions,” Felin said. Equinor is one of the most active explorers in the UK, with five exploration wells in 2019.

“Mariner field will contribute toward energy security for the next 30 years,” added OGUK’s Tholen. “With up to 3 Bbbl of oil-in-place, it contributes to industry’s shared ambition, Vision 2035, which looks to meet as much of the UK’s oil and gas needs from home-produced resources, as possible.” ●



FIG. 1. Equinor’s Mariner field started up last month and eventually will produce 70,000 bopd at its peak. Image: Equinor.

CANNSEAL ENTERS U.S. MARKET THROUGH EXCLUSIVE PARTNERSHIP

CannSeal, the specialist firm in annular isolation technology, has entered the U.S. market through an exclusive agreement with Renegade Services. The new partnership will see Renegade Services market and operate CannSeal’s technology across the U.S. and Gulf of Mexico. This technology is now available to operators looking



CannSeal’s proprietary downhole delivery tool.

to extend the life of a mature well or re-establish well integrity. Ahead of the launch, the Renegade team underwent a rigorous training programme in Norway. With support from CannSeal, Renegade will install, deploy and service the proprietary tool.

The technology works by injecting a tailored epoxy sealant into the annulus at a pre-defined location, using the patented delivery tool. It is designed to target two key industry challenges; well integrity and annular zonal isolation. The fully adaptable solution re-establishes well barriers in the hardest-to-reach areas of challenging wells, with minimal interruption to production. In addition to rigorous and systematic testing, the CannSeal tool boasts a track record of more than 50 runs, both onshore and offshore.

CannSeal CEO Bengt Gunnarsson commented: “It is a proud moment for us, as we enter the U.S. market for the first time. As the largest independent provider of cased-hole electric wireline services in the U.S., Renegade Services was the natural fit to bring our technology to the U.S. Similar to us, Renegade Services is a team of engineers, who are guided by an entrepreneurial spirit to champion new problem-solving technologies.

“The U.S. is a strategic market for us, particularly for our IntegritySeal product. This is due to the huge amount of wells that requires the cemented annulus to be sealed. In producing wells, our technology can relieve issues associated with sustained casing pressure or plug & abandonment.”

The news follows a year of growth for the Norwegian oil technology company, with new contracts awarded by clients including NAM, BP, Shell and Equinor. CannSeal is showcasing its technology at Offshore Europe as part of the OGTC stand. ●

Ardent's Martin sees opportunities in decommissioning

Stuart Martin is a 35-year veteran of the upstream sector. With Ardent, his career has now come full circle from commissioning assets in the early 1980s to decommissioning the same assets now. A graduate of Napier University in Business Studies and holder of a post-graduate diploma in Project Management from The University of Manchester Institute of Science and Technology (UMIST), Martin is the Sales and Marketing Director for Ardent.

Recently, in a Q-and-A session, he offered his views on a wide range of decommissioning issues.

OE: Global analysts predict a US\$32-billion decommissioning bill over the next four years. How is this as an opportunity for the industry and its workforce?

Martin: This is a dual opportunity on a macro and micro level. Firstly, to replace the opportunities that are missing, in terms of greenfield developments in the UK. And secondly, to extend the maximum economic recovery (MER) and provide work for existing stakeholders in an aging basin.

At a macro-level, the new technologies coming out from Scottish companies are making a real difference and will create new markets globally for exportable technologies and skills. Some emerging decommissioning markets are struggling to find the right balance between goal-setting and prescriptive formats for their regulations. Whilst the Gulf of Mexico is well ahead of us in track record, the UK is going to be in a great position to take advantage.

OE: As we move from late-life operations into decommissioning, is it wrong to see this as the "sunset" era for oil and gas and its career prospects?

Martin: I'm at the other end of the scale. I joined the industry in '83 and commissioned a lot of the assets that we are now decommissioning. Even then, people were talking about the end of "Big Oil." If you look at global project databases, there are plenty of big elephant fields being found and discovered. We are a long way from the industry's "Golden Years." In the long term, various decommissioning plans will provide revenue for decades. I am not nearly as pessimistic as others.

OE: Decommissioning came out as the top interest in a recent industry survey. Why would that be?

Martin: That surprised me a little bit. That insight is interesting, because for many people, decom is probably the least stimulating part of the industry. After all, it's a zero-sum game. My hunch is that this finding covers several contributing factors, such as long-term employment opportunities.

Rather than take a sceptical, downbeat view, I believe we will see a step change. This should be measured with alignment globally on regulation and cross-border action on decommissioning.

OE: How will decommissioning change in the next five years, and what are Ardent's ambitions?

Martin: If we don't change the existing mindset, and the way that we have

executed projects in the UK and Europe, we are going to get similar outcomes and that typically is over cost and schedule, with some safety incidents thrown in for good measure.

For Ardent and our decom consortium partners, Worley Parsons and Lloyd's Register, we have the single aspiration of being the go-to or prime engineering, procurement, removal, dismantling (EPRD) contracting entity for all operators; a one-stop-shop for decommissioning.

I hope that within five years, operators will realise that they may not be best-placed to handle the execution and consider giving responsibility to specialists. I also hope we will have some best practices established for different assets, regional conditions, etc, and that we will share norms and benchmarking on tools.

OE: Within decommissioning, how can 35% cost reductions be achieved?

Martin: We all recognise why it is there, but the problem is 35% of what? We don't know the starting point. This is because the custodians of decommissioning costs are the regulators and the operators, and this is not shared with the supply chain or other stakeholders—it is a capricious beast or concept. As long as they hold on to the data and don't share it, we don't really know if we are achieving 35% reduction.

If the regulators were to insist on a standardised close-out report for each project that included meaningful metrics and costs, it could be anonymised and sent around to the industry, saying, "Here is what best practice looks like. These are the

savings that we made." This would provide a real stimulus to the supply chain. ●



STUART MARTIN, Ardent Marine Decommissioning

TUESDAY

TODAY'S CONFERENCE HIGHLIGHTS

OPENING PLENARY, 10AM-12:30PM, CONFERENCE ROOM 2A +2B

SAMI ALNUAIM, SPE President

MICHAEL BORRELL, Senior Vice President, North Sea and Russia, TOTAL and OE19 Chairman

PATRICK POUYANNÉ, President & CEO, TOTAL

DOUGLAS PFERDEHIRT, CEO, TechnipFMC

HINDA GHARBI, Executive Vice President Reservoir & Infrastructure, Schlumberger

KARL JOHNNY HERSVIK, CEO, AkerBP

CHRISTIANA FIGUERES, Former UNFCCC Executive Secretary, Convenor Mission 2020

WAEEL SAWAN, Upstream Director, Shell

FINANCE: NEW START UPS - PROJECT FINANCE - NEW MARKET ENTRANTS, 14:30-16:30, CONFERENCE ROOM 2A

JIM LENTON, MD Integrated Solutions, Worley

PAUL WILLIAMS, UK Business Manager, Premier Oil

GUY APPLETON, Finance & Growth Director, Kellas Midstream

KAREN BOESEN, Finance Director of Total E&P UK

ESPEN KVILEKVAL, Global Head of Oil & Gas, DNB Bank ASA

SCOTT MCGINIGAL, VP Business Services, CNOOC

ARTIFICIAL INTELLIGENCE, 14:30-16:30, CONFERENCE ROOM 2B

COLETTE COHEN, CEO, OGTC

PHIL KIRK, CEO, Chyrsaor

ALESSIO BAGNARESI, AI Sales Lead in the Intelligent Cloud team, Microsoft EMEA

ALISON BARNES, Head of Robotics, Woodside Energy

MARTIN KELLY, Vice President, Head of Corporate Analysis, Wood Mackenzie

DR MARIAROSARIA TADDEO, Research Fellow Deputy Director | Digital Ethics Lab, Oxford Internet Institute, University of Oxford

WEDNESDAY

TOMORROW'S CONFERENCE HIGHLIGHTS

DECOMMISSIONING - NOW'S THE TIME, 10AM-12PM, CONFERENCE ROOM 2B

SESSION MANAGERS:

ANDY SAMUEL, Chief Executive, OGA and **GEIR TUFT**, Chief Executive Officer, Ineos

Moderator: **ANDY SAMUEL**, Chief Executive, OGA

SPEAKERS:

JOHN HAND, Technology Programme Manager, ConocoPhillips

CAROLINE LAWFORD, Decommissioning Project Lead, CNRI

PAMELA LOMORO, Decommissioning Project Manager, OGTC

MARTHA VAZQUES, Principal, BCG

JON CLARK, EMEA Oil & Gas Transactions Leader, EY

DIGITALISATION, 14:30-16:30, CONFERENCE ROOM 2B

ZVONIMIR DJERFI, President Global Sales, Baker Hughes, a GE company

RAMI ALIEH, GM Digitalisation Upstream, Shell

ROB KELLY, Head of Upstream Digital, BP

JOHN LERVIK, Chief Executive Officer, Cognite

ROHIT SINGH, Digital Programme Manager, Equinor

SECURING GENERATION 2035, 14:30-16:30, CONFERENCE ROOM 2A

DEIRDRE MICHIE OBE, CEO, Oil & Gas UK

HEDDA FELIN, Senior Vice President, Equinor

RYAN FERNANDO, Apprentice of the Year, Oil & Gas UK Awards

PAUL DE LEEUW, Director Oil & Gas Institute, Robert Gordon University

JOHN MACDONALD, CEO, OPITO

SUE MACDONALD, Executive President, People & Organisation, Wood

GARETH MACQUEEN, Graduate of the Year, Oil & Gas UK Awards

VICTORIA CAMERON, Business Coordination Manager, Kellas Midstream

DNV GL to call for offshore verification to improve contribution to safety

DNV GL

Offshore verification needs to move with the times and improve its contribution to safety, according to global risk management company, DNV GL. In a paper to be presented at the SPE Offshore Europe 2019 conference this afternoon, DNV GL will reveal, for the first time, details of its project to develop the next generation of verification to manage risks relating to major accident hazards.



DNV GL will present a paper Tuesday afternoon as part of a larger effort to introduce a new verification approach. Image: DNV GL.

The organization is piloting a new verification approach that utilizes digital technologies, particularly data mining techniques and smart software, that were not available 30 years ago when verification was first introduced to the UK. DNV GL believes that this approach will improve the benefits contributed by the independent verifiers to offshore safety, by taking a more focused approach toward assessing management of risks without increasing cost to the duty holder and while more effectively meeting the intent of the current legislation.

Several North Sea operators have been working closely with DNV GL to review how the verifier can improve its contribution to the management of offshore safety. Jack Downie, Head of Development and Innovation, UK Verification Services, at DNV GL, and author of the paper said, “Through discussion with many duty holders, we know that there is a common understanding that the current verification system has not evolved in line with industry’s new reality.

An update is needed. “Much has changed in the last 30 years; our collec-

tive understanding of major accident hazards and the contribution made by safety, and environmental critical plant and equipment, has improved. Safe systems of work are more advanced; computerized maintenance management systems have developed; and offshore communication and technology are unrecognizable, compared to the 1990s.

“Our paper at SPE Offshore Europe will present a critical review of the verifier role and whether it still meets the original intent of the process that was created by Lord Cullen through the Safety Case Regulations (1996).” The paper will give examples of deficiencies in the current verification system and launch DNV GL’s proposed, more efficient and encompassing service, which follows the principles of process safety and will ensure that the verifier is looking at the right risks, at the right time.

The aim of this new approach is to enhance the ability of the verifier, and therefore the duty holder, to visualize signals of deterioration in performance of their hazard management. DNV GL will hold workshops with duty holders over the next few months and begin pilot assessments, early in 2020, where techni-

cal results will be compared directly with traditional methods. The offshore workforce will be engaged through offshore meetings and requests for feedback.

The DNV GL paper, “Next Generation Verification of Offshore Assets,” will be presented this afternoon at 15:30 hrs in P&J Live. The overall session, “01T: A New Era in Process Safety Management” (14:30-16:30), will illustrate how new computing technologies applied to maturing fields on the UKCS drive improvements in process safety. Specialist numerical analysis, or having a digital twin of the offshore facility, is now an efficient alternative to conventional design approaches as a basis for risk assessment processes.

Attendees will learn about the pooling of billions of hours of data on pressure safety valves, to feed into risk-based inspection schemes; the use of digital twins in updating of procedures; and, at the same time, incorporating human factors reviews. There also will be reviews of the progress of safety application and technology over the last 30 years, giving learnings on how the industry manages major accident hazards, hydrocarbon leaks and decommissioning activities. ●

Trendsetter and IWS forge ahead with JV

TRENDSETTER ENGINEERING

Trendsetter Engineering, Inc. and Intelligent Wellhead Systems, Inc. (IWS), recently announced the establishment of a joint venture to introduce new technology and services, aimed at improving the safety and efficiency of offshore drilling, completion, intervention and abandonment operations. The JV, InVision Offshore, Inc. (“IO”), **FIG. 1**, will be based in Houston, Texas, USA.

The JV leverages IWS’s field proven InVision™ technology to revolutionize the way that riser and riser-less operations are conducted offshore. Drawing on the subsea expertise and service infrastructure of Trendsetter, the JV will be positioned to transform the way that offshore operations are conducted through the introduction of real-time intelligence. InVision™ can be configured for installation at any point between the rig floor and the mudline, to provide the exact

position and condition of all tooling run in the well.

“In searching for a partner in the offshore market, the selection of Trendsetter was obvious, based on their reputation for quality deliverables and innovative approaches to complex subsea operations,” said Intelligent Wellhead Systems CEO Mitch Carlson. “Our team is excited about the joining of these two visionary companies to form InVision Offshore, as the portal to launch new game-changing technologies currently under development for the offshore market.”

“Building upon our recent success in intervention services, the value of a subsea deployable InVision™ system was obvious to our team,” said David Older, EVP of Corporate Development at Trendsetter. “With over 3,000 successful surface runs through the InVision™ system, Trendsetter views this technology as the cornerstone to developing a comprehensive end-to-end best-practice solution for intervention operations.”

Trendsetter Engineering, Inc., is a privately owned oil and gas service company, based in Houston, Texas, which provides specialized subsea hardware and offshore service solutions globally, from exploration drilling through abandonment. Intelligent Wellhead Systems, Inc. is a privately owned oil and gas technology/service company, based in Edmonton, Alberta. It provides proprietary and unique surface pressure control systems for various markets globally. These markets include snubbing, plug & perf completions, critical well intervention and fishing operations. ●



FIG. 1. Trendsetter Engineering, Inc., and Intelligent Wellhead Systems, Inc., have formed the InVision Offshore, Inc., JV to improve the safety and efficiency of offshore drilling, completion, intervention and abandonment operations. Image: Trendsetter Engineering, Inc.

OGUK FLAGSHIP REPORT LAUNCH UNDERWAY WEDNESDAY

As this initial issue of the OE Show Daily hits the stands around P&J Live, leading voices from across the UK’s offshore oil and gas sector are preparing to join panels of simultaneous breakfast briefing events on Wednesday in Aberdeen and London, to discuss the findings of Oil & Gas UK’s (OGUK’s) flagship *Economic Report 2019*.

Kellas Midstream Managing Director Andy Hessel, Opex Group COO of Technology Chris Ayres, Premier Oil’s North Sea/Exploration Director Robin Allan and Wood’s Sr. V.P. for digital and technology-operations, Fiona McKie, are joining OGUK Chief Executive Deirdre Michie and report author, OGUK Market Intelligence Manager Ross Dornan, on the panel for the Aberdeen Breakfast Briefing event. The briefing during Day 2 of Offshore Europe is being sponsored by Deloitte.

At the London event, sponsored by White & Case LLP, OGUK Upstream Policy Director Mike Tholen is being joined by Lead Business Advisor Sophie Guy-Pearson, plus Neptune Energy’s V.P., Operations, Bruce Webb, and Petrofac’s Head of Strategy, Jonathan Carpenter.

OGUK’s *Economic Report 2019* provides a comprehensive insight into how the UK oil and gas industry is performing and positioning itself for a successful future. It reviews energy policy within a changing political, economic and social environment.

Advance thoughts. Commenting in advance, OGUK Stakeholder And Communications Director Gareth Wynn said, “The UK offshore oil and

gas industry is a vital national asset for the UK, providing hundreds of thousands of skilled jobs, contributing billions to the economy and providing the nation with secure and affordable energy. It will also play a key role in achieving the UK’s net zero ambitions. We’re delighted to have secured two excellent panels for our events, at a time when we will have an increased spotlight on our industry and its role, as we look to the UK’s energy future.”

At the heart of the report is industry’s shared ambition for the future, outlined in Vision 2035. The report will reflect on the Our Vision, Our Future engagement with industry, and provide an understanding on the steps required to ensure that the oil and gas industry can continue to remain a key contributor to the UK energy mix.

Graham Hollis, a senior partner in Aberdeen for Deloitte, said, “The insights offered by the OGUK economic report are a strong indication of how well the industry is doing, and they provide a key opportunity to assess how the oil & gas sector can continue to move forward to Vision 2035 and evolve with the changing energy landscape. As an industry that has demonstrated great resilience and a willingness to adapt, particularly in recent years, the oil & gas sector has a crucial role to perform towards ensuring the future, sustainable energy mix.”

The Aberdeen event is being held from 07:00-09:00, today, at the P&J Live. The report’s findings will be released for publication during tomorrow morning. ●

Enpro Subsea showcases pioneering R&D programme during Scottish ministerial visit

Aberdeen-based Enpro Subsea showcased the results of a pioneering subsea technology R&D programme during a recent visit from Member of Scottish Parliament Jamie Hepburn, Minister for Business, Fair Work and Skills, **FIG. 1**.

The production optimisation specialty firm demonstrated its latest Subsea Safety Module (SSM), a key flow intervention services technology (FIS), at its facility in Inverurie, Aberdeenshire. The module was developed with the assistance of a £755,000 R&D grant from Scottish Enterprise.

Increased capabilities. To date, its 10-k pressure version of FIS has provided well stimulation for multiple campaigns in West Africa. The system has been proven to improve production, by stimulating the reservoir and increasing the ultimate recovery from existing subsea wells. This latest development increases the SSM's operating capabilities to support higher-pressure (15-ksi) wells, common in the Gulf of Mexico and West Africa. The new module is also configurable for other subsea chemical injection treatments, including hydrate remediate and flow assurance management.

The system can be deployed from an ROV support vessel or construction support vessel. By eliminating the need for a rig, operator savings can reach up to 70% of traditional vessel and support costs, potentially worth US\$12 million on a 30-day multi-well intervention campaign.

Tom Bryce, Enpro Subsea marketing

director, said: "As the industry continues to focus on maximising recovery from their existing assets, new technology is essential. This investment, combined with R&D funding from Scottish Enterprise, provided us with the ideal opportunity to increase our capabilities in the deepwater intervention arena, building on our success to date. It was a great opportunity to be able to showcase this new technology to Mr. Hepburn during his visit and thank Scottish Enterprise for their continued support."

Versatility. As a modular system, the SSM can be used with any subsea flow access point to gain access to well or pipeline flow, including the company's proprietary flow access module (FAM) technology. In addition to facilitating hydraulic intervention, the FAM open architecture has been selected by operators as an enabling technology for subsea production systems standardisation, leading to early first oil and future-proof field development strategies.

"Installing FAM hubs enables operators to retrofit any technology to its subsea architecture or react to any production challenges in future field life," explained Bryce. "FAM creates an enhanced production 'USB port' within the jumper envelope, which enables the use of standard subsea Xmas trees and manifolds, with the FAM providing life of field flexibility within the system design."

FAM delivers "smart standardisation," enabling a range of production-enhanc-

ing technologies for metering, flow measurement, flow assurance, and digital data access to be installed at any stage throughout life of field. The company uses this "smart standardisation" to link with existing subsea infrastructure, Xmas trees and manifolds, and return significant cost-savings during well operations.

The combination of FIS and FAM products throughout life of field delivers maximum recovery from all subsea wells while minimising risk and cost.

The business has seen more than 60 of its subsea FAMs adopted by operators in key regions since the product was launched

2016. The team now aims to increase sales over the next two years, in line with its international business plan. Enpro Subsea has 45 personnel across its operational bases in Aberdeen, Houston and Ghana.

Bryce added: "Looking ahead, we are focusing on high-integrity pressure protection system (HIPPS), pumping and data acquisition solutions using the same technology. FAM enables an open subsea architecture, allowing any subsea processing hardware to be retrofitted onto any well."

Enpro Subsea is exhibiting at SPE Offshore Europe 2019 in Aberdeen this week, on stand 3J39. •



FIG. 1. Enpro Subsea Managing Director Ian Donald (left) hosts MSP and Minister for Business, Fair Work and Skills, Jamie Hepburn, during his visit to the firm's facility in Inverurie, Aberdeenshire. Image: Enpro Subsea.

Dive into opportunity with *World Oil's* full access plan

Leverage exclusive forecast data, technical case studies, engineering data tables, maps and more.

Subscribe today!
WorldOil.com/Subscribe



New technologies that help operators succeed in the new normal

WEIR OIL AND GAS

Oil and gas operators have struggled to optimize their processes to succeed in the new normal of the upstream industry. Adjusting to this new paradigm has been dramatic, with entire supply chains being completely transformed. Innovative technological advancements made these shifts possible, and it will be innovative technologies that continue to give European offshore operators competitive advantages that improve their bottom lines and maximize returns for shareholders.

Committed to the 3Ps. As one of the oldest industrial companies with 150 years of uninterrupted service to the industry, Weir Oil & Gas is committed to remaining at the leading edge of such innovation, to

help operators maximize the 3Ps: People, Planet and Profits. Digitization of the oil field is a key element, as it enables companies to extract the maximum amount of resources from wells while reducing costs and nonproductive time.

Digitization efforts. For instance, our Asset Management Program (AMP) with SPM® RFID technology utilizes a proprietary Mobile App to put current inventory and equipment certifications data in the palm of operators' hands, **FIG. 1**. Weir's RFID AMP technology can allow 900 pieces of iron to be tagged and accounted for in less than 60 minutes, complete with certificates. That is a 90% reduction over outdated manual

inventory efforts. Relying on the company's optical character recognition technology, operators can accurately upload certificates—regardless of the issuing inspection organization—into a single storage location in the cloud, allowing for immediate retrieval to avoid unnecessary downtime. Thus, operators can track every piece of iron anywhere in the world, at any given moment.

Maintenance. Weir also has leveraged technological advancements to enable operators to better maintain legacy equipment. By creatively combining computer-aided design, 3D scanning and additive manufacturing with materials sciences, the company creates custom

rebuild solutions and parts that make decades-old legacy equipment run like new. This enables operators to enjoy more lifespan from their investments. This is Weir's Advance Parts Solutions (APS) service offering. Its re-engineered solutions are not only 30% less expensive than new OEM equipment purchases, but they also provide a reliable, engineering-driven solution to replace outdated and obsolete parts with current high-performance materials.

Three-pronged approach. Weir Edge™ Services is a global service offering that utilizes a three-pronged approach that includes global access to local engineering experts, engineered repairs with highly skilled aftermarket support, and industry-leading digital empowerment tools for Weir-built and other OEM equipment. Backed by the technology mentioned above, as well as engineering expertise, Weir also offers maintenance and operational contracts for oil and gas companies, as well as power plants to provide local support and advanced training. Indeed, many IOCs contract with Weir Oil & Gas for plant maintenance, including one company that contracts with the company to provide global maintenance services for gas compressor units and associated equipment.

Weir will continue to leverage technological advances to help operators succeed in the new realities of the upstream oil and gas industry. Healthy bottom lines and shareholder returns are positively impacted through the application of digitization and localization. ●

2019 HIGHLIGHTS

WALK THE EXHIBITION FLOOR



Ensure you are up-to-date with the latest innovative Upstream technologies by connecting with 800+ E&P suppliers on the exhibition floor. Speak with technical experts, watch 1000's of demonstrations, and hear case studies from a wide range of industry suppliers. Create valuable partnerships with the 35,000+ attendees from over 100 countries worldwide.

ENGENIOUS ZONE - HALL 1 - NEW FOR 2019



After the success of ENGenious 2018, we are proud to introduce the ENGenious zone at OE. Tying in perfectly with OE's 2019 focus on data analytics, machine learning and artificial intelligence, 'ENGenious at OE' provides innovators with a platform to demonstrate their capabilities before ENGenious returns in 2020.



ENERGY TRANSITION HUB - HALL 1 - NEW FOR 2019

New for 2019 is the Energy Transition Hub, where operators, associations and technology companies will share insight's over the course of the event. They will highlight the efforts they are making to prepare the oil & gas sector for transition to a lower carbon future, with less environmental impact.

STARTUP VILLAGE - HALL 1 - NEW FOR 2019



StartUp Village 2019

The StartUp Village is a new feature at OE19. It is a zone that will allow new UK and International start-up companies to showcase their latest technologies, products and solutions launched, and make these innovations easy to find for our visitors.

FREE SPE CONFERENCE



All attendees to SPE Offshore Europe are invited to attend the free of charge conference, themed 'Breakthrough to Excellence - Our License to Operate.'

MICHAEL BORRELL CHAIR, SPE OFFSHORE EUROPE 2019

"SPE Offshore Europe 2019 will allow the industry to come together and discuss what really matters, it will be important to talk about keeping our costs low, pushing the boundaries of innovation and focusing on excellence in our operations".

STEPHEN HOLTZ SPE OFFSHORE EUROPE 2019 TECHNICAL COMMITTEE CHAIR

The 70+ technical presentations will address key disciplines including Data Analytics, New Technology for Late Life Development, Subsea Technology, Process Safety Management plus many more.

LATE LIFE AND DECOMMISSIONING ZONE - HALL 1



Late Life & Decommissioning Zone

Our highly popular Late Life & Decommissioning Zone will return in 2019. This free-to-attend zone includes decommissioning technology and a conference theatre programme created with the industry's key associations.

For help, visit any of our information points or tweet us using #AskOE



Get the Official SPE Offshore Europe Event App

Plan your visit and participate at **OE19**, with all of the essential information and tools right at your fingertips. From your personalised recommendations and diary management to networking and wayfinding on the show floor, the power is in your hands with the app.

Making the most of your time has just become a lot easier - download the app today.



TO DOWNLOAD, VISIT OFFSHORE-EUROPE.CO.UK/APP

AVAILABLE ON



FIG. 1. With RFID technology in the palm of an operator's hand, up to 900 pieces of iron can be tagged and accounted for in under 60 min.

Two significant contracts awarded to refurbish the *Well-Safe Guardian*

WELL-SAFE SOLUTIONS

Well-Safe Solutions recently announced the award of two multi-million-pound contracts to continue refurbishment of the *Well-Safe Guardian*, the decommissioning company's first asset, into a bespoke plug-and-abandonment unit, **FIG. 1**. Global Energy Group and Rigfit7Seas have been appointed to deliver the ambitious upgrade of the semisubmersible drilling rig.

Scope of work. Global Energy Group will provide quayside services and the paintwork scope, while Rigfit7Seas will provide accommodation upgrade services. Well-Safe is progressing in a timely manner with refurbishment work on the asset, which it acquired earlier this summer. As part of the upgrade, Well-Safe will be installing a dive system and the capability to deploy an SIL (subsea intervention lubricator).

Well-Safe Solutions CEO Phil Milton said, "The award of these contracts, within the timeframes we committed to, will ensure that this bespoke plug-and-abandonment asset will be available to the industry in 2020." Global Energy Group, which has been supporting Well-Safe with marine operations and quayside services since April of this year, following acquisition of the asset, has secured the contract to support the upgrades and life extension works at the Port of Nigg.

Stuart Paterson, managing director for Global Energy Group, Access & Coatings,

commented, "We are thrilled to have been awarded this contract to bring the flagship semisubmersible up to standard. Creating opportunity for additional employment, we expect to have in the region of 80 personnel engaged in various work scopes until the end of the year. Working in partnership with Well-Safe, Global Energy Group will provide fully encapsulated scaffold access, and blast and paint services, along with the provision of rope access personnel, mobile cranes, plant and labour, workboats, and onsite facilities for the duration of the rig's yard stay at our Nigg Energy Park facility."

Rigfit7Seas Group Managing Director Brian Knowles said, "We are delighted that Well-Safe has chosen Rigfit7Seas to carry out this sizeable scope on their flagship project. As the leading contractor in the market for accommodation upgrade services, this award will see Rigfit7Seas execute another project destined for operation in the North Sea. The project award further enhances our already extensive offering in the international marketplace and, at peak, will secure around 50 jobs across our engineering and construction teams for approximately 100 days, starting immediately."

Finding a niche. Launched in August 2017, with the vision to become a "Tier One" wells decommissioning company, Aberdeen-based Well-Safe Solutions boasts

over 500 wells worth of experience among its staff. With the *Well-Safe Guardian*, the company is firmly on track to deliver a complete P&A solution to its clients.

Milton added, "We believe we are now a key part of helping the industry achieve its 35% decommissioning cost reduction target. Joint well plug-and-abandonment campaigns, using our club approach, will not only be more cost-efficient, but also help build UK supply chain expertise in decommissioning."

Being part of Well-Safe's Plug and Abandonment club, which Milton refers to, gives clients access to the firm's unique

vehicle to de-risk profiles of well inventory, with fixed-rate guarantees, flexible delivery options, and future budget certainty, as part of an industrial base process. The P&A Club provides an open, trusted knowledge-sharing platform that helps to deliver continuous improvement to delivery performance, driving future-proof solutions within a safe, collaborative environment.

Research has indicated that there are over 33,000 wells worldwide to be decommissioned over the next 20 years. Well-Safe's long-term goal is to export its model and advance from the UK into the global marketplace. ●



FIG. 1. Two companies will be involved in conducting significant refurbishments to the *Well-Safe Guardian* semisubmersible. Image: Well-Safe Solutions.

**PETROLEUM
ECONOMIST**

Join the enlightened ranks of *Petroleum Economist* subscribers today



Take an exclusive 4-week trial to
Petroleum-Economist.com and
get access to our essential energy
intelligence

Our impartial, reliable and rigorous
reporting is easy to absorb and
used to inform strategic decisions
at the highest level

Register for your access details at
Petroleum-Economist.com/OEshow

or phone our subscriptions team on
+44 20 3409 2244

KW Designed Solutions expands pressure testing capabilities

KW DESIGNED SOLUTIONS

UK-based high-pressure engineering company, KW Designed Solutions, has recently restructured; launching a new



FIG. 1. KW Designed Solutions' Pressure Testing in-house pressure testing system.

company, KW Pressure Testing, and introducing the KW Group to manage them both. KW Pressure Testing is developing a new in-house pressure testing facility at their UK headquarters, due to open this autumn. The facility will offer hyperbaric, hydrostatic, gas, submerged gas, environmental, full qualification, type approval and factory acceptance testing, FIG. 1. Utilising fully automated pressure and temperature control systems, all tests will be carried out under the watchful eye of the team, under strict safety regulations.

Other new additions include the creation of an internal controls division, developed to provide the specifica-



FIG. 2. KW Designed Solutions' automated systems and process control equipment.

tion and design of automated systems and process control equipment, FIG. 2. This will open up the team's expertise to a wide range of additional markets, including pharmaceutical, food and allied industries.

Future innovation. Instability in the oil and gas market spurred the company to review its structure, processes and to explore new ventures, including expansion into both new and existing markets in North and South America, Canada and Norway; collaboration with a partner company in France; the appointment of key personnel; a move to a new 8,000 ft² premises; and ambitious plans to aid future growth. KW Designed Solutions has been designing, manufacturing and installing special-purpose pressure testing vessels, pressure testing equipment, and associated pressure control systems to the global oil and gas, subsea, material science, universities and nuclear markets since 2004.

The bespoke products enable companies to develop, approval-test and production-test their equipment and materials by accurately simulating extreme deepwater subsea conditions. This proves suitability for use in high-pressure environments and high/low temperature operation, ensuring durability, corrosion resistance, product lifespan and compliance to industry standards.

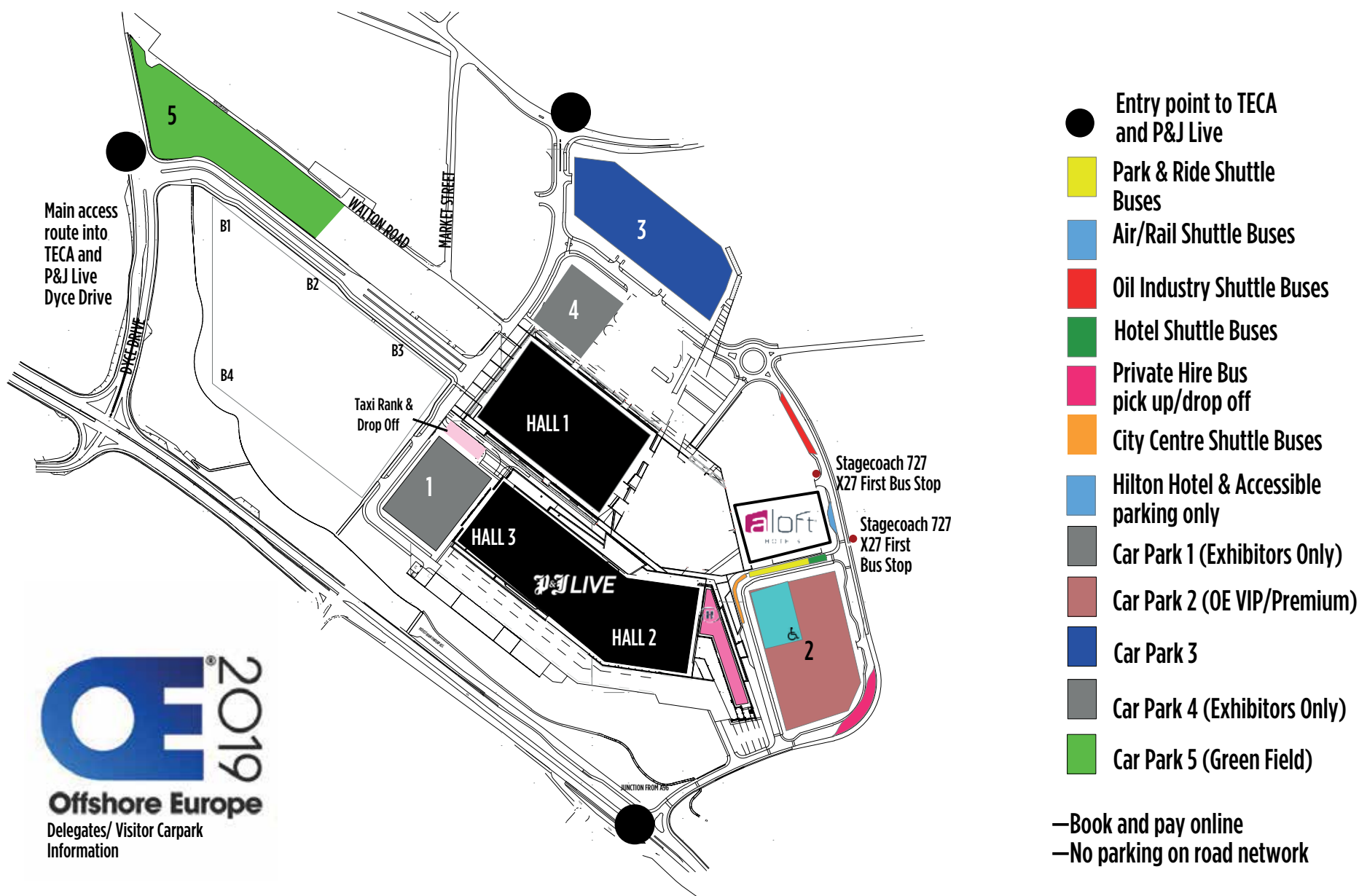
A new identity. It became clear that the company's visual identity should also evolve, to reflect the many changes happening within the company. The new branding will help to easily identify the company throughout the UK, global subsea and other key markets.

The new branding, and both KW Designed Solutions and KW Pressure Testing's new websites, will launch at the beginning of September, to coincide with the company exhibiting at this year's SPE Offshore Europe, on Stand 3G70—the NOF Pavilion, from the 3rd-6th September.

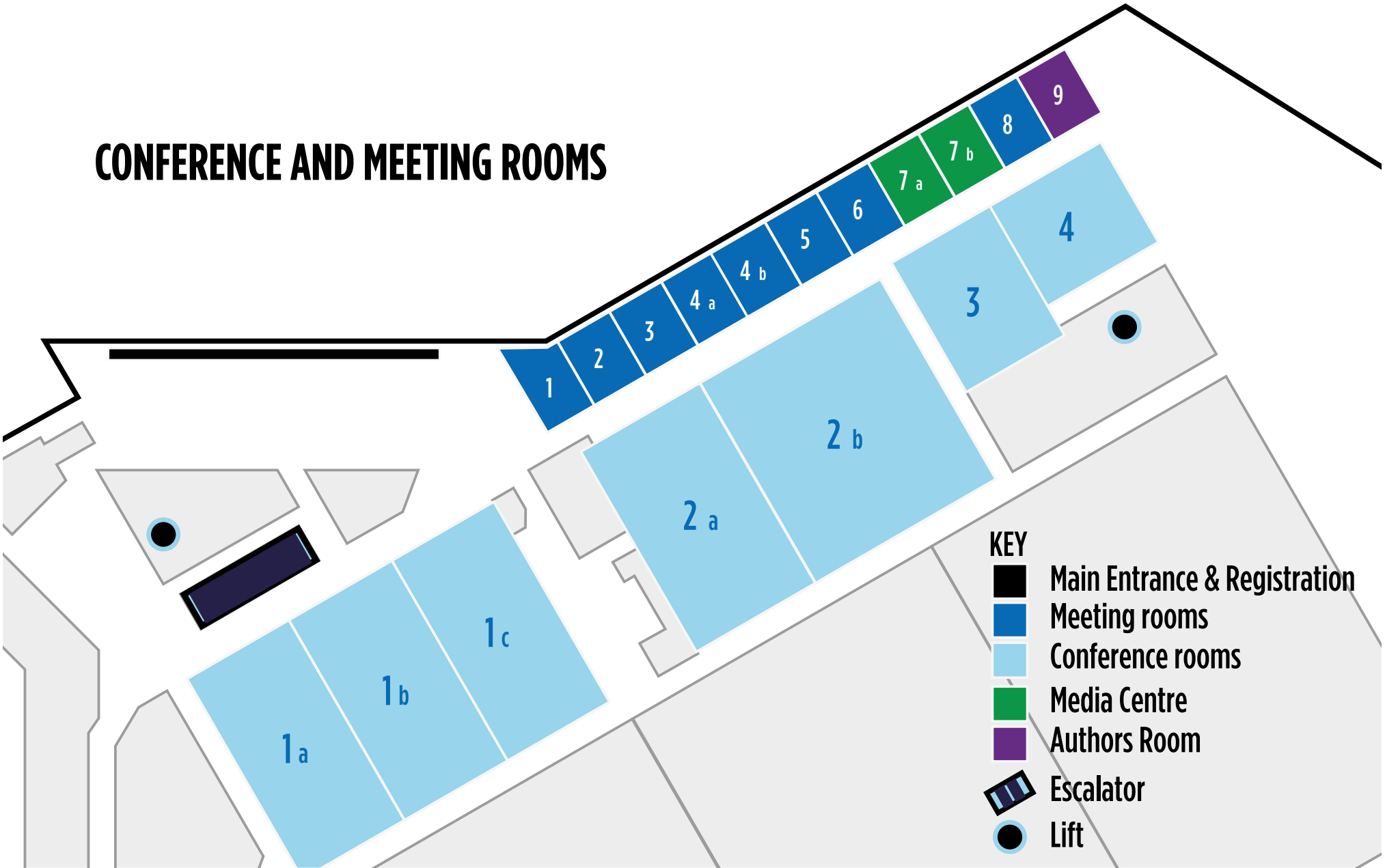
The changes implemented have proven successful thus far, with the company recently celebrating a record financial year, increasing the turnover five-fold in FY2018/19 and winning many new global contracts. The team is busy designing and manufacturing equipment to their customers' unique projects and application requirements.

Mark Henderson, commercial director, explains "We have spent a great deal of time ensuring that our new branding reflects the changing structure of the company, and the expertise, innovation and professionalism of our team, and it helps to further strengthen our name in the market. We hope it will help to aid our ambitious objective for the future: to be seen as a global leader in high-pressure engineered solutions." ●

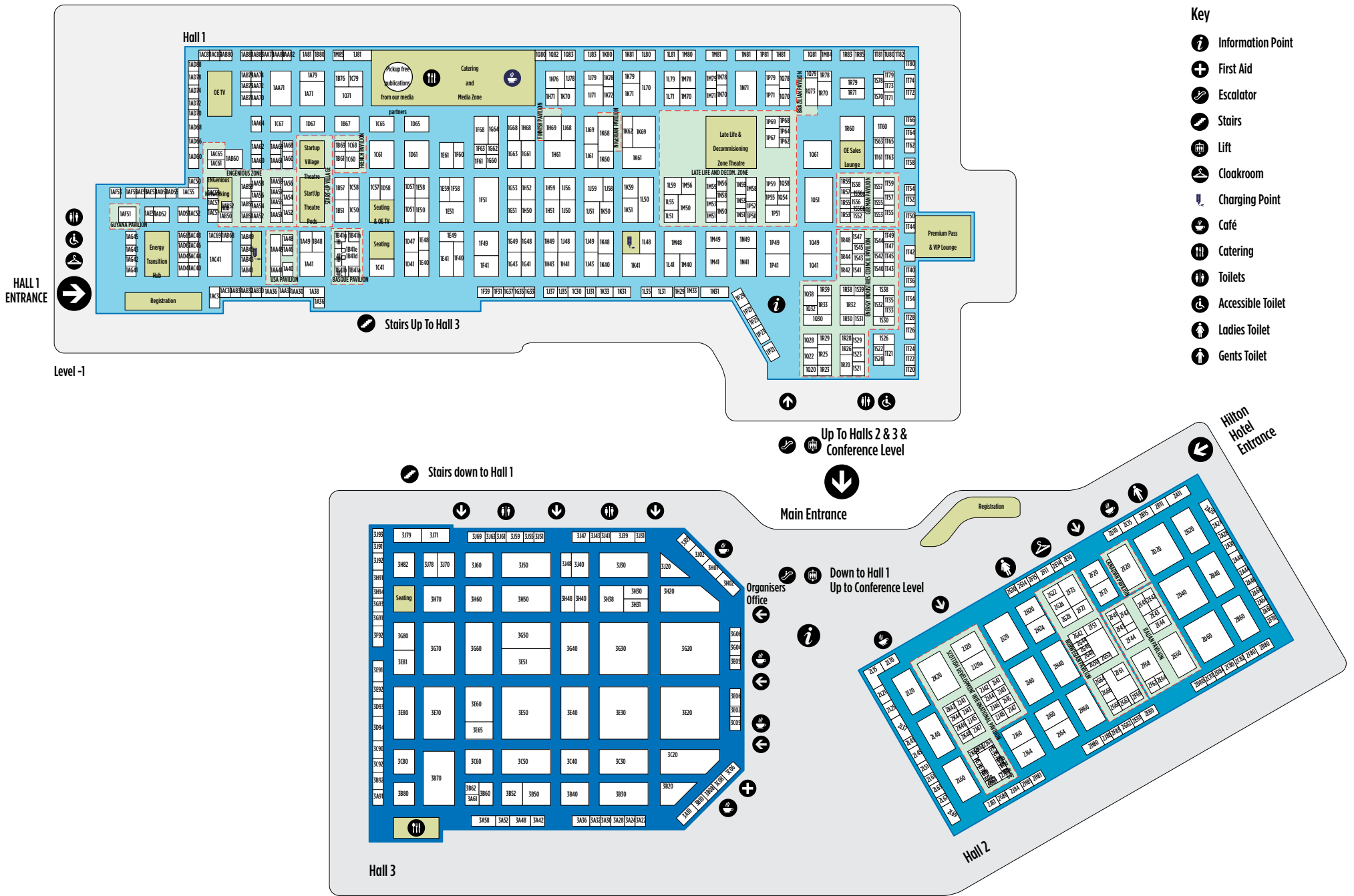
SPE OFFSHORE EUROPE 2019 SITE PLAN



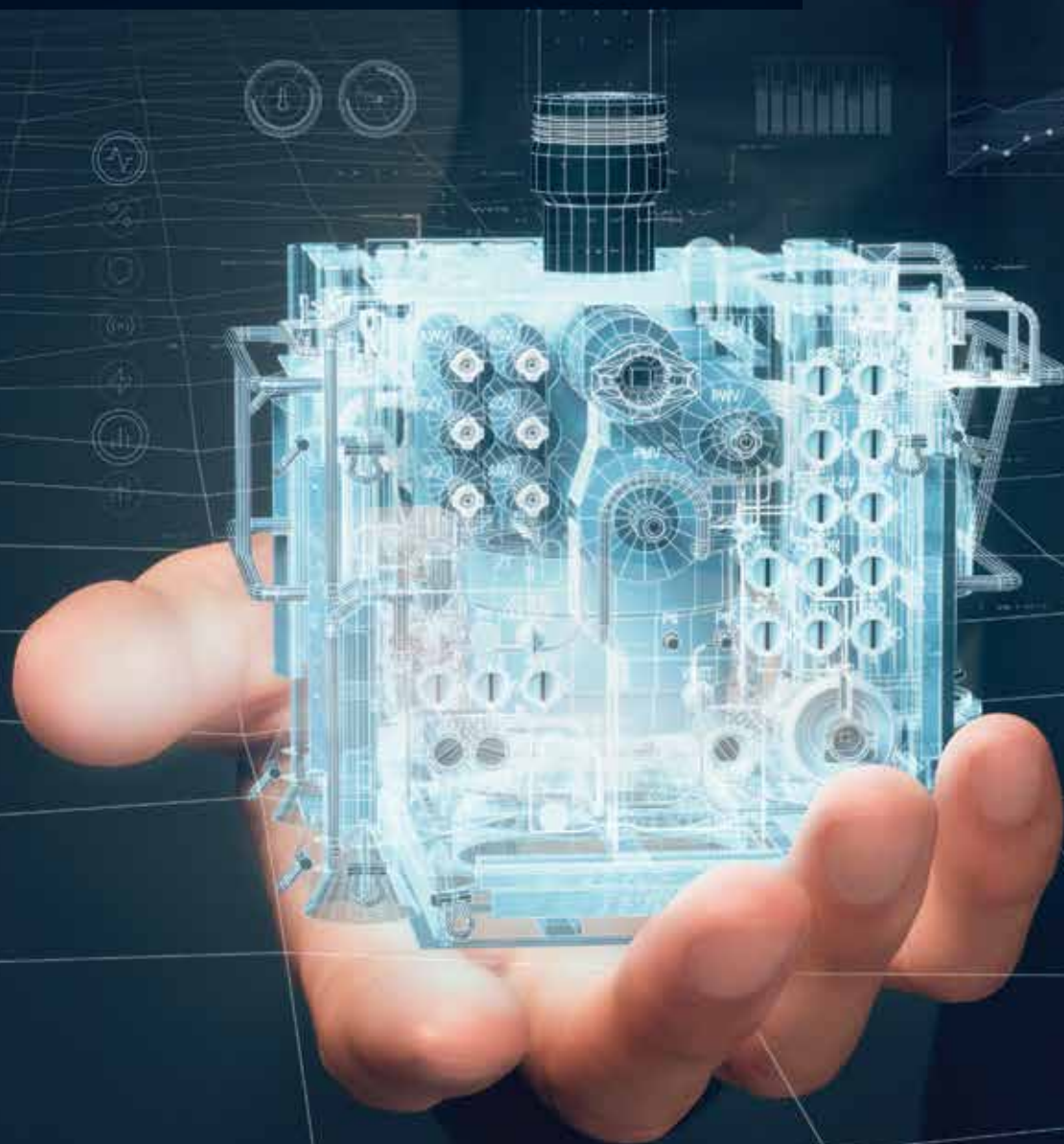
CONFERENCE AND MEETING ROOMS



Exhibition



Integrated Design Accelerated Development Maximized Performance



Our digitally enabled, intelligent solutions are revolutionizing subsea developments – enhancing recovery, saving cost and increasing value through life of field.

We call it Intelligent Subsea.