

October 2018

SPE Review London

The official e-magazine of the Society of Petroleum Engineers' London branch

Oilfield Digitalization ECONOMIC IMPACT

Is this the long-promised yield of efficiencies and economic benefits to assets of all maturity levels?

PLUS+

- Letter from the Chair
- Protecting Our People:
H&S in the Offshore Oil and Gas Industry 2018



BEHIND THE SCENES

MEET THE BOARD

EVENTS

JOBS

SPE Review London

The official e-magazine of the Society of Petroleum Engineers' London branch

ABOUT US

The Society of Petroleum Engineers (SPE) is a not-for-profit professional association whose members are engaged in energy resources, development and production. SPE serves more than 143,000 members in 141 countries worldwide. SPE is a key resource for technical knowledge related to the oil and gas exploration and production industry and provides services through its global events, publications, events, training courses and online resources at www.spe.org. SPE London section publishes SPE Review London, an online newsletter, 10 times a year, which is digitally sent to its 3000+ members. If you have read this issue and would like to join the SPE and receive your own copy of SPE Review London, as well as many other benefits – or you know a friend or colleague who would like to join – please visit www.spe.org for an application form.

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Share your experiences and stories online

<http://london.spe.org/home>



Behind the Scenes: SPE Review Editorial Board



Jonathan Ovens

Ph.D in Physics at Cambridge University.

Joined Shell in 1986. Reservoir Engineer – hydraulic fracturing, pressure transient analysis and reservoir simulation.

1997 - 2012: independent consultant: North Sea, North Africa and the Middle East.

Experience: Exploration and Development planning to Reserves Evaluation.

2013: Senior Reservoir Engineer at JX Nippon E&P (UK) Ltd.

2009 and 2015 served with SPE Europe Technical Committee.

Member of the SPE London Board.

Josh Beinke

Graduated from University of Adelaide in 2008 with a Petroleum Engineering degree.

Worked various roles with Chevron, Origin Energy and Santos, including as a

Production Engineer on the Gorgon Field during First Gas. Following move to Europe

in 2016, consulted on European and African assets (specialising in data room and field

development advisory) before current position working in Amsterdam as a

Production/Exploitation Engineer with Vermilion Energy.



Ffion Llwyd-Jones

Editor and business writer, with 15+ years experience in North America/ UK.

Editor for several trade and consumer magazines (print and/online).

Provides industry-related case studies, and detailed, research-driven B2B Designer reports and technical white papers.

Accomplished photographer, and videographer.

Educated in Canada, and in the UK, with BA (Hons) from The Open University.

A background image for an advertisement showing the London skyline at sunset, with the London Eye and Big Ben visible. A person is seen from behind, standing on a bridge railing and looking at the city.

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London Technical and Commercial
Energy Community

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Letter from the SPE London Chair

Dear colleagues and friends,

As the year-end approaches we are getting reminders about renewing our SPE membership.

When I received such a reminder earlier this month it made me think – what has SPE actually done for me?

By the way, if you are a regular reader of SPE Review London you should remember that we asked this question to some of our members in the past (SPE Review London April/May 2018 issues).

As a reservoir and petroleum engineer, it should be no surprise that I've been involved with SPE in various ways for many years.

First, as an SPE member, I – like many of you – took advantage of accessing the latest publications on E&P technologies and trends in the JPT magazine, searching for the needed technical documentation in OnePetro online library, following industry insights at various conferences and workshops as well as online webinars. You can find out more about membership benefits: <https://www.spe.org/members/benefits.php>.

Also extremely valuable was becoming an active volunteer within SPE. As a student, I volunteered with the University Students Chapter (IFP School in Paris), and after graduation I became involved with the professional London Section. Playing an active volunteering role has given me an opportunity to develop various skillsets in organising and marketing events, analysing the social media response, maintaining the events balance sheet and much more. Development of interpersonal professional relationships has been of enormous value, as well as building leadership skills and gaining understanding in how non-profit boards are organized and run.

We are always interested in your insights as to why SPE membership is valuable for you. It would be great if you can share them with us by writing to SPELondon@spemail.org. We can then publish the most interesting stories on our social media channels, website and online magazine.

Meanwhile, for those who are new to SPE and would like to learn more about the member opportunities and how to become one – please visit www.spe.org/join.

Kind regards,

Dr Olga Bradulina
SPE Chairperson





London Section

Introduction to Oil and Gas Exploration & Production

15th November 2018
Geological Society, Piccadilly, London



This one day seminar summarises the full life cycle of oil and gas fields, covering the basics in exploration, geoscience, drilling, operations, reservoir management and commercial terms. The speakers will also discuss key industry issues, followed by Q&A and networking.

You will learn about:

- Key industry issues
- All stages of the E&P cycle
- M&A and Private Equity
- Fracking

Who is this for?

People working in financial and E&P environments, who are new to the petroleum industry, or want to know more about oil and gas projects

| | | |
|-------------|-----------------|----------------------|
| Graduates | IT and Big Data | Finance Staff |
| Legal Staff | Secretarial | Logistics |
| Investors | Recruitment | HSE |
| Analysts | Accountants | Technical Assistants |

This seminar is about communicating complex ideas to a non-technical audience... no prior experience needed!

Tickets and Questions



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<https://www.spe-london.org/>

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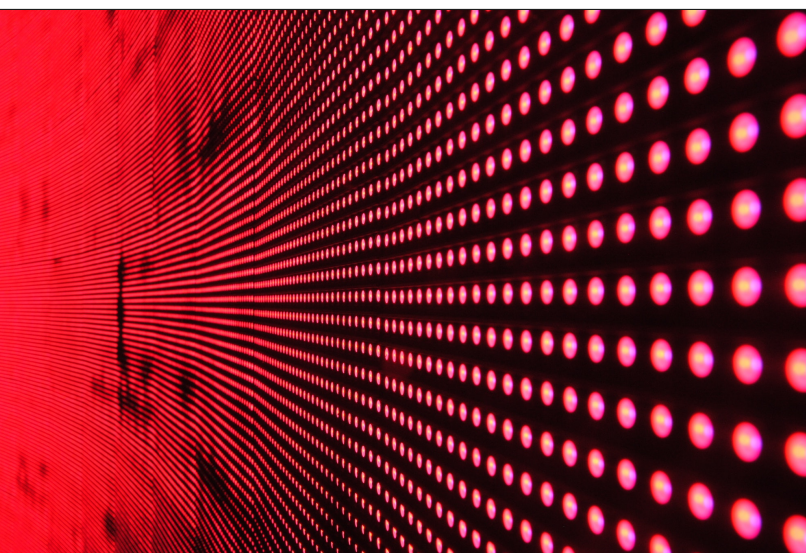
Evaluating the Economic Impact of Oilfield Digitalization

Editor's Note:

The digitalization of the oil and gas industry has long promised to yield a multitude of efficiencies and economic benefits to assets of all maturity levels. With the focus on cost savings over the latest price cycle this topic has come to the fore and many operators and service providers are designing, implementing and improving upon digitalization solutions to optimise the management of their asset.

The accelerating maturation of this field was well represented this month, with the opening session of the ATCE 2018 in Dallas focussing on “Translating Big Data into Business Results”, while the October JPT explored the application of Artificial Intelligence through several case studies.

In this articulation of his recent presentation to the London SPE community, **Omer Ahmed** details how companies such as Shell are digitalizing their oilfields to maintain production and minimise costs, and highlights the importance of transparency in communicating the results of these digital initiatives in order to stimulate capital funding for further innovation.



Fossil fuel economics have undergone a tremendous shift in recent years. This shift was caused by a several factors, including environmental and global warming concerns, electric vehicles, and increased competition from the shale hydrocarbon market. This has led some major oil and gas companies to forecast energy transition scenarios which eliminate fossil fuels from the energy mix altogether, within a generation. The oil and gas industry is capital intensive and with large volumes of unexploited hydrocarbon resources, faces the challenge of extending economic life in order to produce these volumes. This article explores a possible part of this solution and evaluates the economic impact of upstream oil and gas digitization.

The International Energy Agency (IEA) defines digitalization as a term that encompasses many technologies describing the growing application of information technology across the economy [1], while a World Economic Forum (WEF) report predicts savings of \$2.5 trillion to be achieved by adopting digital technologies within the next seven years [2].

These digital and smart technologies include automation, robotics, connected equipment, artificial intelligent and data analytics, and improve the economics of finding and producing hydrocarbons through productivity improvement and cost reduction. A Wood Mackenzie Global Upstream Cost Survey stated that by the end of 2018 the industry is expecting to reduce operating cost by 28% (from 2015 levels) [3], while a Deloitte USA oil and gas industry executive survey attributed 31% of efficiency gains to digital technology [4].

Upstream costs comprise costs related to operation such as replacing defective meters, repairing broken flow lines, lubricating production equipment, pumping costs, meter reading, measuring the tank levels, repairing sucker rods, tubing, casing, cleaning and cost of materials, as well as the purchase and maintenance of supplies and fuel used in well and surface facility operations. Various oilfield digital technologies help manage these costs.



* **The Industrial Internet of Things (IIOT)** and programmable logic controllers, scalable computing, edge and cloud, secure network infrastructure and asset performance management systems play an increasingly major role in achieving performance gains in the oil and gas industry. Economic benefits follow through reducing unplanned downtime, improving efficiency through deploying intelligent wellfields equipped with digitally enabled wired systems, production optimization, and improved reliability, preventative maintenance and equipment condition monitoring.

* **Predictive analysis** assists upstream projects to solve repair and maintenance crew problems by analysing failure patterns, failure modes, equipment categories and identifying characteristics associated with particular manufacturer or equipment types.

* **Radio frequency identification tagging** of equipment enables applications to monitor the condition of equipment and support predictive maintenance.

* **Cloud technology with digital storage and data management** features enable intelligent solutions to lower expenses. Improved data measurement, transmission, storage and retrieval enables better decision making throughout well intervention and production operations, as well as linking different functions within the organisation (e.g. access control, finance and accounting, human resources, engineering, purchasing and project management). Similarly, adopting cloud infrastructure allows the “pay as you use” model to operate and offers savings on the cost of investing to acquire, manage and maintain IT hardware and software, shifting and reducing IT costs from capex to opex.

Finally, data transmission bottlenecks associated with remote locations (where fibre optic and broadband are not available), can use current **edge analytics** technologies which allow data to be analysed, summarised and transmitted from the wellsite through satellite link to a data centre.

Case Study – Royal Dutch Shell

Shell’s upstream sector managed to maintain both production volume and crew numbers from 2008 through to 2017, consistently producing between three and three and half million barrels of oil equivalent per day during this period.

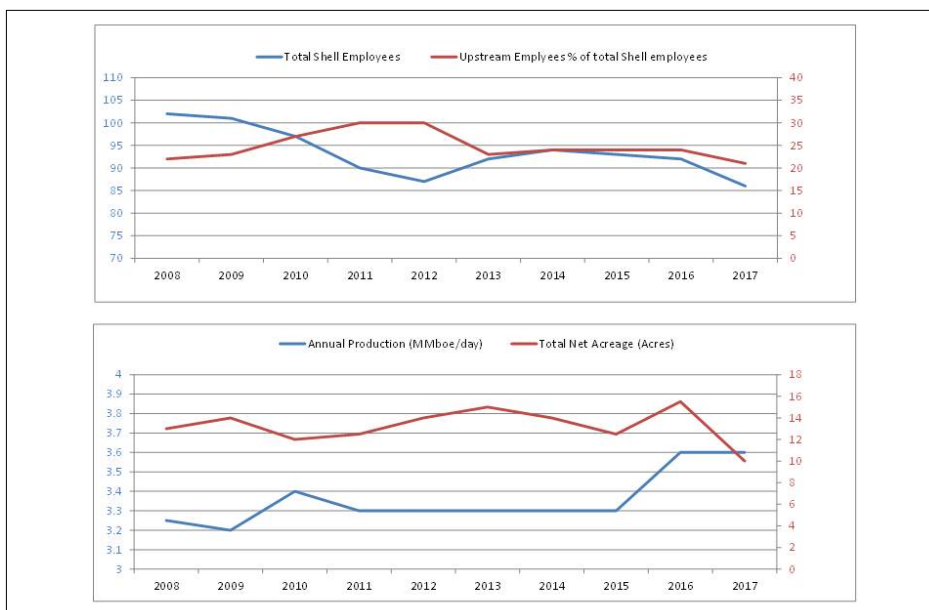


Figure 1: Shell Production and Employee numbers, 2008 - 2017

Considering the finite nature of hydrocarbon resources this reflects success in resource replacement and therefore performance improvement. Evaluation yielded several digital technologies (e.g. PI OSI platform, WISense, JewelEarth) which individually demonstrated substantial cost savings for the company both in terms of opex and capex, however overall upstream sector analysis deemed their impact immaterial. Unfortunately this lack of granularity, as well as the lack of published reports relating to digital technology

investment and expected useful life of these investments did not enable the establishment of trends linking

digital technology adoption to substantial financial and operating performance improvement.

Oilfield Economics and the Way Forward

Oil and gas companies (like Royal Dutch Shell) publish audited and unaudited reports [5]. These reports are mainly intended for the capital markets and therefore contain detailed information about equity, bonds, current financial position and future financial prospect. While they contain detailed information on the source of funding, when attempting to assess the application of these funds the research found aggregated values under property, plant and equipment. This was despite the aggregated value representing between 40 and 60% of Shell total capitalization, while bonds and long term debt (for example) constituted less than 20% of balance sheet value yet a large part of reporting was dedicated to detailing their composition, coupon rate, settlement date and other bond details.

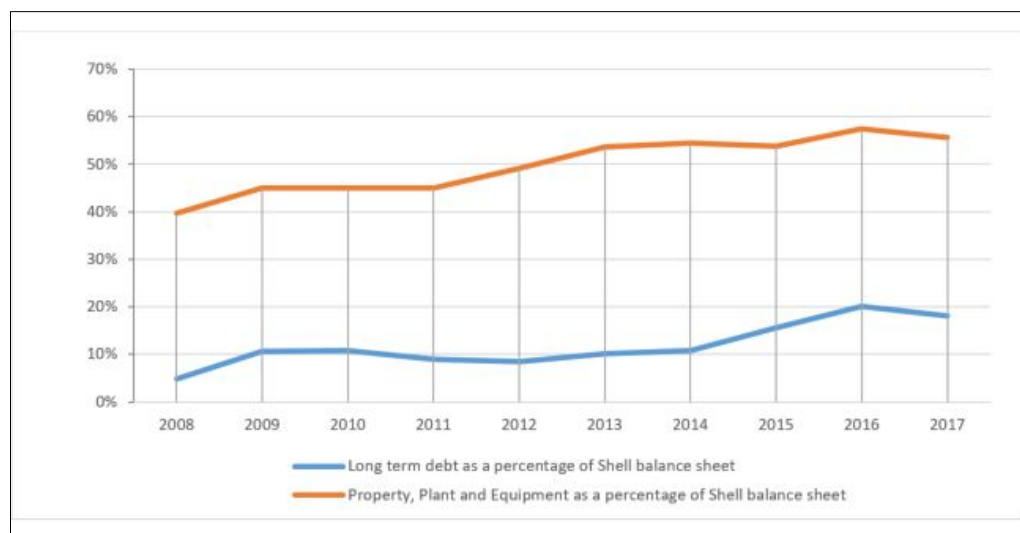


Figure 2: Shell Balance Sheet Debt

Measuring digitalization benefits in the upstream oil and gas industry would encourage digital savvy projects to enter the market, have access to funding and contribute to reducing the breakeven cost of barrel. This requires developing a benchmarking mechanism similar to those used by the bond market where a

rating agency provides independent opinion on credit worthiness of bond issuers. Similarly, digital vendors, upstream operators and audit firms could cooperate to provide opinion on potential performance gains from adopting particular digital technology based on measured historic performance.

By better demonstrating the impact of digitalisation on the hydrocarbon economy, this would attract new investment and in turn attracting more and more digital players and talent. This would lead to the continued development of novel ways to assist in energy generation, further incentivising capital markets to invest more capital into digital savvy energy enterprises to ultimately improve the bottom line of the oil and gas industry.

[1] <https://www.iea.org/digital/>

[2] <http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-executive-summary-20180510.pdf>

[3] <https://www.woodmac.com/press-releases/can-upstream-cost-savings-stick/>

[4] https://www2.deloitte.com/content/dam/insights/us/articles/4181_embracing-a-digital-future/embracing-a-digital-future.pdf

[5] <https://www.shell.com/investors/financial-reporting/annual-publications.html>



The London Decision Quality Group, European Decision Professionals Network and Society of Decision Professionals are convening a multi-industry conference in London this year, under the theme.

“Decision Quality: Making Good Outcomes More Likely”

Behavioural science suggests that human nature favours decisions that satisfy (*eg just meets threshold targets*) rather than those that optimise. Often, value gets left on the table and worse still, may get destroyed, particularly when risks & uncertainties are involved.

This conference provides you with access to the knowledge and experience of internationally recognized Decision Professionals, who can help you master practical approaches which deliver quality decisions, thus enabling you to optimise rather than just survive.



The conference is followed by a short course on
“Leading Decision Quality”
sponsored by the Society of Decision Professionals.

Location: Geological Society London, Burlington House, Piccadilly, Mayfair, London, England, W1J 0BD

Dates: **Conference:** 5th & 6th November 2018 – **Short-course:** 7th November 2018

To Register: http://www.edpn.org/wp/?page_id=571

Protecting our People: Health and Safety in the Offshore Oil and Gas Industry 2018

The 2018 Oil & Gas UK Health & Safety Report provides an overview of the offshore oil and gas industry's performance in health and safety in 2017, and of activities Oil & Gas UK groups have undertaken to protect the people who work in the industry.

Here is a summary of the 48-page report.

Key findings

On a positive note, there were zero work-related fatalities in 2017 and reportable incidents were the lowest on record. In addition, offshore helicopter operations in 2017 were conducted without accident, and there was a decrease in the five-year accident rate.

On the health side, the number of medicals increased, with suspected cardiac incidents calling for medivacs; blood pressure and diabetes were the most common health conditions causing people to fail the offshore medical.

2017 Performance

The oil&gas industry uses performance indicators to monitor safe operations as part of its commitment to protect people, the natural environment and assets. The primary focus is on process and personal safety, and the containment of hydrocarbons and associated hazards.

Process and Personal Safety

Reportable Incidents

Defined incident types with high potential to cause significant injuries, termed dangerous occurrences, and other defined incidents must be reported to the Health and Safety Executive (HSE). In 2017, there were 255 such incidents, 67 per cent lower than in 2000-01.

Hydrocarbon Releases

The criteria for reportable hydrocarbon release (HCRs) has changed from what was effectively two reporting regimes to uniform reporting from July 2018. Reported HCRs are defined as minor, significant or major, and the number continues to decrease year on year, while major releases have plateaued at two or three a year. Most releases came from utilities and gas compression, and were

attributed to utilities of non-process hydrocarbons such as diesel or hydraulic and lubricating oil, from systems containing limited quantities of these hydrocarbons. The most frequent equipment types from which releases were reported were valves, piping and flanges.

Personal Injuries and Fatalities

Reportable injuries in the UK are categorised into two types: over-seven-day injuries, and specified injuries and fatalities. In 2017 there were no work-related fatalities in the UK sector. The most common cause of injury was slips, trips and falls on the same level. Compared to with other European offshore sectors (based on the lost time injury frequency data from the International Association of Oil and Gas Producers), the UK remains below the European average.

Operator Safety Performance Benchmarking

Every year, Oil & Gas UK conducts a benchmarking exercise so that installation operators can compare their own safety performance against the industry average. In 2017, 36 installation operators were included. The wide variation in frequency rates between the best and worst performers is affected by the relative size of the company's operations.

Asset Integrity Performance Indicators

The industry's asset integrity Key Performance Indicator scheme uses the data provided by Oil & Gas UK member companies on a voluntary basis at the end of every quarter. KPI-1 measures HCRs, while KPI-2 and -3 measure verification non-compliance and safety-critical maintenance backlog, respectively. The average number of preventative, corrective and deferred safety-critical maintenance man-hours in backlog per installation has decreased steadily since 2015.

Health

Certain diseases, as well as injuries and dangerous occurrences, have to be reported. These are primarily occupational diseases such as Hand Arm Vibration Syndrome or occupational dermatitis; some infectious diseases are also reportable. While the reported cases fluctuate, the average annual number is less than 15. While 2017 saw a marginal increase in the fail rate of examinations, and people over the age of 50 are three times more likely to fail



their examination than those under 30.

Offshore Helicopter Operations

Helicopters are intrinsic to offshore operations. Since 1976, to year-end 2017, more than 68 million passengers have been transported to and from UKCS offshore installations on over 8.1 million flights (or sectors flown), totalling nearly four million flying hours.

During the same period, 13 fatal accidents have claimed the lives of 119 offshore workers and flight crew. There have also been 61 non-fatal accidents. Industry-led initiatives and CAA research projects have brought many safety improvements to UKCS helicopter operations.

Significant Activities

Oil & Gas UK develops industry guidance to promote awareness of sector-specific good practice and regulatory compliance, on such topics as fire and explosion risk management, emergency response and rescue vessel requirements and electrical operations. It also provides a mechanism to communicate pending changes in regulatory approach and/or legislation affecting industry relating to, among others, adverse weather, radioactive substances and occupational exposure limits for benzene.

A key role for Oil & Gas UK is the identification of potential changes to the operating environment arising from legislative and constitutional changes, as the practicalities and implications of the UK exit from the EU are yet to be understood. Monitoring of relevant legislative developments and communication with external stakeholders continues.

2018 Look-Ahead

Hydrocarbon Release Reduction

HSE Energy Division has stated in a letter to all duty holders in the UK that the “oil and gas industry must improve further in this area to reduce the likelihood of an incident with potentially catastrophic consequences”.

In response, Oil & Gas UK is facilitating an industry response to this challenge, to address the three key areas highlighted in the letter: process safety leadership; audit, assurance and review; and how to support sustainable learning from incidents.

Other matters being monitored (via work groups, feedback from stakeholders, and close collaboration with the regulatory authority, service providers, and industry and workforce representatives) include:

- * Maintaining Safe Operations Where the Emergency Rescue and Recovery Vessel is Unavailable to Perform Normal Duties
- * Changes to Benzene Occupational Exposure Limits
- * Review of Cat-A EBS and Medical Fitness
- * Helicopter Operations Safety and Resilience
- * Mental Health

Conclusion:

Health and safety performance in 2017 showed an improvement in many of the key indicators. The report states that is ‘a testament to the effort being made by all those working in the industry.’

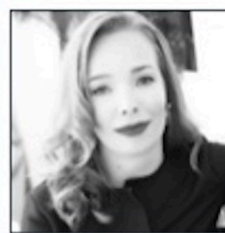
However, it adds that the message from Safety 30 was clear: ‘complacency is a significant risk and we must remain vigilant to the subtle warning signs that remind us of the need to continuously improve. As our industry emerges from a sustained downturn, health and safety remains a core value and is at the heart of all that we do.’



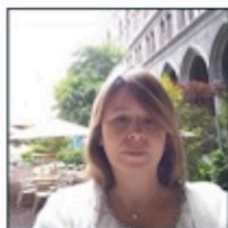
[CLICK HERE FOR LINK TO FULL REPORT](#)

Meet the SPE London Board

SPE is a non-profit professional society with 164,000 members in 143 countries. The SPE London Section, with average 2000 members and seven associated student chapters, is an active section with an aim to connect, engage and promote exchange of knowledge within London energy community of technical and commercial professionals. The SPE London Board is the policy-making and governing body consisting of volunteers who devote their time to oversee many of SPE London's administrative and operating responsibilities.



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Chair



Carolina Coll
Past Chair



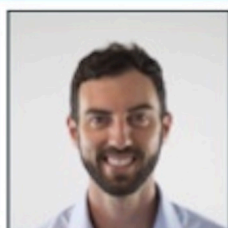
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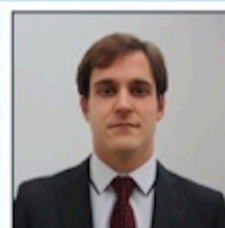
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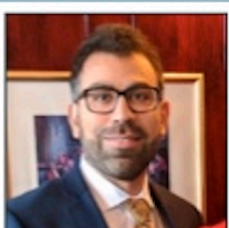
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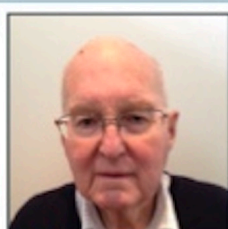
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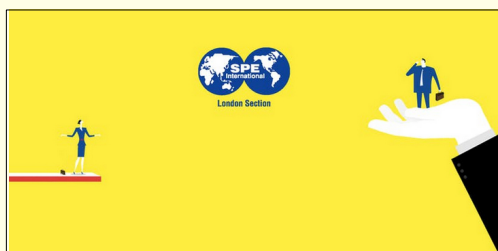
What's happening: Events, videos and jobs

Mark the dates! SPE Conferences in Europe November-December 2018

| | | |
|--------------------|--|---------------------|
| 3 Oct - 2 November | SPE Annual Caspian Technical Conference & Exhibition | Astana, Kazakhstan |
| 5-7 November | Arctic Technology Conference | Houston, Texas, USA |
| 12-15 November | The Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC) | Abu Dhabi, UAE |
| 28-28 November | SPE Middle East Artificial Lift Conference & Exhibition | Manama, Bahrain |
| 10-12 December | SPE Annual Heavy Oil Conference & Exhibition | Kuwait City, Kuwait |

Women in Energy (WiE)

WiE hosts events throughout the year, including the annual one-day seminar, all focused on gender balance in the oil and gas industry.



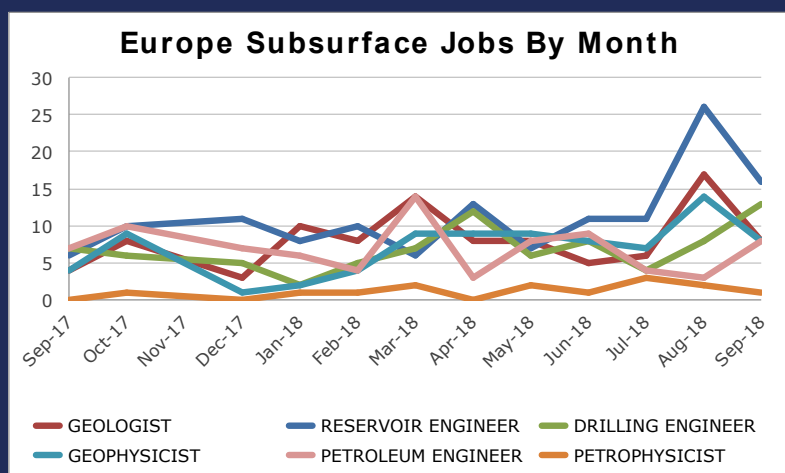
Companies such as BP, Shell, Total and Schlumberger sponsor WIE events, while industry partners/collaborators include UK-based UK POWERful Women and SPE WIE South Central Europe Region.

The annual WiE conference attracts a wide audience with high-profile speakers including senior VPs from Total, VPs from BP, CEO Oil and Gas UK, Shell UK chair .

Here's a taster video of events and opportunities with SPE WiE: [Two-minute SPE WiE video](#)

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