

# SPEREVIEW

The magazine for the Aberdeen and London sections of the Society of Petroleum Engineers

**Drilling Automation:  
Do we need it?**

**Industry invests  
in R&D**

Our near-wellbore focus brings together  
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## 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 110,000 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 publications, events, training courses, and online resources at [www.spe.org](http://www.spe.org)

The SPE provides services through its global events, publications and website at [www.spe.org](http://www.spe.org). SPE review is published 10 times per year by the Aberdeen and London sections of the Society of Petroleum Engineers. It is sent to over 5,000 UK SPE members, and quarterly to an additional 7,000+ European members.

If you have read this issue and would like to join the SPE and receive your own copy of SPE review, as well as many other benefits – or you know a friend or colleague who would like to join – please visit [www.spe.org](http://www.spe.org) for an application form.

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## CHANGE OF ADDRESS?

If you need to change any of your membership details, please visit the **Update your profile** link at the foot of the homepage at [www.spe.org](http://www.spe.org)

# Summer of excitement



Anthony Onukwu  
SPE Aberdeen chair  
2013/14



Arnaud Mille  
SPE London chair  
2013/14

As we head into the summer months, where it has to be said that the differences in temperatures between London and Aberdeen can be significant, it is interesting to note that the closer ties between the two SPE chapters is already reaping rewards.

In Aberdeen, preparations are well under way to mark the 40th anniversary of the section, culminating in a celebratory dinner to be held in August. This is sure to be a gala occasion that will be a highlight of the year for all those who are able to attend.

The London section has been busy, with the Women in Energy conference taking place at the end of May and – by the time you read this – the London Conference and Gala Dinner having taken place and we will be reporting extensively on both of these key events in a future issue.

As part of our commitment to delivering what our readers want to read in SPE Review, we intend to increase our focus on providing insights from experts willing to share their skills and expertise via articles and features. Our intention is to establish closer links with the SPE UK website and social media channels to enable members to maximise the benefits of their membership.

We will continue to report on the events and social side of the SPE in Aberdeen and London, but also want to take a closer look at the wealth of seminars and lectures that take place throughout the year. We also wish to give members greater exposure to the incredible level of knowledge and experience that our speakers are willing to share with their colleagues, peers and – perhaps most importantly – the younger professionals and students who will take the industry into the future.

This month we've taken a close look at drilling automation, ahead of a major conference taking place in Aberdeen later this year and consider what effect it could have on the industry. We've also featured a report from the Simplified Series of lectures held in Aberdeen. It is clear these events are having a positive impact.

Our events need to be seen by as many members as possible and, where applicable, used as a reference for potential research topics, as sources of knowledge and information sharing, or used as peer views.

[www.spe-uk.org](http://www.spe-uk.org) |



# Automation: do we need some too?

Drilling automation may be the solution the oil and gas industry seeks to optimise production and extend the economic lives of brownfield sites, with the potential to completely change the way in which we develop new fields.

A ground-breaking new seminar will examine these issues and look at some of the solutions already used, as well as its future needs. It takes place at the Aberdeen Exhibition and Conference Centre on October 2, 2014.

Over the last decade, the oil and gas industry has developed closed loop systems for optimising ROP and for managed pressure drilling. Advanced mechanisation on the rig floor is now commonplace, providing major improvements in safety, but operational performance has not always met expectations.

Whilst new build rigs can be designed to accommodate these changes, the upgrading of older rigs presents considerable challenges and commissioning delays are commonplace. At this time, standards for constructing these systems are predominantly company-based rather than industry-wide and integrating them remains a challenge.

In the same period, the military and other industries have embraced automation and have made considerable progress, gaining access to hostile environments, removing people from harm's way and segregating tasks in a manner that leverages both robot and human capabilities and strengths.

A well-known success story is the landing, after an eight-month-long journey, of the unmanned Mars Rover Curiosity on the red planet. Its mission is to determine the habitability of Mars and, moving up to 660 ft/day, it carries all the equipment necessary to gather and analyse rock and soil samples and send the results back to mission control on Earth.

The parallels of this story with remote access to facilities and wells are clear. This may be just what is needed to optimise production and

extend the economic lives of our brownfield sites, and it has the potential to completely change the way in which we develop new fields. For example, in the North Sea, platform PoB is a common challenge, so what additional activities and surveillance could be moved onshore? In the last decade we have shown how offshore crew size can be reduced by 40% – in the next decade, will we see a further reduction in crew size?

How might we deploy a robot probe in a subsea well only to be collected 30 days later with the necessary data, or be able to detect and correct for unexpected drilling problems? If we do these things, how will people react? What new skills will be required and what role does legislation have to play?

The seminar will look at the industry's progress to-date and its future needs, comparing these with progress outside the oil and gas industry to provide a window on what is now possible and what may yet be.

It will help delegates to address today's challenges and identify opportunities, success criteria and blockers. The seminar will be supported by the SPE Drilling System Automation Technical Section (DSATS).

To find out more about exhibition and sponsorship opportunities, please contact the organisers, Rodger & Co, at: [www.rodgerandco.com](http://www.rodgerandco.com)

An early bird £50 discount applies until September 4. For further details and the link to book please visit [www.spe-uk.org](http://www.spe-uk.org) or contact [spe@rodgerandco.com](mailto:spe@rodgerandco.com). For group bookings – book four places and get the fifth free. The event has also attracted a new platinum sponsor: Saudi Aramco.







From left to right: Niamh Collins (YP collaborator), Carla Riddell, Neil Leonard, George Yule, Patricia Fleitas, John Sayer (YP PESGB officer), Ken Cruickshank

# YPs hear from industry leaders at **DEVEX 2014**

YP SPE Aberdeen Committee, in collaboration with AFES, PESGB and EI, hosted the Young Professionals event Teamwork – The Greatest Technical Challenge, which took place at DEVEX conference, on May 7. This exciting and insightful event was sponsored by Maersk Oil.

The event was chaired by Ken Cruickshank (operations manager, Oil and Gas UK) and a panel of experts comprising Carla Riddell (subsurface team leader, Centrica Energy), Neil Leonard (HR director, Bibby Offshore) and George Yule (vice chairman, Aberdeen Football Club) who shared their experiences and views about inspiring teams, leadership and effective teamwork.

The panel took the attendees through the event agenda by exploring firstly the type of audience; the majority were identified as subsurface

professionals, in their early career, who see themselves as team leaders in the next 3–5 years. Surprisingly, for the panel, the audience answered that technical challenges, recognition and appreciation were the most important factors to inspire and motivate engineers, rather than high salaries or bonuses, which represented less than 6% of answers. The event continued with a dynamic question and answer session to address three main questions:

**What do you believe is the key to retaining and inspiring staff in a competitive and driven industry?**

The panel and audience concluded that team leaders need to understand the individual requirements of the team members and provide the adequate atmosphere for their development where support,

resources, clear roles and objectives are the keys for team success.

George Yule answered: “People are inspired and retained by success. We, as employers, are looking for people who desire to be successful and this applies to the oil and gas industry, or sport, or business. Motivation needs to be provided by leaders.”

**How would you/do you manage your team to achieve the end goal?**

A combination of clear communication, goals definition and space for developing individuals’ points of view were the main focus of the debate.

“Managing and leadership are different. It is important to manage the team in the same direction to achieve final goals by following the plan, but you are required to know about leadership in order to understand individual skills and team

behaviours,” explained Carla Riddell.

**How would you lead and inspire unity within your team to complete the task?**

An environment that encourages collaboration and discussion, a leader who knows the skills and capabilities of each one, giving time to the team to know each other, respect team diversity and clear roles and responsibilities, were some of the conclusions to this question.

Neil Leonard added: “Good work practices, which are followed by leaders, makes teams learn how to do things correctly, creating good pathways to form new leaders.”

The session concluded with a lunch, photo session with the Scottish League Cup 2014 and interaction between organisers and audience in a relaxed atmosphere.

*Contributed by Patricia Fleitas.*

# Petrophysics simplified

The following is a synopsis of Alan Johnson's presentation for the SPE Aberdeen Simplified Series 2014 Lecture held on May 7, 2014.

Alan is a Principal Petrophysicist in Shell UK Aberdeen. Before joining Shell in 2001, he worked as an independent Petrophysical consultant in the UK for a number of years following a 14-year career with Hamilton Oil (later BHP Petroleum) as a Senior Petrophysicist and Petroleum Engineering Supervisor based in London and Vietnam.

He originally started his career at Shell in 1974, with a degree in Physics from Aberdeen University; during this early phase of his career, he worked in Aberdeen, Abu Dhabi and The Hague, predominantly in Petrophysics.

*"There is a need for a term to express the physics of rocks. It should be related to petrology as much as geophysics is related to geology. 'Petrophysics' is suggested as a term pertaining to the physics of particular rock types whereas geophysics pertains to the physics of larger rock systems comprising the earth"* quote from Gustav Archie from: Introduction to the Petrophysics of Reservoir Rocks – AAPG Bulletin Vol. 34, No 5 (May 1950).

Petrophysics therefore focuses on reservoir rocks at a relatively fine scale. Petrophysicists are interested in the parameters of Lithology/Rock Type; Porosity; Fluid Saturation ( $S_w$  or  $S_h$ ); and Permeability, which, through combined analysis, provide indications of the pore spaces in the rock type where hydrocarbons may be found. Petrophysicists are therefore driven to study the rock, but in reality, most are interested in studying the pores in the rock.

Porosity indicates how much fluid a rock can hold. Almost all oil and gas produced today comes from the accumulations present in pore spaces of reservoir rock. Petrophysicists provide most of the key inputs to formulas

that help determine hydrocarbon in-place volumes via the total target rock volume, the percentage of oil saturation ( $S_h$ ) and percentage of water saturation ( $S_w$ ) included in the total rock volume.

Permeability, which is measured in Darcys, provides information on how well a liquid or gas will flow through a porous rock.


The advances made in the ability to measure and to interpret the data given by Lithology, Porosity and Permeability are at the foundations of petrophysics.

The downhole measurement of Petrophysical data intended to measure and determine the physical properties of the reservoir came to be with the first Wireline Log developed by Schlumberger. It was first put to use in 1927 in France and the initial tool measured formation resistivity.

Major advances in tools for measurements and the physics required for the interpretations of the measurements occurred in the following 20 to 30 years; technological advances in more recent years have been more modest. The basic tool measurements: neutron porosity, sonic travel time, bulk density and induction and conductive resistivity measurements were all developed before 1960. The main advances in more recent years have been in pulsed neutron scattering and capture, wireline formation pressures and nuclear magnetic resonance.

There is still room for research in developing data gathering tools and improvement of the mathematical models used to interpret petrophysical data and in particular in regards to improving permeability prediction, understanding thinly bedded formations and unconventional reservoirs.

*Contributed by George Grangeon.*



# HOT

## Upcoming Training Highlights for E&P Professionals

**Jul 30-Aug 1, 2014 – Vienna, Austria**  
**Basic Petroleum Economics (PBM14)**

**Aug 4-8, 2014 – Istanbul, Turkey**  
**Petroleum Geostatistics - Integrating Data for Reservoir Modelling and Simulation (GG07)**

**Aug 4-8, 2014 – Vienna, Austria**  
**Reservoir Engineering for Non-Reservoir Engineers (RE01)**  
**Modern Project Management (SSM33)**

**Aug 11-15, 2014 – Vienna, Austria**  
**Introduction to Reservoir Characterisation and Modelling (GG26)**  
**Foundations of Petrophysics (PP01)**


**Aug 11-15, 2014 – Istanbul, Turkey**  
**Enhanced Oil Recovery: Fundamentals and Applications (RE31)**

**Aug 11-13, 2014 – Vienna, Austria**  
**Geothermal Drilling Technology (DR13)**

**Aug 11-14, 2014 – Vienna, Austria**  
**Digital Core Analysis (RE40)**

**Aug 18-22, 2014 – Vienna, Austria**  
**Wellsite and Operations Geology (GG13)**  
**Introduction to the Oil & Gas Industry (IC04)**

Register online now at [www.hoteng.com](http://www.hoteng.com)



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# DEVEX donates to charity

DEVEX 2014 attracted more than 350 delegates and saw the event's largest exhibition to-date with a full technical programme delivered by local and international speakers.

The conference, held at Aberdeen Exhibition and Conference Centre on May 6-7, donated £1,000 to Satrosphere Science Centre to support the SPE's Energy4me project. The money donated was in lieu of the usual gifts given to speakers in order to give something back to the local community.

Energy4me aims to engage teachers and local schools with the

oil and gas industry by delivering education direct to the science teaching staff of local primary and secondary schools through CPD sessions delivered at Satrosphere, based in The Tramsheds on Aberdeen's Constitution Street.

Marie Dare, Education Officer, Satrosphere Science Centre said: "We are most grateful to the DEVEX 2014 Committee and speakers for their generous donation; as an educational charity we rely heavily on donations such as this one. Such funding allows us to reach a wider audience and make a real difference within the

community. In the case of the Energy4me project we are able to provide high quality kit and lesson plans to teachers that are curriculum-linked and relevant to their pupils' daily lives."

Chairman of DEVEX 2014, Peter Brand of the Society of Petroleum Engineers, commented: "We chose to donate to Satrosphere as SPE had created the educational materials in the Energy4me project, which Satrosphere have adapted. The concept of informing children about the oil and gas industry fits well with the ethos of DEVEX

– which is all about sharing information and knowledge – so we are very glad to be able to help Satrosphere with their work to inform and stimulate the imagination of local children!"

He continued: "This happy occasion is one of my last duties as chair of DEVEX 2014 as I'll be handing over to Philip Whiteley from the Petroleum Exploration Society of Great Britain (PESGB) shortly and he'll be starting to form the organising committee for DEVEX 2015."



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**SPE ICoTA European Well Intervention Conference**  
12th & 13th November 2014 Aberdeen, Scotland

## Call for Abstracts

The SPE ICoTA European Well Intervention Conference is Europe's premier forum for exchange and discussion of the latest developments in well intervention and completion techniques.

We invite people within the industry to share their knowledge and experiences. Presentations will be welcome on relevant topics such as:

### Intervention Techniques & Technology

- Subsea fields
- Mature fields
- Challenging environments

### Completion Systems

- Advances in technology
- Thru-tubing drilling
- Innovative solutions

### Well Integrity & Abandonment Operations

- New technology and innovative solutions
- Lightweight rig intervention
- Safety innovations

## SUBMITTING ABSTRACTS

An abstract, that is, a 200 word summary of the presentation, should be uploaded on **[www.rodgerandco.com](http://www.rodgerandco.com)** or submitted to:

### SPE ICoTA 2014

Event Organisers  
Rodger and Co  
E: [kate.yuill@rodgerandco.com](mailto:kate.yuill@rodgerandco.com)  
T: +44(0)1224 495051

**Deadline 31st July 2014**



# Aberdeen section launches YouTube channel



SPE Aberdeen has launched its own YouTube channel. During the last 12 months, the way the section communicates and engages with its members has seen a dramatic restructure.

There is a new website, a new look SPE Review and there is now also a co-operation agreement in place with SPE London Section for the cross-advertising of major events.

In an effort to reflect the needs and wants of the SPE Aberdeen members there are regular membership surveys already undertaken and the Communication Working Group is already reacting to members' suggestions and wishes.

Aberdeen is one of the first SPE Sections to launch its own YouTube channel. Aberdeen Section chairman, Anthony Onukwu, said: "We believe that our events need to be seen by as many members as possible and, where

applicable, used as a reference for potential research topics, used as a source of knowledge and information sharing, or used as peer views.

"By having seminars and lectures, such as the Simplified Series, available to view online we can ensure that members will be able to maximise the benefits of their membership. Our events are a fantastic source of learning for petroleum engineers at every stage of their career. The calibre of speakers is consistently high, and by sharing and disseminating the wide array of subject topics, we hope to broaden members' opportunities to learn from industry experts," Mr Onukwu added.

Videos are being added and updated regularly and among the ones available at present are highlights from the recent Another Perspective on Risk panel session and Q&A session and also the SPE Simplified Series, such as the Dana Western Isles Development Project.

## Audience hears more on North Sea EOR activity

The past, present and future of North Sea enhanced oil recovery (EOR) projects were the topics of discussion at the SPE Aberdeen Section dinner in April, held at the Douglas Hotel.

Euan Duncan, discipline lead reservoir engineer for BP in the North Sea, explained to delegates how EOR works and can go on expanding if the conditions are right. Euan provided a brief history of BP's EOR programme in the North Sea with some examples and lessons learned on three projects on Miller, Ula and Magnus.

He also provided a short summary of current projects – Clair Ridge LoSal® EOR and the Schiehallion polymer application – and how they are being taken from research teams to a project.

The third area of focus centred on how BP is trying to create the next phase of EOR projects. The company is using historic lessons learned as it goes about defining the major barriers and enablers. In a mature basin this is not easy and a discussion of how other companies approach the problem could be interesting. This could involve linkage with the DECC Pilot programme.

He also considered the challenges of applying new technology and looked at some of the issues surrounding this, such as project complexity, lack of confidence in the technology and long payback times.

## YP pub quiz

SPE Aberdeen Section Young Professionals is hosting a pub quiz, which is open to all SPE members.

The quiz takes place at the Sportsman's Club, 11 Queens Road, Aberdeen, AB15 4LY, on June 19, from 6.30-10pm. Teams of four will be formed randomly and announced at the venue. Entry costs £5.

For more information contact Oludare Elebiju on [oludare.elebiju@gmail.com](mailto:oludare.elebiju@gmail.com) or visit [www.rodgerandco.com](http://www.rodgerandco.com)

## Aberdeen upcoming events – 2014

### June 16-18

SPE European Artificial Lift Forum  
Pre-conference short course and 2-day conference and exhibition. Exhibition and sponsorship opportunities. Booking for delegates. Details and link to book on: [www.spe-uk.org](http://www.spe-uk.org)

### June 19

SPE YP Pub Quiz. Sportsman's Club, 11 Queens Road, Aberdeen, AB15 4LY. Per persons per team.  
Contact: Oludare Elebiju – [oludare.elebiju@gmail.com](mailto:oludare.elebiju@gmail.com)

### June 25

The impact and potential repercussions of unconventional hydrocarbons in the UK. Presenter: Lawrence Till, Nemein Ltd. Presentation and networking buffet. Aberdeen Douglas Hotel, 43-45 Market Street, Aberdeen AB11 5EL

### October 2

SPE Aberdeen Summit Seminar: Drilling Automation – I need some too? A new seminar to explore how automation can help the oil and gas industry secure its future. Developments from O&G and other industries will be included. Exhibition and sponsorship opportunities available to companies now. Seminar programme coming soon. Details and link to book on: [www.spe-uk.org](http://www.spe-uk.org)

### November 12-13

SPE ICoTA 20th European Well Intervention Conference  
Companies interested in exhibiting contact: [jane.rodger@rodgerandco.com](mailto:jane.rodger@rodgerandco.com)

More information on forthcoming events is available at: [www.spe-uk.org](http://www.spe-uk.org)

# SPE to launch series of technical conferences, workshops and training courses

The Society of Petroleum Engineers and the Offshore Media Group have announced a multi-year, joint partnership to develop a series of SPE technical conferences, workshops, and training courses at Offshore Technology Days, Norway's largest annual energy trade show, with nearly 500 companies exhibiting and up to 30,000 visitors.

Beginning in 2014, SPE and OMG will host a series of technical workshops and training courses at OTD designed to encourage knowledge transfer and provide a platform for discussion on the issues most important to the region.


From 2016, SPE will launch a biennial technical conference alongside the OTD exhibition, focusing on technical knowledge, best practices, new technologies, and specific challenges faced by the North Sea Offshore E&P industry.

Helge Haldorsen, 2015 SPE President, said: "We are pleased to announce our strategic partnership with OMG collaborating on their established OTD event. Building on the excellent work of our local Sections this opportunity will afford local members, as well as those who have business in the area, a platform for sharing knowledge and



expanding their network and skills.

"The Norwegian Continental Shelf (NCS) Version 2.0 is a world-class E&P theatre of operations with truly impressive recovery factors (>50%), with new technology being piloted and implemented (e.g., subsea compression), with more offshore multilateral wells than in the rest of the offshore world combined and with new amazing billion-barrel discoveries being made due to 'new ideas in old places'."

SPE has five member sections in Norway; Stavanger, Bergen, Oslo, Trondheim and Northern Norway, as well as four student chapters, which collectively boast more than 3,000 members. By providing a venue for the dissemination of technology and information related to the E&P industry through the OMG partnership, SPE will continue to fulfil its mission to serve its members in Norway.

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University of Texas at Austin

Call for Abstracts: Deadline 3 October 2014

## Sedimentology of Paralic Reservoirs: Recent Advances and their Applications

18 - 19 May 2015

The Geological Society, Burlington House, Piccadilly, London



Paralic reservoirs record clastic deposition at or close to sea-level. They reflect a range of depositional environments including deltas, shoreline-shelf systems and estuaries and have provided the backbone of production in many mature basins around the world, currently contributing around 30% of global conventional hydrocarbon production. Strata that host these reservoirs are shaped by a wide variety of depositional processes and controls that reflect the upstream supply of sediment and water, the characteristics of the receiving basin, relative sea-level and tectonic setting. Consequently they exhibit much variability in their stratigraphic architecture and sedimentological heterogeneity, which translates into complex reservoir performances that are challenging to predict. However, new research themes have emerged in recent years: contrasts between regressive and transgressive coastlines; along-strike and cross-shelf variability; shoreline trajectory concepts and the impact of autogenic responses during constant forcing. This conference will address these new themes together with developments in established approaches to discuss the current state of knowledge in the exploration and production of paralic reservoirs.

**Themes:**


- Modern studies, numerical & experimental modelling of paralic systems
- Paralic reservoir character & behaviour: imaging, sedimentology, ichnology, architecture & reservoir models
- Classification & role of mixed energies in strike & dip growth of paralic systems
- Tide-generated heterogeneity in paralic reservoirs
- Paralic muds & mudstone reservoirs

**Core Workshop:**  
20-21st May 2015 Core Workshop (Weatherford Labs, East Grinstead)  
We will be holding a 2 day core workshop immediately after the main conference. To keep the range of depositional settings as broad as possible **we would like participants to bring poster presentations of their own core-based sedimentological studies** in addition to the core which will be provided. At this stage please let Martin Wells (Martin.Wells2@uk.bp.com), Boris Kostic (borkostic@badley-ashton.co.uk) and Laura Griffiths (laura.griffiths@geolsoc.org.uk) know if you would be interested in attending with (or without) a poster presentation so that we can assess numbers - likely maximum 40. This should also give you sufficient time to obtain the necessary permissions to share the material.

**Call for Abstracts:**  
Please email paper and poster contributions to [laura.griffiths@geolsoc.org.uk](mailto:laura.griffiths@geolsoc.org.uk) and copy to [Martin.Wells2@uk.bp.com](mailto:Martin.Wells2@uk.bp.com) by Friday 3rd October 2014

For further information please contact: Laura Griffiths  
The Geological Society, Burlington House, Piccadilly, London W1J 0BG.  
T: 020 7432 0980 or email: [laura.griffiths@geolsoc.org.uk](mailto:laura.griffiths@geolsoc.org.uk)

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# Oil & Gas training

## Upcoming courses 2014

**★ Introduction to Oil and Gas E&P Non-Technical Language**  
Aberdeen 30 June  
Stavanger 14 July  
London 16 July

**Introduction to LNG and the Value Chain**  
London 9-10 July

**Reservoir Engineering for Other Disciplines Part 1 & 2**  
Aberdeen 1-2 July  
London 7-8 July  
Stavanger 15-16 July

**Integrated Field Development Planning**  
London 9-11 July

**★ Peer reviewed and approved by the SPE Global Training Committee**

**Petroleum Economics**  
London 1-2 July

**Decision Making in the Upstream Oil and Gas Sector**  
London 3-4 July

**Upstream Oil and Gas Development Lifecycle Costing**  
London 3-4 July



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# Industry looks to invest in more R&D

A survey on technology and innovation has revealed a potential new trend in the oil and gas industry. The technology and innovation survey from Lloyd's Register Energy suggests that spending on research and development by the oil and gas industry will increase by at least 10 per cent in 2015.



Peter Richards

The survey, conducted among more than 250 professionals and executives from the international oil and gas sector, identifies the top three drivers for research and innovation as: improving operational efficiency, improving safety and reducing costs.

However, compensating for talent and skills shortages only ranks as 10th in terms of the drivers.

"When we looked at the data from 100 respondents, compensating for talent and skill shortages was up there in the top three, but now it is 10th," Peter Richards, vice president, marketing & communications, Lloyd's Register Energy, told SPE Review.

"If we had looked at a survey over the last two or three years, skill shortages would have been seen as among the prime concerns for the industry. Our survey is saying that the drivers that the oil and gas industry see for research and innovation are now more around operational efficiency, safety and costs.

"Safety is still key, which is extremely positive, but the other

prime drivers for innovation are being seen more from a cost point of view which may suggest that the industry is on a cusp. I think that the survey is actually supporting what we are starting to see from an industry perspective. "We are now seeing it start to enter more into a phase where operators are having to look at their cost base with a lot more focus to ensure they can continue to capitalise on the opportunities that are out there."

Richards said the research also indicated a greater drive for collaboration in terms of innovation, with more link ups between operators, academia, government-backed research centres, joint-ventures and joint-industry projects, in parallel with a move by some national oil companies – with a research and development background – towards the international oil company business model.

More than 75% of respondents also believed that innovation was speeding up.

Lloyd's Register Energy invited sector professionals, leading academics and industry bodies from 17 countries to comment on

the adoption of key technologies and innovation, the timeline for implementation and the impact technological advancements can have upon safety and efficiency. A total of 20 per cent of respondents were based in the USA and 11 per cent in the UK.

In terms of timelines, the survey divided forecasts into four sections: 2014–2015, 2016–2020, 2020–2025 and beyond 2025. A key focus for technology in the short term is enhanced oil recovery and subsea operations, while further ahead, radio frequency identification, remote sensing, nano technology, wireless monitoring and self-healing materials are expected to come through on a wider scale.

"You are now starting to see more technologies which, if we had talked about them 10 years ago, would have been seen as unlikely," said Richards.

"We are seeing technologies being developed now which are actually starting to address costs within the industry's supply chain.

"One interesting aspect is that the research suggests additive layer manufacturing, or 3D printing, is

currently being seen as [arriving] post 2025 for mainstream adoption, despite it being adopted in other safety-critical industries such as aerospace. Some oil and gas operators are trialling the technology and, as people become more comfortable with it, you might see it drop into the 2016 to 2020 bracket."

The preliminary results from the survey were announced in May and the full findings are expected to be published later this month (June). It is anticipated that the survey will become an annual event.

John Wishart, president of Lloyd's Register Energy, said: "With emission regulations and rising energy costs, the oil and gas sector will benefit from a clearer understanding of the potential innovation scenarios to meet future energy demands and providing robust energy supply.

"The current findings underline that new technology is not a barrier. It is seen as the catalyst for a better performing oil and gas sector and a competitive necessity among the key operators."

# Education programme heads to Houston

This year's annual Offshore Technology Conference in Houston provided a number of opportunities for SPE members from across the globe, including the UK and Europe.

A board meeting of the SPE's Energy4me global educational outreach programme was held during the four-day event at the beginning of May. Energy4me's global educational outreach programme provides speaker programmes and classrooms resources covering all energy sources for teachers to use with students of all ages.

SPE and Energy4me have a range of partners to facilitate greater outreach internationally, including the Satrosphere Science Centre, in Aberdeen, which provides science learning experiences that encourage active involvement in learning with hands-on exhibits, investigative workshops and exciting shows and demonstrations. Satrosphere educators have taken Energy4me lessons and designed a programme for teachers to fit the local curriculum. Energy4me partners with Satrosphere at events in the area, such as Offshore Europe and visiting classrooms for presentations.



As part of the OTC14 Energy Education Institute, OTC hosted 150 Houston-area classroom teachers (grades 4-12) and 200 high school students to attend a free, one-day energy education programme. Attendees received comprehensive, objective information about the scientific concepts of energy and its importance while discovering the world of oil and natural gas exploration and production. The groups participated in hands-on energy lessons provided by the US National Energy

Education Development (NEED) Project, and took a tour of the exhibition floor.

Colin Black, who is a director of SPE Aberdeen, SPE Europe and a committee member of Energy4me, attended the committee meeting in Houston and OTC and was full of praise for the progress that is being made.

"It was a very productive meeting. We set out the objectives for our strategy for the next year. We have embedded Energy4me lessons within the Scottish Curriculum for Excellence, we

have the commitment of science centres such as Satrosphere and we fully expect to develop these centres internationally," he said.

Black, who is vice president of Optima Solutions UK Limited, a TETRA company, added: "It was clear from attending OTC that there is a real buzz and an energy in the market and we saw a range of exciting new technologies on display. Houston is the centre of the international well testing market and the show allowed us to have some good discussions on a global basis."

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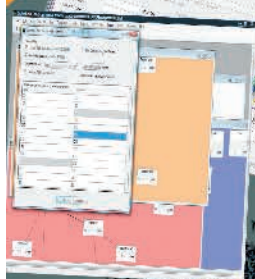
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