

# SPE review

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

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Society of Petroleum Engineers  
Aberdeen and London Sections

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## THIS MONTH

**19th SPE ICoTA Well  
Intervention Conference -  
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**Introduction to Exploration  
and Production - page 12**



**ATCE  
ACCOLADES!**

**SPE President Egbert Imomoh presents SPE Aberdeen Chairman Anthony Onukwu with the President's Award for Excellence and the Section Award for Innovation, at ATCE 2013.**

SPE International's major annual conference and exhibition took place in New Orleans (30 September - 2 October), bringing together more than 12,000 oil and gas professionals from around the world and attracting a record number of 522 exhibitors.

*"It was a terrific event. We were very honoured that SPE Aberdeen activities were highlighted several times by President Imomoh, and that I was asked to participate in a Best Practice panel session to share learnings with other global sections," says Anthony.*

During the conference, the Aberdeen accolades continued with the University of Aberdeen SPE Student Chapter receiving the Outstanding Student Chapter Award, and Chapter member Kahyin Ng being presented with the SPE Star Scholarship for the North Sea Region (see *New Orleans Diary*, page 2).

Next year, ATCE comes to Europe and will be held 27-29 October, in Amsterdam. Matthias Bichsel, Projects and Technology Director for Shell, will serve as ATCE 2014 General Chairperson.

## UNCONVENTIONAL APPROACH

**A lively panel discussion on whether unconventional energy will become a necessary conventional choice was held at the House of Commons in October.**

The annual event, organised by the young professionals of SPE London and the Petroleum Exploration Society of Great Britain (PESGB), encourages young and senior professionals alike to engage on a common topic. This year's focus was on shale gas in the UK, as it has featured prominently in the news during the past year.

*Continued on page 4*



## SPE review

The Society of Petroleum Engineers (SPE), a not-for-profit professional association of 104,000+ members from more than 123 countries worldwide, is a key resource for technical knowledge related to the oil and gas exploration, drilling and production industry.

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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## CONTACTS

**Communications Management Committee:** Jenny Adams, Nick Curum, Elliot Kinch, Ella Minty, Jane Rodger, Pamela Tempone, Diane Wood.

## MOVING ON

Following this issue, SPE review publisher M&M Media will be moving on to pastures new.

M&M Media Partners Judy Mackie and Allan Montgomery would like to thank all advertisers and contributors for their valued support, and wish every success to the new publisher, who will be appointed shortly.

The next issue of SPE review will be published in January 2014. In the meantime, advertising and editorial queries should be addressed to: Diane Wood, Secretary of SPE Aberdeen Board: [dianeasw@aol.com](mailto:dianeasw@aol.com)

## 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).

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## New Orleans Diary...



Shahir, Kahyin and Illia at ATCE 2013

*Students from the University of Aberdeen SPE Student Chapter share their thoughts on the ATCE 2013 experience.*

### 29 September 2013, Sunday

This was one of the best days of my life, *writes Kahyin Ng*. I was honoured to be awarded the SPE Star Scholarship for the North Sea Region during the Student Awards Luncheon. It was also a privilege to applaud our SPE Student Chapter President, Shahir Yousaf, who received the Outstanding Student Chapter Award. This award reflects all the hard work, passion and dedication put in by our committee and the supporting members of our Chapter. I also met a lot of students from all over the world while participating in the ice-breaking games during Student Meet and Greet. Later that evening, we attended a Section Leadership workshop, where we exchanged our experiences, concerns and suggested improvements. Through this, we established good links with other student chapters and have gained advice and ideas to be applied to our own Chapter.

### 30 September 2013, Monday

The highlight for today was the Petrobowl, *Kahyin Ng continues*. This is where student teams representing different student chapters compete in a quiz competition covering topics on the oil and gas industry and the SPE. It was my first time watching an intense quiz game live, with students cheering for their teams. This was a truly educating, yet entertaining, experience. After a whole day of competition, Colorado School of Mines was crowned the winner of 2013 Petrobowl. In between breaks, we went to the exhibition floor and visited several companies to see the latest technologies. I also attended several technical talks related to reservoir engineering, on case histories, enhanced oil recovery and evaluation of unconventional reservoirs.

### 1 October 2013, Tuesday

*Shahir Yousaf writes:* The day started off with a three-hour talk, 'How to write a Technical Paper', by Byron Haynes, of Shell, who also serves as an associate editor for the SPE Reservoir Evaluation & Engineering journal. As my fourth-year university course work requires me to write and present my dissertation, the session provided great tips and tricks for doing so. Now I feel confident to write a technical paper for the SPE and will be able to enter the undergraduate technical paper contest. Later, we explored the great city of New Orleans, visiting the French Quarter, Bourbon Street and listening to jazz.

### 2 October 2013, Wednesday

Today we went for a special health and safety session, *writes Illia Kuznietso*. Andrew Dingee, BP Learning Advisor, shared his experience of the airline industry and described how such experience can help to improve safety in the oil industry. The session defined Plan Continuation Bias/Channelised Behaviour, and provided useful tools that HSE managers can use to reduce these effects and identify the differences in incident reporting programmes between the two industries. This was followed by the President's Luncheon and Annual Meeting of Members. During this prestigious event, SPE President Egbert Imomoh announced the achievements and new initiatives of SPE members. Awards were given out to the best sections and Aberdeen Section won two awards.

**Footnote:** We would like to thank the SPE Aberdeen Section Board for sponsoring us to attend this event. SPE ATCE brings the big SPE family together and being able to attend is really a dream come true. It gave us so much opportunity to learn and network. SPE has done more than we could ask for and we are proud to be a part of the organisation. We look forward to attending next year's event, in Amsterdam!



# TECHNICAL MEETINGS



LONDON



EDINBURGH



ABERDEEN

## London

**'Focus on making decisions...not on searching for and analysing the data'**, is the message **Chris Fair, President of Oilfield Data Services**, has for SPE London members, at this month's evening meeting, on **26 November**, at the **Geological Society Piccadilly**. The meeting is kindly sponsored by **OptaSense**.

Chris will explain the physics involved in wellbore, completion and reservoir modelling and evaluation. He will then review the tools/methods that petroleum engineers have at their disposal to analyse well/reservoir data. Next, he will discuss how many of these methods can be automated and the consequences this has on well/reservoir surveillance and decision making. The talk will conclude with some audience-interactive examples from real well data.

Chris Fair holds a BS in Chemical Engineering and an MS in Petroleum Engineering from the University of Houston. Since 1992, he has worked in various positions in the chemical industry and oil patch. In 1997, he joined Data Retrieval Corporation, where he worked on expanding the range and types of wells that could be effectively tested from the surface, and on increasing the company's markets, both in the US and overseas. In 2005, he and Ricardo Flores started Oilfield Data Services, Inc - a Houston and London-based petroleum engineering software development company that also offers reservoir and production engineering consulting services.

**David Hill, of OptaSense**, will then present **'An introduction to fibre-optic Distributed Acoustic Sensing and its impact on IOR and EOR'**.

Distributed Acoustic Sensing (DAS) is a new sensing technology increasingly being seen as a potential game-changer in a number of downhole applications, including hydraulic fracture profiling, permanent flow assurance and 4D-VSP reservoir imaging. The talk will describe the technology and show examples of how this technology is being used.

David Hill is a QinetiQ Senior Fellow and the Chief Technology Officer at OptaSense. Since jointly founding the company, he has concentrated on developing the uses of DAS technology within the oil and gas industry. David has a BSc (Hons) in Imaging Sciences from the University of Westminster, London, and a PhD in Physics, from the University of Kent.

OptaSense is a wholly-owned company of QinetiQ, a FTSE250 multinational defence technology company. Founded in 2010, with offices also in the US, Canada, UAE and Australia, OptaSense specialised in the development and commercialisation of fibre-optic distributed sensing technology into the oil and gas market, as well as for security and transport.

Following the networking buffet, **Piers Johnson, of OPC**, will discuss **'Advances in pressure transient analysis: de-convolution and its applications'**.

While the presentation will include a brief history of the equipment and techniques used, it will also include an overview of the theory of de-convolution. The objective of the talk is to explain that we left behind the Horner Plot some years ago, and now have some powerful techniques available to us when used correctly.

Piers Johnson, an experienced petroleum engineer, is a past Chairman of SPE London and the founder and MD of Oilfield Production Consultants (OPC) Limited, having previously worked for Flopetrol Johnston Schlumberger as Well Test Supervisor, Location manager and District Sales Engineer (Asia).

OPC is a globally-renowned leader in the provision of professional expertise, management and technical support to the Upstream Exploration and Production sector of the oil and gas industry.

**Before dinner: 5-6.30pm**

**Dinner: 6.30-7.30pm**

**After dinner: 7.30-9pm**

**Booking: [www.katemcmillan.co.uk](http://www.katemcmillan.co.uk); tel: 07736 070066; [katespe@aol.com](mailto:katespe@aol.com)**

**Cost: £34 for SPE/PESGB/EI members, £44 non-members, £19 unemployed members, £5 students booking by Friday 22 November (£19 after).**

## Edinburgh

On **19 November**, at the **Edinburgh Conference Centre, Heriot-Watt University, Riccarton**, Strategy and Change Consultant **Ella Minty**, will address Edinburgh-based members of SPE Aberdeen on **'Leadership - a true perspective'**.

The talk will give participants a realistic analysis of key leadership milestones: understanding the drivers of leadership; perspectives on leadership; psychological traits of a leader; leading by example; motivating others; cultural barriers to leadership; engaging; monitoring and intervening, and 'passing the relay'. For those who wish to discuss real professional examples, 'Chatham House' rules will apply.

Ella Minty is a public relations accredited practitioner specialising in external and internal communication. She has been working in high level/high risk projects in the energy industry for more than 15 years. A published author, conference speaker and moderator, university lecturer, programme mentor and business consultant, Ella has always been fascinated by people, their reactions, their drivers and their agendas.

## Aberdeen

**'Creating novel mathematics to solve operational challenges in the oil and gas sector'** is the intriguing title of SPE Aberdeen's evening presentation, on **27 November**, at the **Douglas Hotel (6.30-8.30pm)**.

The presenter, **Cyrille Mathis**, Chief Scientific Officer and founder of **ThinkTank Maths Ltd**, will explain that the ability to solve problems is not only a function of their underlying scientific difficulties, but is also clearly dependent on the convenient simplifying underlying assumptions that may have been made. Drawing on successful examples from the energy, defence and space sectors, she will show how the use of innovative mathematics can transform the handling of problems or even the problems themselves, bring new insights and provide game-changing solutions.

Dr Mathis has a broad scientific and research background, including Mathematics and Engineering. Edinburgh-based ThinkTank Maths Ltd works across a range of business sectors, producing original operational solutions to individual, hard problems in the field of engineering and immense operational complexity, based on new and innovative mathematics.

**Bookings for Aberdeen and Edinburgh meetings:**

**[www.rodgerandco.com](http://www.rodgerandco.com); tel 01224 495051; [spe@rodgerandco.com](mailto:spe@rodgerandco.com)**

**Further information: [www.spe-uk.org](http://www.spe-uk.org) (Aberdeen Events)**

**The SPE Aberdeen evening programme is kindly sponsored by Statoil.**

## Unconventional Approach

(contd from front page)

During the evening, the political implications of unconventional in the UK were discussed by panel members Sir Robert Smith MP, Professor Mike Stephenson (BGS Technical Director), and Hugh Mackay (CEO, Europa Oil and Gas). The dialogue highlighted the significance of communicating science and engineering to the public and the importance of working with local communities to explain where energy comes from.

The successful event rounded off with an opportunity for panellists and members to interact once again over drinks and canapés, in the House of Commons Churchill Room.

SPE London YP Committee would like to thank Centrica, Hess, BP and Statoil for sponsoring the evening.

**For news of more SPE London events, visit:**  
<http://connect.spe.org/London/events>

Words and pictures by Nick Curum



*"People look at the US and only see the plummeting energy prices. Our market is different and we should not oversell the potential of the resources in the ground."* **Sir Robert Smith MP**

*"On one side of the coin, it was deemed the saviour of Britain; on the other side, people thought we would create underground volcanoes and that Blackpool might subside into the sea."* **Professor Mike Stephenson, BGS**

*"I would argue that 'fracking' is a well-proven technology, as it has been around for almost 60 years."* **Hugh Mackay, Europa Oil and Gas**

## YP London hosts its first-ever Student Paper Contest final



SPE YP London hosted the finals of the first-ever UK Student Paper Contest on 10 October, at the Geological Society, Piccadilly.

The event was attended by professionals and students from Imperial College London and the Universities of Manchester, Leeds and Coventry.

The students presented their final projects to a panel of judges and an audience from a wide range of industry backgrounds.

Marianna Sinakova, SPE YP London committee member, says: *"The new event was a great success. It gave professionals and students a chance to network with colleagues from across the UK, attend interesting presentations, and learn about the cutting-edge research carried out at universities around the country. We hope to build on the success of this event by encouraging more universities to take part next year."*

The London YP committee congratulates UK Student Paper Contest winner, Benjamin Pickles, of Leeds University, who won an automatic entry into the SPE European Student Paper Contest. Good luck, Benjamin!

## No ordinary recruitment event!

SPE YP London's 'Introduction to Management Consulting in Oil and Gas', on 26 September, organised in association with BCG, turned out to be no ordinary recruitment event.

For a start, the meeting - at BCG's London office, in Manchester Square - was held in the very room with the famous balcony that featured on several of The Beatles' album covers. Even if extensive renovations make it unrecognisable, it still apparently attracts a lot of photo requests!

The audience was diverse, including young professionals, postgraduate students and post doctorates, all keen to learn more about management consulting.

BCG Associate Director Philip Whittaker launched the event by summarising his own career (he worked as a drilling engineering for a super-major prior to joining management consulting) and outlining the BCG structure. He stressed the growing trend in the consulting industry to employ technical professionals, as opposed to the previous practice of having mostly business-orientated staff.

Consultant Richard Norton's presentation then gave a deeper insight into management consulting - with an interactive twist half-way through, when attendees were divided into teams to play the role of consultants.

The task was to tackle a recent BCG industry project: to measure 'the client' IOC against other Upstream research and development players.

This session took the form of two exercises: creating a list of companies to analyse, and structuring the criteria for mapping competitors. From being friendly advisers when helping the teams, the BCG consultants turned into exacting clients while listening to the young professionals' presentations.

Afterwards the results were compared to the company's actual solutions and some other analysis tools were shared.

The event was wrapped up with a Q&A session. Summarising what it takes to be a consultant, Principal Eric Oudenot succinctly stated: "Being smart!"





## Another Smoking Success!

### SPE YP Aberdeen BBQ - 26 September 2013

Great enthusiasm and a sold-out event marked the launch of the 2013-14 session for SPE YPs in Aberdeen.

Around 60 young professionals from Aberdeen and Dundee joined senior Section members for a highly-successful social evening and lots of great food, at Revolution Bar, Belmont Street.

The event was led by Ross Taylor, of SPE YP Aberdeen. Ritika Pawar, YP BBQ hostess, says: "Thanks to our Sponsor, **Vallourec**, for the wonderful event. It was a delightful opportunity to spend time with new and familiar faces and to meet all the vivacious SPE members."

YP Committee Chair Nikhil Shindgikar explains: "We have planned a very busy schedule of events for this year and, judging by the enthusiasm demonstrated at the BBQ, I am positive we will be successful in executing these events and adding value to our YP community."



Charlie Aitken

## Sold-out soft skills event 'demystifies' petroleum engineering

SPE YP Aberdeen's 'Simplified Series' 'Stand Up, Speak Up! Advance Your Career, Enhance Your Industry!' was the engaging subject of SPE YP Aberdeen's first soft skills event, on 2 October.

More than 100 YPs gathered at a special session, at the University of Aberdeen, to be inspired by speakers from Thor Holt Ltd - a global business presentation consultancy to the oil and gas industry.

Consultant Charlie Aitken presented a new perspective with the idea that working in the industry is a noble profession: just as those in the medical profession save lives, those in the oil and gas industry ensure the survival of humankind.

Thor Holt, a sought-after business presentation coach and Entrepreneur in Residence at prestigious technical university, Massachusetts Institute of Technology (MIT), shared valuable advice on career progression, revealing strategies for how to stand out among your peers and seek out the wisdom of senior leaders, as well as introducing the key concept of "asking the energetic entrepreneur's question" in every career or business situation.

The event, which included a small workshop, was organised by George Grangeon, YP Aberdeen's 'Simplified Series' leader, and Nazli Lochrie and Nikhil Shindgikar, SPE Aberdeen YP Co-chairs.

**If you would like to volunteer/get involved in forthcoming SPE Aberdeen YP events, please contact Nikhil at: [NShindgikar@slb.com](mailto:NShindgikar@slb.com)**

**Find us on Facebook: SPE Aberdeen Section Young Professionals**



Thor Holt

## 'Team Salford' experiences Offshore Europe 2013

In September, a group from the University of Salford SPE Student Chapter visited Offshore Europe 2013, in Aberdeen, having successfully won, along with the University of Coventry, the SPE London 'Chapter Ticket' to participate in the inaugural SPE YP Europe Petro League competition.

During the exciting event, which saw them competing against their peers from several other universities, 'Team Salford' successfully passed through all the competition rounds to reach the final, where they conceded to a team from the University of Aberdeen and took second place.

Following the competition, the group of 10 Salford students attended various technical sessions at the conference, and also visited a number of industry stands, where they had the opportunity to network with other SPE members and discuss their career progression with HR representatives from a variety of oil and gas companies.



L-r: Salford Student Chapter members Muhammed Salihu (President), Bruce Ofori, Chinedu Ukaeru (Secretary), Joshua Ayinbora (VP), with SPE YP Europe Petro League organisers Nikhil Shindgikar (YP Aberdeen Co-chair) and Wonuola Scott (YP Aberdeen team member)



# COMMITTEES ARE US!

SPE Section Committees provide a valuable contribution to the oil and gas industry in a variety of ways, from mentoring school and university students to providing stimulating opportunities for networking and continuing professional development. Our series concludes with an update on SPE Aberdeen's Another Perspective Committee.

## A wider perspective

Another Perspective (AP) was launched in 2009 as an initiative by a group of SPE Aberdeen volunteers with the aim of 'providing support to current and potential female SPE members such that they are able to achieve their full potential'. A sub-committee was formed to work with the other Section committees in order to fulfil the key objectives of:

- promoting female role models and mentors to those within and entering the oil industry
- developing and encouraging the network of professional women
- promoting the benefits of gender diversity (ie increasing awareness of business drivers for attending women's initiatives).

Maria Trujillo, who chaired Another Perspective until earlier this year, says: "I think that so far we have achieved the objectives established in 2009: we have helped to create a women's network, holding two major seminars - **Women in industry: unleashing the potential of your career**, in 2011, and **The leadership journey: unleashing the potential of your career**, in March this year; we have helped to provide role models to younger members, an example being the Women in STEM events, held at the University of



Aberdeen - and we have also promoted the gender balance initiative within the industry by collaborating with various company networks.

"However, we don't want to be considered a group of women concerned only about women's issues - we are a 'multi-coloured' industry, with different

cultures, backgrounds and levels of experience. Another Perspective, through its development, has realised that we have an even bigger scope and that we can highlight different issues that concern everyone working in the oil and gas sector."

SPE Aberdeen Section Chair Anthony Onukwu agrees: "We have achieved a great deal through Another Perspective. However, we can always do better. We have now reached the point that we need to encompass diversity in its fullest sense - and that is what our new AP Committee is doing at the moment."



Another Perspective has recently been re-launched, under the guidance of new Chair, Ella Minty. Ella, a Strategy and Change Consultant, says: "My own international SPE research has revealed that there are issues the industry avoids talking about. These include: human risk, age, sexism, racism, cultural diversity, change and leadership. On some, we do have a dialogue - but this tends to address the 'should do' without analysing what has initially caused the status quo. Therefore, apart from the gender balance issues which the industry seems to currently proactively address, there are far greater risk areas with respect to the human component of the oil and gas industry worldwide."

Ella explains that the new AP Committee will be the first SPE committee in the world to address these issues and provide a platform of dialogue for the industry: "Our aim is to organise two major, groundbreaking conferences for 2014: **Another Perspective on Risk** and **Another Perspective on 'isms'**. The former will aim to achieve international media coverage and we hope will be a flagship event for SPE worldwide; the latter event will be a two-day conference on current hot topics: ageism, sexism and racism. As we shall hear, there are both managers and staff who have been severely affected by these workplace realities."

She concludes: "SPE members can get involved in these initiatives by talking to us. They can raise their issues with us in confidence and tell us what they would be interested in knowing/learning/ debating!

"AP is about the 'human component' of the industry - it is about people, not job titles. Before anyone is an engineer, he/she is, first and foremost, a human being."

**For more information on Another Perspective, please contact:**  
[ap-aberdeen@spemail.org](mailto:ap-aberdeen@spemail.org)



## A message from SPE Aberdeen's new Communication Working Group

Times are changing and today, without an effective, constant and engaging communication process, no membership organisation can truly declare that it serves the needs of its members and that it listens to them, unless several criteria are fulfilled.

SPE Aberdeen's Communication Committee is facing challenging but exciting times - we are no longer keeping a solid bridge between the volunteers of the Committee and SPE Aberdeen's contractors, but are in the initial steps of making this bridge very fluid.

Both volunteers and contractors have a single goal: that of ensuring a proper dissemination, engagement and dialogue with all SPE Aberdeen's stakeholders - our members, sponsors, partner organisations and the industry as a whole.

The Communication Working Group we have set up recently is starting to achieve its main aim: that of communicating - both internally and externally - in a highly professional and coordinated manner.

We are in the process of changing the website; we are going to ensure that the feedback we request from participants at events organised by SPE Aberdeen is properly followed-up, and that we stay true to the brand identity of SPE International, while keeping our local image; and, last but not least, that we shall have more and more members 'talking' to us via social media. The dialogue needs to start somewhere and we are taking the first steps towards it!





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### Aberdeen, UK 2013 Training Schedule

SEPTEMBER 2013		
Aberdeen, UK	03 - 06 Drig / WO	IADC
Aberdeen, UK	09 - 13 Rotary Drig	IWCF
OCTOBER 2013		
Aberdeen, UK	30 - 04 Rotary Drig	IWCF
Aberdeen, UK	07 - 10 Drig / WO	IADC
NOVEMBER 2013		
Aberdeen, UK	04 - 08 Drig / WO	IADC
Aberdeen, UK	11 - 15 Rotary Drig	IWCF
DECEMBER 2013		
Aberdeen, UK	02 - 06 Rotary Drig	IWCF
Aberdeen, UK	09 - 12 Drig / WO	IADC



## London

### 'Optimised shale resource development: proper placement of wells and hydraulic fracture stages'

**Mark Wilson**, European Oil & Gas Equity Research Analyst with Macquarie Securities Group, summaries the SPE London September presentation by SPE Distinguished Lecturer Usman Ahmed, of Baker Hughes.

The concept of recovering hydrocarbons from shale reservoirs is theoretically not that difficult - the combination of two technologies - horizontal drilling and downhole hydraulic fracturing - has allowed the process to become commonplace in the USA.

The global shale gas resource potential is huge: some 44,400 Tcf of shale gas in place. The Baschenov Shale in Russia was illustrated as being 80 times the (resource) size of the Bakken play in the USA! "No wonder integrated companies are investing in that area of Russia."

However, the development of shale gas can be "not very profitable - you have to watch production and cost". The reason for this stems from the common misconception that shales are homogenous (ie constant in properties), whereas they are in fact highly heterogenic (they vary in properties significantly and sometimes within small areas). Hence, the key question companies must answer is not simply 'How many wells can be drilled or fracs performed?', but, more importantly, 'Where do you place those wells and where do you place those fracs within the well?'

#### The data

A graph showing maximum production rates from individual shale gas wells in the USA, from 1981 onwards, showed first a gradual increase in the number of wells drilled during the late 90s, as lateral well design took over from vertical wells. Then, from the mid-2000s, as fracking was combined, a significant increase in both the number of wells and the maximum production rates was achieved. However, along with the increase in number of wells and more wells with higher maximum production rates, there were also just as many dots on the chart showing recent wells that produced low, or no, gas rates.

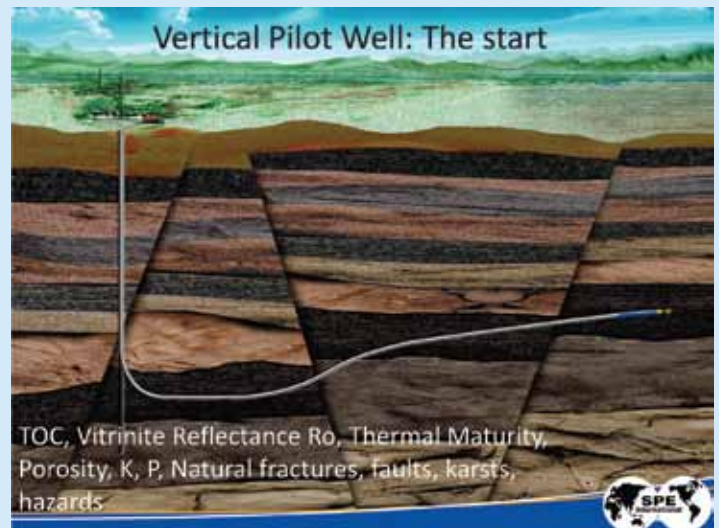
From 2007 to 2011, the average length of the horizontal section has increased from 2,500ft to 4,500ft and the average number of frac stages per well from 14 to 22. The average maximum peak production rate was also shown to have gone up, but still the significant decline in the first six months of a well's producing life was evident. Even with all this progress, it is estimated that 70% of all unconventional wells fail to reach their production targets, 60% of all frac stages are ineffective and 73% of operators say they do not know enough about the subsurface they are dealing with.

#### The goal: maximise return on investment (ROI)

The broad concept of unconventional development is no different from conventional: maximise reservoir contact (of the well) and manage production, in order to maximise overall recovery. However, the important subsurface parameters differ, ie the four key components of a conventional reservoir are porosity, permeability, water saturation and reservoir pressure, whereas the four key components of an unconventional reservoir are: total organic content (TOC), vitrinite reflectance (VR), thermal maturity and reservoir pressure - the one key parameter common to both.

#### Find the sweet spot

Finding locations with an acceptable combination of these key parameters within a shale formation, or any unconventional formation, is the goal to start maximising ROI. However, those reservoir parameters may just satisfy one of three broader categories which must combine to



produce a true sweet spot for production: the geochemical parameters (of TOC, VR, etc) may be acceptable in a certain area, but to find a true sweet spot, we also want the geomechanical parameters (stress regime, fractures, faults, brittleness) and the geological parameters (depth, thickness, etc) to also be ideal.

Sweet spots can also be very localised: analysis has shown that sweet spots are not contiguous. A case study on a five-lateral well development within a small area of the Barnett shale illustrated how, across five horizontal wells, with 10-12 stage fracs in each, 'micro-seismic' showed extremely effective 'rock movement' in the areas around the wells during the frac procedures (ie, good fracs?). However, when production logging tools (PLTs) were run in all five wells, they showed that only the middle three-to-four frac zones in just two of the wells were actually producing the development's gas.

In such scenarios, a traditional view could be to "blame the fracs" (not powerful enough, not the right proppant etc). However, subsequent seismic analysis of the area, combined with log and core data, suggested an extremely localised sweet spot combining high TOC, suitable brittleness, but also - very importantly - the presence of natural fractures in the rock, and that was the area fraced by the 'good' (~25%) fracs.

The pre-drill ability to locate sweet spots suggested TOC could be estimated using 'seismic volume' data and a drilling plan to 'follow the high TOC path' (a Haynesville shale case study was presented). It is virtually impossible to generalise on this, however, due to the "significantly different lithologies across different shale formations/basins". The important takeaway was that cost control up front, ie in the early stages of a shale gas exploration/appraisal/development project, may not be cost-effective in the long run. The logs (all logs - particularly fracture imaging logs and shear wave acoustic logs for stress regimes), the cores, the tests all need to be taken in multiple wells to understand the lithology and the heterogeneity of that lithology as best you can. Then the same process may have to be repeated at more localised areas within a basin.

#### How to place fracs within a well

One main takeaway here is that placing fracs at a constant spacing along a well bore will, according to the overall production data, reduce ROI by being inefficient use of capital versus the production achieved. However, the best places to locate a frac are 'natural fractures zones', which have been shown from cores and/or image logging tools. Fault zones must be avoided at all costs.





## Aberdeen

An unprecedented number of guests attended the first SPE Aberdeen meeting of the session, which focused on Statoil's North Sea Mariner Field.

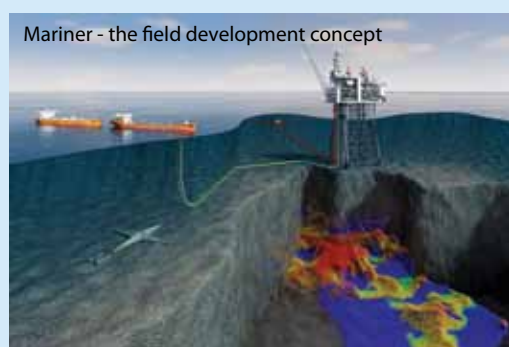
More than 200 oil and gas professionals signed up for the event, keen to find out more about the field which has led Statoil UK Ltd - SPE Aberdeen Evening Programme Sponsor for 2013-14 - to open its new headquarters in the energy capital of Europe.



### 'Mariner Field: a

**challenging UK heavy oil development'**, was jointly presented by Statoil UK Ltd representatives Ingolf Søreide (VP and Mariner Asset Owner Representative), Simone Silcock (Principal Geophysicist) and Ian Thomson (Senior Drilling Engineer). The colleagues presented a rare insight into the project development, discussing in detail the business, reservoir, facilities and drilling aspects.

The Mariner field, discovered in 1981, contains around 1-2 billion barrels of oil and is described as the largest offshore development in the UK in more than a decade. Statoil, which became the operator of the field in 2007, was granted consent to begin the £4.7 billion development in February 2013,



Mariner - the field development concept

and production is expected to begin in 2017. Drilling, production and processing will be performed using a production, drilling and quarters (PDQ) platform.

"Drilling and wells is one of the areas critical to the successful development of Mariner," Ian Thomson explained. "This is mainly due to the large number of reservoir targets and the complexity of the well design. The number of wells to be delivered per year is high. At the same time, we will introduce innovative well solutions to secure water and sand control, and to lift the heavy hydrocarbons up to the process plant."

Commenting on the event, Simone Silcock said: "The sharing of best practices is imperative in our industry, not only to achieve the highest possible levels of efficiency and sustainability, but also, even more importantly, to ensure every person is working as safely as possible."

"Our presentation examined the planned operational activities, as well as the reservoir development strategy, which is based on the re-injection of produced water. We also covered subsurface challenges, including early water breakthrough via the production of heavy oil and the mapping of complex reservoir geometries."

Ingolf Søreide concluded: "We are delighted to support SPE Aberdeen, particularly given the impact that this particular project will have on the local economy and the creation of jobs."

"This was an excellent forum for us to discuss the project and progress so far, and the niche audience allowed us to really delve into the technical details of the Mariner field development."

**You can download a pdf of the Statoil Mariner presentation from the Aberdeen Events Past Presentations section at: [www.spe-uk.org](http://www.spe-uk.org)**

## Strong interest shown in 'new frontiers' Summit Series event

More than 100 delegates attended SPE Aberdeen's October Summit Series Seminar, **'Inwell flow surveillance and control: new frontiers'**, held at the Marcliffe Hotel.

A mix of petroleum and reservoir engineers, asset managers and completions specialists participated in the one-day event, which was kindly sponsored by Aramco Overseas Company (Platinum Sponsor), Zenith Oilfield Technology, and Tendeka.

The Seminar's two main sessions focused on recent advancements in multiphase flow sensors, distributed sensing (fibre-optic) and virtual metering, and on latest-technology ICDs and ICVs, and adaptive inflow control devices that can autonomously react to changes in reservoir flow conditions.

The event, chaired by Steven Fipke (Saudi Aramco), prompted some lively discussion and the packed programme of 14 presentations - launched by keynote speaker Dr Mohamed Noui-Mehidi (Saudi Aramco) - gave participants a valuable overview of the exciting new developments in multiphase flow metering for 'intelligent' wells in onshore and offshore environments.



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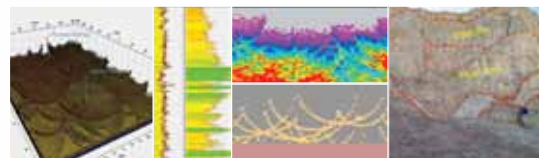


Registration Now Open

## Capturing uncertainty in geomodels: Best practices and pitfalls

11-12 December, 2013

Elphinstone Hall, University of Aberdeen



Over recent years, the static description of hydrocarbon fields has increasingly been undertaken via construction of 3D cellular geomodels. The model builder's toolkit is now extensive, incorporating sophisticated structural framework building capabilities, numerous gridding technologies and an ever-expanding, complex geostatistical data modelling resource. However, as we develop hydrocarbon fields and not the geomodels that are built to describe them, we must ask whether the modelling paradigm is robust and whether the models illuminate or hide uncertainty.

This two-day conference will explore how geomodelling tools should be used to best effect, and when such tools mislead or do not add value. The focus will be on methods and workflows for capturing uncertainty throughout the geomodelling process, and on how to carry this uncertainty into the dynamic modelling realm. Each of four sessions will be headed by a keynote speaker who, together with a further nineteen presenters, will make for a topical and thought-provoking conference. The full programme is available on the conference webpage.

For further information please visit [www.geolsoc.org.uk/geomodelling13](http://www.geolsoc.org.uk/geomodelling13) or contact: Laura Griffiths, The Geological Society, Burlington House, Piccadilly, London W1J 0BG. T: 020 7434 9944 F: 020 7494 0579 E: [laura.griffiths@geolsoc.org.uk](mailto:laura.griffiths@geolsoc.org.uk)



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## THIS MONTH:

**Aberdeen Exhibition & Conference Centre**

Europe's premier forum for exchange and discussion of the latest developments in completion and well intervention techniques. The event, chaired by John Donachie, of Omega Completion Technology Ltd, encompasses the full range of well intervention practices, including coiled tubing, slickline, e-line and hydraulic workover, as well as specialist tools and solutions.

**SPE ICoTA pre-conference short course -  
'An introduction to well intervention'**
**12 November**
**Aberdeen Exhibition & Conference Centre**

Aimed at beginners, non-specialists, or those wanting a refresher, this course - led by trainers from Peak Well Systems and Boots & Coots - will provide a brief introduction to the main types of well intervention in use today. Places are going fast - book now!

**See contact details below.**

## LOOKING AHEAD...

**SPE SMN 6th European Sand  
Management Forum**
**26-27 March 2014**
**Aberdeen Exhibition & Conference Centre**
**CALL FOR ABSTRACTS - DEADLINE 15 NOVEMBER.**

Bookings for exhibition stands and sponsorship invited now - contact [jane.mcclure@rodgerandco.com](mailto:jane.mcclure@rodgerandco.com)

**SPE EuALF 2014 European Artificial  
Lift Forum**
**17-18 June 2014**
**CALL FOR ABSTRACTS - DEADLINE 16 DECEMBER**

EuALF 2014 Chair: John Blanksby, of Enquest  
Bookings for exhibition and sponsorship invited now - contact [jane.mcclure@rodgerandco.com](mailto:jane.mcclure@rodgerandco.com)

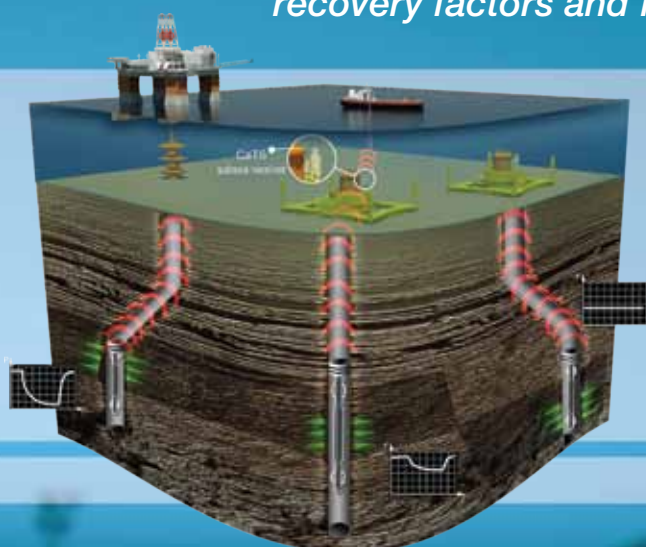
 Details of all the above: [www.spe-uk.org](http://www.spe-uk.org)

 To book: [www.rodgerandco.com](http://www.rodgerandco.com)

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London Section

## Continuing Education Seminars not to be missed

BOOK NOW

### Beyond the Tip of West Africa Iceberg

12 February 2014 Geological Society - London, UK

The West Africa oil and gas exploration zone is one of the world's richest and most promising for ventures and new opportunities in the upstream market, there is a large list of Oil companies that have already made some big discoveries in the region, and this list keep growing faster with new players.

**Beyond the Tip of West Africa Iceberg** is one-day seminar which presents onshore and offshore case studies in the zone, providing to attendees practical learning about E&P, West Africa New Business, Political and Risk Analysis, Business Development, Upstream, International Exploration and Oil & Gas Technology.

This conference will provide an unparalleled opportunity to:

- ◆ Network and find out from West Africa industry representatives, what are the key factors of West Africa oil and gas operation.
- ◆ Be the first to hear latest news from the speaking organisations already present in the region.
- ◆ Learn more about offshore/onshore West Africa operations, what are the risks and what are the main challenges to overcome.
- ◆ Find out which countries in this region present the best opportunities for discoveries.
- ◆ Learn about the latest technology advancements in the region.

we are still open for speakers  
and sponsors opportunities



21st November 2013 Royal Geographical Society - London, UK



**Introduction to Exploration & Production** is a one day seminar taking place at the Royal Geographical Society. The seminar is aimed at people working in the E&P environment, who are new to the industry and/or would benefit from a basic understanding of exploration and production processes and the key elements that make up oil and gas projects.

Attendees will attend a series of presentations by industry and academic specialists covering the subsurface petroleum geoscience and engineering disciplines. Presentations will be at a basic level and attendees will develop a good overall view across all upstream disciplines.

#### KEYNOTE SPEAKERS:

- ▶ Cristian Masini - Dong Energy
- ▶ Michael Ala - Imperial College
- ▶ James Cheeseman - Tullow Oil
- ▶ Rob Leveridge - Schlumberger
- ▶ Jim Aytton - OGC
- ▶ Lance Robinson
- ▶ Geof Boyd - Antium
- ▶ Gianni Morale - Xodus Group
- ▶ Ashley Horobin - Sigma Commercial Consulting

This event is kindly sponsored by: **Schlumberger** and **OGC**



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London Section

## A date for your diary: 'An evening with Lord Browne'

This inaugural event will be a flagship evening for the SPE London Section and provide excellent networking opportunities for members, guests and VIPs.

BOOK NOW



Lord Browne will discuss his career in the oil and gas industry, the transformation of BP under his leadership, the role of the fossil fuel industry in the 21st century and the part that petroleum engineers will play in the transformation of our energy system.

**Where:** The Royal Institution of Great Britain,  
21 Albemarle Street, London W1S 4BS

**When:** 2 December 2013

**Time:** Doors open 6pm for 6.45pm start until 9.00pm

**Tickets:** Members: £20; non-members £40; includes drinks and canapés. Places are limited.

**Booking:** [www.katemcmillan.co.uk](http://www.katemcmillan.co.uk),  
tel: 07736 070066, [katespe@aol.com](mailto:katespe@aol.com)

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## FORTHCOMING EVENTS

### LONDON

- 26 November (5-9pm) (Before dinner): 'Real-time petroleum engineering calculations enable real-time decisions', Chris Fair (Oilfield Data Services); 'An introduction to fibre-optic Distributed Acoustic Sensing and its impact on IOR and EOR', David Hill (OptaSense); (After dinner): 'Advances in pressure transient analysis: de-convolution and its applications', Piers Johnson (OPC)  
VENUE: Geological Society, Piccadilly, London
- 21 November: 9th Annual Introduction to Exploration & Production Seminar  
VENUE: Royal Geographical Society, 1 Kensington Gore, London
- 2 December: 'An evening with Lord Browne'  
VENUE: The Royal Institution of Great Britain, 21 Albemarle Street, London

For details of all SPE London events, visit: [www.katemcmillan.co.uk](http://www.katemcmillan.co.uk) and <http://london.spe.org> If you would like to sponsor an SPE London event, please email [colin.david@akersolutions.com](mailto:colin.david@akersolutions.com)

### EDINBURGH

- 19 November: 'Leadership - a true perspective', Ella Minty (Strategy and Change Consultant)  
VENUE: Edinburgh Conference Centre, Heriot-Watt University, Riccarton

### ABERDEEN

- 27 November: 'Creating novel mathematics to solve operational challenges in the oil and gas sector', Cyrille Mathis, (ThinkTank Maths Ltd)  
VENUE: 6.30pm Douglas Hotel, Market Street, Aberdeen
- 13-14 November: SPE ICoTA 19th European Well Intervention Conference  
VENUE: Aberdeen Exhibition & Conference Centre.

For details of SPE Aberdeen and Edinburgh events, please visit: [www.spe-uk.org/AberdeenEvents](http://www.spe-uk.org/AberdeenEvents), or contact Rodger and Co: [spe@rodgerandco.com](mailto:spe@rodgerandco.com); [www.rodgerandco.com](http://www.rodgerandco.com)



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Call for Abstracts - 29 November 2013

# Geometry and Growth of Normal Faults

23 -25 June 2014

The Geological Society, Burlington House, Piccadilly, London



The past few decades have seen major advances in our understanding of many aspects of the kinematics of normal fault systems. The analysis of high quality 3D seismic datasets of faulted volumes and detailed outcrop studies, combined with complementary geomechanical modelling, have provided much improved constraints on both the nature and growth of faults and associated fault zones. Recent research progress has benefited from the importance of faulting in a variety of application areas, such as the groundwater, minerals and petroleum industries. In a conference convened on the 25th anniversary of the Geological Society's 1989 'Geometry of Normal Faults' conference, it is intended that the full range of technical issues associated with the growth of normal faults, together with their practical applications, will be covered. The conference is in memory of Juan Watterson, one of the pre-eminent scientists in the field of 3-D fault analysis and modelling.

Contributions are invited on all aspects of normal faults including:

- 3D geometry and kinematics of normal faults
- Internal structure and growth of fault zones
- Deformation within the volume surrounding normal faults
- Fault growth on earthquake through to geological time scales
- Links between the ductile and brittle expression of faults
- Stress- and strain-based methods for analyzing normal fault systems
- Numerical modelling of the geometry and growth of normal fault systems
- Practical application of fault analysis techniques

Confirmed Invited Speakers:

Joe Cartwright - University of Oxford  
David Ferrill - Southwest Research Institute, Texas  
Haakon Fossen - University of Bergen  
James Jackson - University of Cambridge

Andy Nicol - GNS Science, Wellington  
David Sanderson - University of Southampton  
Janos Urai - RWTH Aachen University  
Scott Wilkins - Anadarko

A fieldtrip to the Bristol Channel will follow the meeting (26th-27th June).

Instructions for abstract submission are provided on the conference page of the Geological Society website: [www.geolsoc.org.uk/Geometry-and-Growth-of-Normal-Faults](http://www.geolsoc.org.uk/Geometry-and-Growth-of-Normal-Faults). Abstracts should be sent to [laura.griffiths@geolsoc.org.uk](mailto:laura.griffiths@geolsoc.org.uk) and copied to [conrad.childs@ucd.ie](mailto:conrad.childs@ucd.ie) by 29 November.

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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Glencore UK Ltd, part of GlencoreXstrata, is based in the heart of London's West End. It is the headquarters of the group's oil business and trades various products including oil and gas and also has upstream investments in oil production.

Since setting up our E&P business, we have developed a portfolio of exploration, development and production assets. Presently these are focussed in West Africa (Equatorial Guinea, Cameroon and Chad) but with significant on-going new venture activities in other regions. With growing production, we have now taken our first operated licenses and have on-going appraisal operations which will lead to our first operated development. To support this growth, we are looking to enhance our London team with the following skill sets:

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- Senior Completions Engineer
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To find out more about joining a business that has consistently made the right calls and judgements when faced with big strategic E&P decisions, please contact Liz Gardner at our retained consultants, Simpson Crowden LLP on +44 (0)7801 711372 or +44 (0)207 016 9768. To apply, please email your CV to [gardner@simpsoncrowden.com](mailto:gardner@simpsoncrowden.com)

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The Well Engineering and Operations accelerated training program is the most complete and extensive program available to the industry. It covers all aspects of well design and execution including: well planning, casing & drillstring design, cementing and mud technology, hydraulics, wellbore stability, wellheads and Xmas trees, well completion, well control and management of wellsite operations.

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**Entrac Petroleum**

To discuss this program and find out more details, please contact us on:

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