Conference Preview

UGAS

SPE Middle East Unconventional Gas Conference and Exhibition

23–25 January 2012

Abu Dhabi UAE

Unlocking Unconventional Gas: New Energy in the Middle East

SPE International

Society of Petroleum Engineers

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Abdul Nabi Mukhtar
BAPCO
(Conference Co-Chairman)

Hilal Al-Busidy
Petroleum Development Oman
(Conference Co-Chairman)

Saleh Al-Ruwaili
Saudi Aramco
(Conference Co-Chairman)

Dear Industry Colleague,

With the theme "Unlocking Unconventional Gas: New Energy in the Middle East", the 2012 SPE Middle East Unconventional Gas Conference and Exhibition (UGAS) will take place 23–25 January 2012 at the Beach Rotana Hotel, Abu Dhabi, UAE.

The vast success of the previous SPE unconventional gas events in the region highlights the strong interest of such a topic to the industry. The continuous search for improvements in technology and relentless pursuit of cost and operating efficiencies has resulted in the transformation of previously overlooked uneconomic resources, such as tight gas, coalbed methane, and gas shales, into much more economical gas production sources. Technology and means of cost reduction are just some of the topics which need to be addressed on an ongoing basis and an event such as UGAS is the perfect opportunity to do so.

The conference aims to cover unconventional gas in a comprehensive manner through various technical presentations. Topics such as exploration and appraisal; drilling and completion; formation evaluation and petrophysics of tight sand; development and production; stimulation; shale gas; case studies; and technology challenges and emerging solutions, and much more will be covered during technical sessions. Panel sessions will discuss setting the scene, unconventional gas development challenges, and unconventional gas expertise.

We encourage you not to miss out on this outstanding event and look forward to welcoming you to UGAS and Abu Dhabi.

Regards,

Abdul Nabi Mukhtar
BAPCO
(Conference Co-Chairman)

Hilal Al-Busidy
Petroleum Development Oman
(Conference Co-Chairman)

Saleh Al-Ruwaili
Saudi Aramco
(Conference Co-Chairman)

Updates after 17 November will be reflected in the onsite conference programme.

Programme Committee

Abdul Nabi Mukhtar, Co-Chairman, BAPCO
Hilal Al-Busidy, Co-Chairman,
Petroleum Development Oman
Saleh Al-Ruwaili, Co-Chairman, Saudi Aramco

Ahmed Al-Shueili, BP Oman
Badar Al-Abri, Petroleum Development Oman
Bob Dickenson, Packers Plus
Christopher Fredd, Schlumberger
Daniel Kalinin, Schlumberger
Hans-Christian Freitag, Baker Hughes
Keith Parry, Weatherford
Kevin Meyer, ExxonMobil
Martin Jagger, Shell
Michael Bittar, Halliburton
Mike Hopkins, Halliburton
Tareq Al-Shabibi, ADCO
Vincent Flores, VAM Drilling
Wael El-Mofty, Packers Plus

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SPE is the industry-acknowledged information source for books and technical journals composed of member-generated content and peer-reviewed papers. SPE's website provides an immediate, global connection through its vast online library, distance learning courses, membership information, and online communities. SPE has seven offices worldwide located in Calgary, Dallas, Dubai, Houston, Kuala Lumpur, London, and Moscow. For more information, visit our website at www.spe.org.

Updates after 17 November will be reflected in the onsite conference programme.

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Updates after 17 November will be reflected in the onsite conference programme.

Schedule of Events

Sunday, 22 January 2012		
0745–1645 hours	SPE Workshop–Development of Sour Fields: Addressing Business and Technology Challenges	
0830–1730 hours	One-Day Training Course: Shale Gas Primer	
1600–1800 hours	Conference Registration and Speaker Check–In	
1700–1800 hours	Networking Hour for Workshop	

Monday, 23 January 2012		
0730–1700 hours	Registration and Speaker Check–In	
0800–1645 hours	SPE Workshop–Development of Sour Fields: Addressing Business and Technology Challenges	
0900–1030 hours	Opening and Keynote Speaker Address Followed by Tour of Exhibition	
1000–1730 hours	Exhibition	
1030–1100 hours	Coffee Break/Poster Session	
1100–1230 hours	**Panel Session 1: Setting The Scene**	
1230–1330 hours	Luncheon	
1330–1500 hours	**Session 1: Exploration and Appraisal**	**Session 2: Drilling and Completion**
1500–1530 hours	Coffee Break/Poster Session	
1530–1700 hours	**Session 3: Formation Evaluation and Petrophysics of Tight Sand I**	**Session 4: Development and Production I**
1900–2100 hours	UGAS and Sour Gas Gala Dinner	

Tuesday, 24 January 2012		
0900–1730 hours	Registration and Speaker Check–In	
0900–1030 hours	**Session 5: Formation Evaluation and Petrophysics of Tight Sand II**	**Session 6: Development and Production II**
0930–1730 hours	Exhibition	
1030–1100 hours	Coffee Break/Poster Session	
1100–1230 hours	**Panel Session 2: Unconventional Gas Development Challenges**	
1230–1330 hours	Luncheon	
1330–1500 hours	**Session 7: Stimulation I**	**Session 8: Shale Gas I**
1500–1530 hours	Coffee Break/Poster Session	
1530–1700 hours	**Session 9: Stimulation II**	**Session 10: Shale Gas II**

Wednesday, 25 January 2012		
0900–1030 hours	**Session 11: Stimulation III**	**Session 12: Case Studies I**
0930–1530 hours	Exhibition	
1030–1100 hours	Coffee Break/Poster Session	
1100–1230 hours	**Session 13: Stimulation IV**	**Session 14: Case Studies II**
1230–1330 hours	Luncheon	
1330–1500 hours	**Session 15: Technology Challenges**	
1500–1630 hours	**Panel Session 3: Unconventional Gas Expertise**	
1630–1700 hours	Concluding Remarks and Raffle Prize Draw	

Updates after 17 November will be reflected in the onsite conference programme.

One-Day Training Course: Shale Gas Primer
Sunday, 22 January 2012, 0830–1730 hours

Course Description

Geology, Geochemistry, and Petrophysics: Reserve estimation, hydraulic fracturing optimisation, and well productivity in "organic shale reservoirs" depends upon an accurate "shale" petrophysical evaluation. This course describes various depositional environments of shale reservoirs, factors affecting organic preservation, kerogen and its maturation, effect of clay mineral diagenesis on stresses, and generation of natural fractures. The shale petrophysical evaluation includes obtaining accurate mineralogy, porosity, hydrocarbon and kerogen volume estimates, along with mechanical rock properties. This section of the course will give brief overview of the key elements of performing a shale petrophysical evaluation from downhole measurements supplemented with uphole sample based techniques such as TOC analysis, X-ray diffraction, adsorbed/canister gas, vitrinite reflectance, detailed core and thin-section descriptions, porosity, permeability, fluid saturation, and optical and electron microscopy. It will define prospective shale reservoir and give a basic idea about what information needs to be acquired.

Geomechanics and Reservoir Stimulation: This part of the course will highlight the importance of geomechanics modelling and reservoir characterisation to the commercial success of exploiting unconventional gas reservoirs. The nature of shale gas reservoirs is complex and gas production is only possible after hydraulic fracturing of the reservoir. Gas shale reservoirs are challenging because of the variability of their depositional environment, age, mineralogy, maturity, temperature and pressure, depth of burial, fracture characteristics, and in-situ state of stress. In order to accurately predict the mechanical behaviour of the rock during drilling, stimulation, and production, geomechanics modelling is an important part of the integrated formation evaluation approach. The foundation is a geomechanical earth model (GEM), which consists of detailed rock property, pressure, and stress profiling of the overburden and reservoir. Constraining the GEM spatially and knowing how it varies in unconventional reservoir plays provides valuable information to accurately interpret hydraulic fracturing efficiency and microseismic response to hydraulic stimulation. In this respect natural fracture characterisation is critical for construction of fracture models for stimulation and flow simulation.

Drilling and Completions: Organic shale reservoirs are predominantly completed with horizontal wells. This section of the course will give a brief overview of the techniques that are being employed today to build the curve and steer the lateral. The selection of the appropriate lateral landing point is primarily driven by geomechanical parameters. These parameters can be separated into near-wellbore and far field regions. Parameters in the near-wellbore region will influence hydraulic fracture initiation. The far field parameters will control the dimensions of the created fracture system. The measurements required to quantify these parameters will be reviewed as well as the utilisation of these measurements for appropriate lateral placement and completion design. Lastly, a workflow for designing the appropriate completion system will be reviewed. Open-hole and cased-hole systems will be compared and contrasted, completion techniques such as "zipper fracs" will be reviewed, and means of sizing the stimulation treatments from a fluid volume and fracture conductivity perspective will be reviewed.

Well Performance and Reserves: This part of the course will highlight the importance of integrating reservoir geomechanics with reservoir characterisation and formation evaluation to the commercial success of exploiting unconventional gas reservoirs. Since shale gas reservoirs are complex and gas production is only possible after hydraulic fracturing the reservoir and stimulating the pre-existing population of natural fractures and faults, understanding of the present day in-situ stress field and the mechanical behaviour of the rock is key. The foundation for this integrated analysis is provided by a geomechanical earth model (GEM), which consists of detailed rock property, pore pressure, and stress profiling of the overburden and reservoir. Constraining the GEM and understanding how it varies spatially, as well as during stimulation (inducing poroelastic effects) provides valuable information to accurately interpret hydraulic fracturing efficiency, microseismic response–namely, seismic and aseismic slip behaviour of natural fractures–and map the stimulated volume, which is a key input for reservoir simulation and decline curve forecasting.

Agenda

Geology, Petrophysics, and Geochemical: Rick Lewis, Schlumberger Oilfield Services

a. Geology/geochemistry of organic shale reservoirs
    1. Depositional model
    2. Kerogen and its maturation
    3. Clay mineral diagenesis and relationship to stress
b. Petrophysics of organic shale reservoirs
    1. Reconnaissance using triple/quad combo logs
    2. Evaluation using geochemical/NMR logs
    3. Core integration
c. Definition of a prospective shale reservoir

Geomechanics and Reservoir Stimulation: Mark Zoback, Stanford University and Baker Hughes

a. The importance of stress, fracture, and rock properties
b. The mechanics of seismic and aseismic fault slip
c. Modelling poroelastic effects during simulation and the stimulated reservoir volume

Drilling and Completions: George Waters, Schlumberger

a. Anisotropic stress profiling calibration of log derived stress profiles
b. Lateral landing point selection
c. Construction of the lateral: muds, bits, and tools
d. Lateral measurements for well placement in shales
e. Near-wellbore anisotropic stresses
f. Horizontal well completion design

Well Performance and Reserves: Mike Mayerhofer, Pinnacle–A Halliburton Service

a. Understanding created fracture systems with microseismic fracture mapping
b. Stimulated reservoir volume (SRV) and well performance–concept and examples
c. Influence of fracture network parameters on well production, drainage area, and reserves
d. Barnett shale case study
e. Marcellus shale case study

Instructors

Rick Lewis is the shale petrophysics technical manager for Schlumberger Oilfield Services in Oklahoma City. Rick was a developer of the gas shale evaluation workflow that was initially fielded eight years ago and has been applied to well more than 1,000 wells in North America. In his current position, Rick manages a group responsible for the continual improvement for this workflow, and for its introduction and application to the international market. He is also the interface to the Schlumberger research and engineering groups for the development of evaluation technologies for organic shales. Prior to this assignment, Rick was responsible for wireline interpretation development for the central and eastern United States. Rick has also worked for Shell Oil and the U.S. Geological Survey. He received a BS degree from UCLA and MS and PhD degrees from Cal Tech, all in geology.

Mark Zoback is the Benjamin M. Page Professor of Geophysics at Stanford University and a senior executive adviser to Baker Hughes. Mark Zoback conducts research on in-situ stress, fault mechanics, and reservoir geomechanics. He was one of the principal investigators of the SAFOD project in which a scientific research well was successfully drilled through the San Andreas Fault at seismogenic depth. He is the author of a textbook entitled Reservoir Geomechanics published in 2007 by Cambridge University Press. He is the author/co-author of 300 technical papers and holds five patents. He was the co-founder of GeoMechanics International in 1996, where he was Chairman of the Board until 2008. He currently serves on the National Academy of Energy committee investigating the Deepwater Horizon accident and the Secretary of

Energy's committee on shale gas development and environmental protection. Mark Zoback has received a number of awards and honours, including the 2006 Emil Wiechert Medal of the German Geophysical Society and the 2008 Walter H. Bucher Medal of the American Geophysical Union. In 2011, he was elected to the National Academy of Engineering.

George Waters is the shale completions technical manager for Schlumberger in Oklahoma City, Oklahoma. He joined Dowell Schlumberger in 1985 and has held numerous completion engineering assignments starting in 1992, focusing primarily on low permeability hydraulic fracturing optimisation. Since 2000 he has concentrated on evaluation and completion of shale gas reservoirs, including horizontal wells. He is currently involved with the geomechanical evaluation and completion design of organic shale reservoirs under exploration outside of North America. He holds a BS in Petroleum Engineering from West Virginia University, a MS in Environmental Engineering from Oklahoma State University, and a MS in Petroleum Engineering from Institut Francais du Petrole. He was a SPE Distinguished Lecturer (2009–2010) on the topic of completion of organic shale reservoirs.

Mike Mayerhofer is the director of the fracturing centre of excellence at Pinnacle at Halliburton Service in Houston. He leads a team of engineers providing advanced fracture engineering solutions with special emphasis on unconventional shale and tight gas plays. His responsibilities include the application of tiltmeter and microseismic hydraulic fracture mapping results for optimising fracture completion, well placement and infill drilling strategies, the design and evaluation of hydraulic fracturing treatments, reservoir engineering, and integrated field studies. His eighteen-year involvement with hydraulic fracturing and reservoir engineering includes fundamental research and real-field applications in various global producing areas and has resulted in over 50 technical papers and journal articles. Prior to joining Pinnacle in 1997, he worked for Union Pacific Resources in Fort Worth. He has a Doctorate in Petroleum Engineering from Mining University Leoben in Austria. He was a member of the SPE Well Completions Committee from 1998 to 2001 and served on the JPT Editorial Committee. He was the recipient of the 2009 Completions Optimisation and Technology Award for the SPE Gulf Coast North America Region.

For more information or to register for the training course,
please visit www.spe.org/training/courses/UGAS or contact Aswathy Prathap at aprathap@spe.org.

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Monday, 23 January 2012, 0900–1030 hours
Opening Ceremony

Opening Remarks by:

- Abdullah A. Naim, Vice President Exploration, Saudi Aramco
- Graeme Smith, Shell
- Invited Speaker

Monday, 23 January 2012, 1100–1300 hours
Panel Session 1: Setting the Scene

Moderators: George Waters, Schlumberger; Mike Hopkins, Halliburton

The difference between unconventional gas–which includes shale gas, CBM, and tight gas sands–and conventional gas is not the gas itself (which is the same), but the way it is trapped in the rock. It requires different, unconventional approaches to extract it. The main emphasis in conventional gas production is on geological exploration since you need to first find the field and then start developing it. Developing unconventional gas reserves however, focuses on the ways to produce gas rather than finding where it is. When gas is trapped in tight rock, a coal bed, or in shale it makes gas production difficult. Developing such resources requires extensive stimulation to improve gas flow and a large number of wells which usually produce at much lower rates than traditional ones. Such projects are lengthy and their development can sometimes take several decades.

With less and less “easy oil and gas”, unconventional gas holds the potential to help meet the regions rapidly growing energy demand. Potentially recoverable unconventional gas volumes make the bulk of the world’s total gas reserves, and so far the largest developed volumes are located in North America and Asia. Unconventional gas is commonly regionally pervasive–widely spread throughout huge areas–so most probably you know the resources are there, but because of their low productivity you will need many wells, hundreds if not thousands of them, to develop an unconventional gas block, making doing it economically a huge challenge.

To unlock this resource base we need favourable gas prices, technologies that work, and more importantly, the know-how to apply the right technology mix to make the production of unconventional gas economically viable. Furthermore, we need to leverage expertise and proven experience from North America, to assess and unlock the potentially large unconventional gas resources that exist within our region. State support is an essential condition to attract investors to unconventional gas projects. For example, the success of unconventional gas development projects in the US was achieved through tax and price incentives created by the government. Poland is currently regarded as an attractive area because of its low corporate tax rates (19%) and royalties (<1%). Germany has created incentives for the production of unconventional gas. The MENA region would also have to move in the same direction because unconventional gas development projects, due to their lower cost-effectiveness, require a more favourable taxation environment. At the same time, with the right approach and appropriate incentives on the part of the government, unconventional gas projects may become interesting for world-class investors with considerable technological and financial capabilities.

This session aims to set the scene for the conference by establishing the fundamentals components of a successful unconventional gas business, both technical and non-technical. We will explore the need for unconventional gas as an emerging part of the regions energy mix and address how experience from North America and elsewhere can be leveraged to reach sustainable commercial developments.

Panelists:

- David Khemakhem, ExxonMobil Upstream Research Company
- Ismail Buhidma, Saudi Aramco
- Paul Day, Petrowell
- Tauseff Salma, Baker Hughes

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Monday, 23 January, 1330–1500 hours Session 1: Exploration and Appraisal	
Session Chairpersons: **Abdul Nabi Mukhtar**, BAPCO; **Hans-Christian Freitag**, Baker Hughes	
152455	An Effective Approach to Unconventional Resource Exploration in the Middle East A.M. Bouhlel, I. Bryant, Schlumberger
152496	Lessons Learnt from Developing New Gas Resources North West of Saudi Arabia A.M. Albaqawi, A.M. Al Nutaifi, Saudi Aramco
153681	Shale Exploration Methodology and Workflow J.L. Pitcher, D. Buller, Halliburton
Alternates/Posters	
152568	Potential Unconventional Gas Supplies in Bangladesh M. Cronshaw, M.G. Bishop, L.C. Lencioni, S. Rensberger, Gustavson Associates
150855	Simulation of Coupled Flow and Mechanical Deformation Using Implicit Pressure-Displacement Explicit Saturation–Concentration (IMPDESC) Scheme A. Salama, M.F. El Amin, A.K. Negara, S. Sun, King Abdullah University of Science and Technology

Monday, 23 January, 1330–1500 hours Session 2: Drilling and Completions	
Session Chairpersons: **Badar Al-Abri**, Petroleum Development Oman; **Wael El-Mofty**, Packers Plus	
152458	Design, Application, and Implementation of Well Intervention Services Within a Deep HPHT Tight Gas Exploration and Appraisal Project J.A. Curtino, Petroleum Development Oman; T.C. Judd, A.S. Al Habsi, Schlumberger
151135	Optimised Steerable Motor Design Overcomes Drilling and Production Challenges in Unconventional Shale Plays A.A. Azizov, J.A. Fabian, W. Davila, S.S. Janwadkar, A. Jones, Baker Hughes; M.T. Nguyen, Range Resources
151626	Solving Deep 22-In Carbonate Drilling Challenges in Northern Kuwait A. Al Saleh, M. Al Khaldy, A. Shehab, Kuwait Oil Company; G.R. Portwood, O. Ghoneim, H. Maliekkal, Smith Bits–A Schlumberger Company
Alternates/Posters	
149093	Importance of Production Logging Test Design for Inflow Control Completion Evaluation R.E. Regulacion, N. Shahreyar, Halliburton; A. Al Julaih, A.M. Al Momin, Iraq Drilling Company; J.E. Lauritzen, Saudi Aramco
142413	Underbalanced Drilling in Tight Gas Exploration Wells A.M. El Morsy, Petroleum Development Oman

Monday, 23 January, 1530–1700 hours Session 3: Formation Evaluation and Petrophysics of Tight Sand I	
Session Chairpersons: **Daniel Kalinin**, Schlumberger; **Michael Bittar**, Halliburton	
153256	Petrophysical Planning and Data Acquisition for Successful Formation Evaluation in Unconventional Gas Wells A.M. Al Marzooq, N. Musharfi, Saudi Aramco

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152446	Optimising Borehole Imaging for Tight Gas Exploration: Evolving a Go-No-Go Decision Tree in Tight Gas Reservoirs of the Sultanate of Oman S. Mahruqy, Petroleum Development Oman; F. Hosein, H. Al Busaidi, J. Al Busaidi, C. Shrivastva, Schlumberger
152382	Quantifying the Role of Hematite Cement in Controlling Permeability in Deep Tight Gas Reservoirs A. Ali, S. Abdalah, Heriot-Watt University
Alternates/Posters	
151996	Petrophysical Properties Evaluation of Tight Gas Sands Using NMR and Conventional Logs G. Hamada
152724	Correlation Between Rock Permeability and Formation Resistivity Factor–A Rigorous and Theoretical Derivation K. Ling, Texas A&M University

Monday, 23 January, 1530–1700 hours
Session 4: Development and Production I

Session Chairpersons: **Ahmed Al-Shueili**, BP Exploration; **Mike Hopkins**, Halliburton

153255	Simulation of Fracturing Induced Formation Damage and Gas Production from Fractured Wells in Tight Gas Reservoirs Y.D. Ding, H. Langouet, IFP Energies Nouvelles; L. Jeannin, GDF SUEZ
153220	Hybrid Forecasting Methods for Multi-Fractured Horizontal Wells: EUR Sensitivities M. Nobakht, Fekete Associates; C.R. Clarkson, University of Calgary
151153	Flow Simulation of Tight Gas Reservoir Using the Real Gas Pseudo-Pressure B. Lu, G.S. Shiralkar, BP
Alternates/Posters	
152473	Will Gas Hydrate Lying on Oceanic Floors in India Solve its Energy Problem? A Futuristic Approach A.K. Jha, S. Alimuddin, A. Singh, Pandit Deendayal Petroleum University
152007	The Recent Applications of Jet Pump Technology to Enhance Production from Tight Oil and Gas Fields S.M. Sarshar, CALTEC

Tuesday, 24 January, 0900–1030 hours
Session 5: Formation Evaluation and Petrophysics of Tight Sand II

Session Chairpersons: **Hans-Christian Freitag**, Baker Hughes; **Saleh Al-Ruwaili**, Saudi Aramco

152636	Wireline Formation Tester Complemented by Integrated Petrophysical Evaluation Characterises an Unconventional Reservoir: A Case Study from Western Onshore India S. Shukla, A. Ojha, P.K. Tellapaneni, R.R. Jackson, Schlumberger; A. J V, K. Rai, Oil and Natural Gas Corporation
151154	Formation Evaluation Enhancement and Approach in High Overpressure and Deep Reservoir M.A. Gibrata, ADCO Producing Company; A. Ali, J. Somerville, Heriot-Watt University
152451	New Approach for the Prediction of Klinkenberg Permeability In-Situ for Low Permeability Sandstone in Tight Gas Reservoir M. Tadayoni, M. Valadkhani, National Iranian Oil Company

Alternates/Posters	
152080	Finite Difference Modelling of Water Invasion into a Tight Gas Reservoir Which is Being Drilled in an Underbalanced Mode M. Naseri, Middle East Technical University Ankara; S. Shadizadeh, Petroleum University of Technology
151037	Effect of Sand Lens Size and Hydraulic Fractures Orientation on Tight Gas Reservoirs Ultimate Recovery H. Bahrami, Curtin University

Tuesday, 24 January, 0900–1030 hours
Session 6: Development and Production II

Session Chairpersons: **Abdul Nabi Mukhtar**, BAPCO; **Hilal Al-Busidy**, Petroleum Development Oman

149784	Maximise the Placement of Wells and Production in Unconventional Reservoirs K.R. Holdaway, SAS Institute
152270	A Methodology for Determining Production Performance in Vertical Tight Gas Wells in the Red Oak Field, Arkoma Basin I. Moy, C.A. Cornette, BP
152158	Pressure Behaviour of a Hydraulic Fractured Well in Tight Gas Formation with Threshold Pressure Gradient J. Lu, S.G. Ghedan, The Petroleum Institute
Alternates/Posters	
152161	Coalseam Gas Reservoir Evaluation–New Approach on the Uncertainty Analysis and Enhanced Recovery Method R. Iskandar, AGR Group
150342	Real-Time Accurate and Controllable Gas-Lift E. Youness, J.J. Gallegos, Marathon Oil Company

Tuesday, 24 January 2012, 1100–1230 hours
Panel Session 2: Unconventional Gas Development Challenges

Moderators: **Abdul Nabi Mukhtar**, BAPCO; **Wael El-Mofty**, Packers Plus

The development of unconventional resources such as shale and tight gas reservoirs is one of the most promising, yet highly challenging trends of our industry today and is regarded as an energy game changer that could have great potential for reducing carbon emissions and environmental impacts. It could dramatically alter the energy supply picture for the whole world going forward as we continue to develop our global unconventional gas resources and improve their economical, logistical, and environmental portfolios.

There has been a rapid evolution of technologies used to characterise unconventional gas reservoirs and hydraulic fracturing techniques required for producing and effectively draining these resources. The reality for unconventional gas reservoirs is that fluid storage and transport mechanisms are still in the early stages of understanding. Therefore, for modern reservoir engineers, the process of unconventional gas development will include estimation of fluids-in-place and forecasting recovery factor and fluid production profile, in addition to prospect analysis, asset valuation, reserves estimation, and field development planning. Furthermore, it is mandatory for the optimum development of such unconventional plays to study and plan for induced hydraulic fracturing, which has the largest impact on well performance, yet methods for evaluating hydraulic fracture properties are also part of the learning curve.

This panel session will provide an overview of the legal, political, and environmental challenges and requirements associated

with unconventional gas development in the different parts of the world in addition to the different resources, e.g. human, equipment, etc. required to develop these plays. Economic challenges of field-scale development of unconventional gas plays shall be addressed with emphases on integrated project management approach with due environmental awareness.

Panelists:

- **Bernie de Hoedt**, Baker Hughes
- **Graeme Smith**, Shell
- **Mason Gomez**, Halliburton
- **Yousuf Al-Ojaili**, Oman Gas Company

Tuesday, 24 January, 1330–1500 hours Session 7: Stimulation I	
Session Chairpersons: **Bob Dickenson**, Packers Plus; **Christopher Fredd**, Schlumberger Tech Services	
152436	**Application of Novel Technologies Helps Unlocking Deep Omani Gas** A.P. Briner, H.A. Al Siyabi, J. Curtino, Petroleum Development Oman; T.C. Judd, Schlumberger
152713	**Paving the Road for the First Hydraulic Fracture Stimulation in Paleozoic Tight Gas Prospects in Offshore Abu Dhabi** A.Y. Al Zarouni, ADNOC; S.G. Ghedan, The Petroleum Institute
153221	**Productivity Increase Through Hydraulic Fracturing in Conventional and Tight Gas Reservoirs Expectation Versus Reality** Z. Rahim, A.H. Habbtar, A. Al Kanaan, H.A. Anazi, N.H. Senturk, Saudi Aramco; D.A. Kalinin, Schlumberger
144067	**A Practical Guide to Interpreting Microseismic Measurements** C.L. Cipolla, S.C. Maxwell, M.G. Mack; R. Downie, Schlumberger
Alternate/Poster	
140185	**Integrating Microseismic Mapping and Complex Fracture Modelling to Characterise Fracture Complexity** C.L. Cipolla, X. Weng, M.G. Mack, U. Ganguly, H. Gu, O. Kresse, C. Cohen, R. Wu, Schlumberger

Tuesday, 24 January, 1330–1500 hours Session 8: Shale Gas I	
Session Chairpersons: **Michael Bittar**, Halliburton Energy Services Group; **Saleh Al-Ruwaili**, Saudi Aramco	
153022	**A Workflow for Modelling, Simulation, and Optimisation of Hydraulic Fracture in Unconventional Gas Reservoir** M. Mirzaei, Schlumberger
153265	**Proper Selection of Surfactant Additive Ensures Better Well Stimulation in Unconventional Oil and Gas Formations** L. Xu, Multi-Chem A Halliburton Service; D.A. Little, EOG Resources
152288	**Managing Well Challenges in the First Shale Gas Well Of India** P.K. Mahata, D. Ghosh, R. Misra, ONGC; K. Agrawal, T. Cherchawankul, C. Malagon, Schlumberger
Alternate/Poster	
150269	**Effects of VTI Anisotropy on Shale Reservoir Characterisation** N.C. Banik, M.S. Egan, WesternGeco

Tuesday, 24 January, 1530–1700 hours Session 9: Stimulation II	
Session Chairpersons: **Keith Parry**, Weatherford; **Tariq Al-Shabibi**, ADCO	
153235	**Coiled Tubing Operational Guidelines in Conjunction with Multi-Stage Fracturing Completions in the Tight Gas Fields of Saudi Arabia** J.T. Abel, New Tech Global; B.B. Johnston, Packers Plus; M. Al Gazal, Saudi Aramco; H. Wortmann, S. Wilson, Schlumberger
152269	**Integrated Methodology for Controlled Stimulation of Unconventional Gas Resources** A.M. El Rabaa, M. Zielonka, J. Gupta, R.A. Albert, N.H. Choi, ExxonMobil, H.A. Burnham, XTO Energy
153227	**Influence of Rock Properties and Geomechanics on Hydraulic Fracturing: A Case Study from the Amin Deep Tight Gas Reservoir, Sultanate of Oman** S.V. Perumalla, A. Santagati, M. Addis, Baker Hughes; A.P. Briner, J. Curtino, L. Qobi, S. Mahruqy, Petroleum Development Oman
Alternates/Posters	
151587	**3D Modelling of Fracture Initiation from Perforated Non-Cemented Wellbore** D.I. Potapenko, O.P. Alekseenko, Schlumberger; V.N. Lapin, D. Kuranakov, D. Esipov, S.G. Cherny, Institute of Computational Technologies, Siberian Branch of Russian Academy of Sciences
149869	**Stimulation Unlocks Coal Bed Methane: Lessons Learnt in India** S.A. Pooniwala, Baker Hughes

Tuesday, 24 January, 1530–1700 hours Session 10: Shale Gas II	
Session Chairpersons: **Saleh Al-Ruwaili**, Saudi Aramco; **Tariq Al-Shabibi**, ADCO	
153225	**Measuring the Impact of Geomechanical Heterogeneity in Organic Shales on Hydraulic Fracture Initiation and Propagation** G. Waters, R. Zhao, Schlumberger
152110	**Simulation of Shale Gas Field Development: An Example from Western Australia** S. Goedeke, OPES Petroleum Engineering Services; M. Hossain, Curtin University
152166	**Evaluation of Shale Gas Prospect in Cambay Shale, Cambay Basin, India Using Well Logs and Geochemical Data** A. Bhanja, R. Chandra, B.K. Saikia, A. Samanta, Oil and Natural Gas Corporation
Alternate/Poster	
147226	**Understanding and Predicting Fayetteville Shale Gas Production Through Integrated Seismic-to-Simulation Reservoir Characterisation Workflow** H. Ramakrishnan, E.A. Peza, S. Sinha, M.A. Woods, Schlumberger Data and Consulting Services; C. Ikeocha, F.A. Mengel, Y. Simon, P. Pearce, S.F. Mcketta, J.D. Jeffers, Southwestern Energy Company

Wednesday, 25 January, 0900–1300 hours Session 11: Stimulation III	
Session Chairpersons: Daniel Kalinin, Schlumberger; Hans-Christian Freitag, Baker Hughes	
146776	The Effect of Mechanical Properties Anisotropy in the Generation of Hydraulic Fractures in Organic Shales G.A. Waters, R.E. Lewis, D. Bentley, Schlumberger
151128	Hydraulic Fracture Optimisation in Unconventional Reservoirs P.M. Saldungaray, T.T. Palisch, CARBO Ceramics
153131	Interpreting Uncemented Multi-Stage Hydraulic Fracturing Completion Effectiveness Using Fiber-Optic DTS Injection Data E.H. Holley, Halliburton; M.M. Molenaar, B.M. Banack, Pinnacle, E. Fidan, Shell Canada
Alternates/Posters	
152351	Comprehensive Approach to Production Stimulation of Massive Cold Heterogeneous Carbonate Formation R.F. Ilgildin, A.N. Mokshaev, O.M. Bogatyrev, V.I. Dnistrjanskij, Gazprom Dobycha Orenburg; M.A. Lobov, R.E. Kayumov, K. Burdin, Schlumberger
150514	Efficient Coiled Tubing Fracturing for Proppant Placement Assurance and Contingency Cost Mitigation J.B. Surjaatmadja, L.E. East, Halliburton

Wednesday, 25 January, 0900–1300 hours Session 12: Case Studies I	
Session Chairpersons: Tariq Al-Shabibi, ADCO; Vincent Flores, VAM Drilling	
151615	Solving Multiple Carbonate Challenges: TCI Delivers Performance Step-Change Drilling Deep 28-In Hole Section M.J. Al Saeedi, F. Al Fayez, M. Sounderrajan, M.N. Al Mudhaf, Kuwait Oil Company; G.R. Portwood, O. Ghoneim, H. Maliekkal, Smith Bits–A Schlumberger Company
152570	Wattenberg Field Case Study Unconventional Reservoir Case Study E.C. Moritz, L.C. Lencioni, Gustavson Associates
153834	Intervention-Less Completions for Unconventional Shale Plays J.M. Tough, J. Mason, S. Hatton, P. Day, Petrowell Limited
Alternates/Posters	
152004	Cementing Stage Tools Field Application Analysis: Saudi Aramco Experience J.D. Faria, Halliburton BV; M.A. Muqeem, A.B. Ahmad, A.A. Al-Hajji, Saudi Aramco; A. Faraj, Weatherford Saudi Arabia Limited
152488	Managing LNG Deliverability; An Innovative Approach Using Neural Network and Proxy Modelling for Australian CSG Assets R. Trivedi, S.S. Biniwale, Schlumberger

Wednesday, 25 January, 1100–1230 hours Session 13: Stimulation IV	
Session Chairpersons: **Hilal Al-Busidy**, Petroleum Development Oman; **Wael El-Mofty**, Packers Plus	
152439	Pinpoint Multi-Stage Fracturing of Tight Gas Sands: An Integrated Model with Constraints M.M. Rahman, The Petroleum Institute; H. Yu, China University of Petroleum Beijing
153044	Understanding Well Completion Strategies in Tight Reservoirs Through Numerical Simulation C.M. Lopez, L.A. Saputelli, Hess Corporation
149887	Well Test Analysis of Infrequent Behaviour of Fractured Wells in Oil and Gas Reservoirs A. Amin, Imperial College London
Alternate/Poster	
153144	Hydraulic Fracturing of CBM Wells in India Using Coiled Tubing and Hydrajet Perforating Operational and Technological Learnings F. Adil, A. Sharma, Halliburton; S. Bhat

Wednesday, 25 January, 1100–1230 hours Session 14: Case Studies II	
Session Chairpersons: **Bob Dickenson**, Packers Plus; **Keith Parry**, Weatherford	
153677	Role of Geomechanics in Accessing Deep Tight Gas Volumes in Northern Oman L. Qobi, K. Khaburi, S. Mahrooqi, J. Curtino, A.P. Briner, Petroleum Development Oman
151953	Planning and Well Design for Kuwait Oil Company's First North Kuwait Jurassic Horizontal Well: A Case History M. Saeedi, F. Fayez, D. Al Enezi, M. Sounderrajan, Kuwait Oil Company; V. Chimirala, Schlumberger D&M–Kuwait; G. Giridhara, D.C. Mckinnell, Total
149783	The Evolution of the Drill String Design on Sinopec Field (Puguang) to Improve Performance and Safety Margins in Sour Environment K. El Bachiri, V.P. Flores, VAM Drilling; L. FEI, Sinopec; Y. Li, D. Zhang, Zhongyuan Drilling Services
Alternates/Posters	
150044	Integrated Approach Towards a Successful Detection, Mitigation, and Prevention of Cross Reservoir Communication in a Horizontal Oil Producer: A Case Study A.A. Al Khalaf, S. Kumar, A.M. Al Salman, Z.R. BenSaad, A.A. Mukhaitah, Saudi Aramco
154452	Challenges in Sour Gas Handling for Kuwait Jurassic Sour Gas B. Al Qaoud, Kuwait Oil Company

Wednesday, 25 January, 1330–1500 hours Session 15: Technology Challenges and Emerging Solutions	
Session Chairpersons: **Badar Al-Abri**, Petroleum Development Oman; **Michael Bittar**, Halliburton	
153124	Constraining Stress Tensors Using Shear Sonic Anisotropy Directions and Breakout Orientations in a Deviated Well, Western Offshore, India R.R. Kumar, D.G. Rao, S. Swain, Schlumberger

150856	New Hydraulic Fracturing Process Enables a Low Risk, Operationally Efficient Solution While Maximising Stimulation Effectiveness in Unconventional Reservoirs D.J. Beaman, F. Mcneil, Halliburton
153286	Innovation Provides Maximum Stage Density and Improved Completion Efficiencies in the Williston Basin S. Arabsky, J. Fehr, J.D. Jany, Packers Plus Energy Services; M.M. Starr, QEP Resources
Alternates/Posters	
154145	Changing Stimulation Planning Forever P.M. Day, S. Hatton, D. Purkis, Petrowell
151559	A Pinpoint Technology that Improves Efficiencies While Solving Current Issues with Hydraulic Fracturing Process D.V. Chellani, C. Ables, N. Gurnito, Halliburton

Wednesday, 25 January 2012, 1500–1630 hours
Panel Session 3: Unconventional Gas Expertise

Moderators: Hans-Christian Freitag, Baker Hughes; Saleh Rawaili, Saudi Aramco

The last few years have seen a strong growth of interest in the potential of unconventional gas in the Middle East–spurred on largely by the success of unconventional gas in North America and the domestic demand for gas in the Middle East. It is therefore important to review the reasons for the success of unconventional gas in North America as well as the lessons learnt and the expertise accumulated. The keys to unlocking tight gas and potential in North America were found over the past decade or two while the keys to unlocking shale gas potential in North America were found over the past seven or eight years. Through continued efforts by large number of UG operators, closely helped by service companies, cost-effective technologies and operational workflows were developed through series of "trial and error" approaches. The use of factory-mode shale gas operations comprising drilling and completion, large-scale hydro-fracks and efficient workflows can make the shale gas economics potentially successful. Beyond that, shale gas petrophysics, geophysics, rock mechanics, reservoir engineering, and development practices still have not been fully exploited.

Panelists:

- Brian Gratto, Saudi Aramco
- Khaled Nouh, Baker Hughes
- Michael Navaratte, Halliburton
- Peter Richter, Schlumberger

Updates after 17 November will be reflected in the onsite conference programme.

Cancellation Policy

Cancellations must be submitted in writing to SPE Middle East, North Africa, and India, by fax to +971.4.457.3164 or email to aprathap@spe.org. Cancellations received prior to 15 December 2011 will receive a full refund less USD 100 processing fee. Cancellations received after 15 December 2011 and no-shows are not eligible for a refund.

Conference Proceedings

A copy of the Conference Proceedings on CD-ROM is included in the full conference registration fee. One-day attendees can purchase CD Proceedings for USD 200 for SPE members and USD 300 for nonmembers. Additional copies may be ordered using the registration form.

Copyright Information

All sessions are protected by US copyright laws. Photography and video/audio recording of any kind are strictly prohibited in the sessions and throughout the exhibition area except for authorised press.

Exhibition

The exhibition will take place at the Beach Rotana Hotel, Abu Dhabi and will be open at the following times:

Monday, 23 January 2012..... 1000–1730 hours
Tuesday, 24 January 2012..... 0930–1730 hours
Wednesday, 25 January 2012..... 0930–1530 hours

A one-day exhibition visitor pass can be purchased for USD 20 and a three-day exhibition visitor pass can be purchased for USD 50.

If you would like to book an exhibition stand or sponsor the event, please contact Sween Rajan, sponsorship and exhibits specialist, on +971.4.457.5800 or at srajan@spe.org.

Gala Dinner

The UGAS Gala Dinner is scheduled to take place at 1900 hours on Monday, 23 January 2012. A Gala Dinner ticket is included in the full conference registration fee. Should you wish to purchase additional tickets for USD 75 each, please fill in the registration form.

Luncheons

Luncheons will be served on Monday, 23 January, Tuesday, 24 January, and Wednesday, 25 January. Luncheon tickets are included in the full conference registration fee. The one-day conference registration fee includes a luncheon ticket for that day. Should you wish to purchase additional luncheon tickets for USD 70 each, please indicate for which day(s) on the registration form.

Registration

Online registration is available at www.spe.org/events/ugas. Alternatively, you may fax the completed registration form to +971.4.457.3164, or send a scanned copy of it by email to formsdubai@spe.org. Onsite registration and delegate badge collection will take place at the Beach Rotana Hotel, Abu Dhabi at the following times:

Sunday, 22 January 2012.....1600–1800 hours
Monday, 23 January 2012..... 0730–1730 hours
Tuesday, 24 January 2012..... 0900–1730 hours
Wednesday, 25 January 2012..... 0900–1500 hours

Students

Registration for students is complimentary, and includes admission to all technical sessions, exhibition, and coffee breaks. Students are required to fax/e-mail a copy of their current student ID along with the registration form. Student registration does not include CD Proceedings or Luncheons.

Visa Information

SPE Middle East, North Africa, and India will assist in providing a visa invitation letter, upon request in writing, to confirmed registrants after receiving full payment of registration fees. Visa invitation letters take five days to issue from the date of request and it is the delegate's responsibility to obtain their own visa. SPE cannot issue the visa nor can we guarantee it will be obtained.

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3 April 2012, 1600–1900 hours
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For more information, please contact Saba Faghihi at sfaghihi@spe.org or Rasha Badran at rbadran@spe.org.

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Abu Dhabi is the capital and the largest of the seven Emirates. It's natural desert climate and convenient location in the Arabian Gulf has endowed it with warm seas and white sandy beaches. Its long coastline and shallow waters of the southern Gulf, extend from the base of the Qatar Peninsula in the west to the border of the Emirate of Dubai on the northeast.

Abu Dhabi is one of the most modern and richest cities in the world. It provides tourists with large manicured gardens and parks, green boulevards lining the streets, sophisticated high rise buildings, high quality infrastructure, international luxury hotel chains and opulent shopping malls, while still holding on to its rich Arabian culture and history.

Climate
Abu Dhabi has a hot, arid climate. Sunshine and blue skies can be expected throughout the year. The months of June through September are generally hot and humid with temperatures averaging above 35°C. Temperatures cool to around 20°C in the winter months.

Time Zone
Abu Dhabi is four (4) hours ahead of GMT (+4 GMT)

Currency
The UAE Dirham (Dhs.) is the official currency and is also referred to as Arab Emirate Dirham (AED). The exchange rate is approximately:

USD 1 = AED 3.67
GBP 1 = AED 5.79

Voltage
Voltage is 220 volts AC.

Suggested Wardrobe
Lightweight summer clothing is ideal with a wrap, sweater, or jacket for air-conditioned premises. Women are advised to dress modestly.

Language
While Arabic is UAE's official language, English and Hindi are widely spoken. Other languages such as French, German, etc. are also used in the UAE.

Emergencies
Police: 999

Updates after 17 November will be reflected in the onsite conference programme.

SPE Middle East
Unconventional Gas Conference and Exhibition (UGAS)

23–25 January 2012, Beach Rotana Hotel, Abu Dhabi, UAE

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DELEGATE INFORMATION-UR

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Country	Zip/Postal Code	
Office Telephone (include country/area/city code)	Facsimile (include country/area/city code)	
Email	Job Title	

REGISTRATION COSTS

	Before 15 November 2011		After 15 November 2011 or Onsite		Author, Presenter, Committee, Session Chair, Panelist
	SPE Member	Nonmember	SPE Member	Nonmember	
Two-Day Workshop and Two-Day Conference Includes workshop sessions, materials, daily coffee breaks and luncheons, conference sessions, exhibiton, and one gala dinner ticket.	USD 2,000 ❑	USD 2,150 ❑	USD 2,400 ❑	USD 2,550 ❑	USD 1,850 ❑
	❑ Monday, 23 January ❑ Tuesday, 24 January ❑ Wednesday, 25 January				
Two-Day Workshop and One-Day Conference Includes workshop sessions, materials, daily coffee breaks and luncheons, conference sessions, exhibiton, and one gala dinner ticket.	USD 1,800 ❑	USD 1,950 ❑	USD 2,200 ❑	USD 2,350 ❑	USD 1,650 ❑
	❑ Monday, 23 January ❑ Tuesday, 24 January ❑ Wednesday, 25 January				
Two-Day Workshop Includes workshop sessions, materials, daily coffee breaks and luncheons, and one gala dinner ticket.	USD 1,500 ❑	USD 1,650 ❑	USD 1,900 ❑	USD 2,050 ❑	USD 1,500 ❑
Three-Day Conference Includes all conference sessions, exhibition, CD proceedings, daily coffee breaks and luncheons, one gala dinner ticket, and one delegate bag.	USD 845 ❑	USD 995 ❑	USD 945 ❑	USD 1,095 ❑	Before 15 Nov USD 595 ❑ After 15 Nov USD 695 ❑
One-Day Conference Includes conference sessions, exhibition, coffee breaks and luncheons on specified day. Gala dinner ticket is included for registrations on Monday, 23 January.	USD 400 ❑	USD 500 ❑	N/A	N/A	N/A
	❑ Monday, 23 January ❑ Tuesday, 24 January ❑ Wednesday, 25 January				
One-Day Training Course Includes training course materials, coffee breaks, and luncheon.	USD 600 ❑	USD 750 ❑	USD 700 ❑	USD 850 ❑	N/A
One-Day Training Course and Three-Day Conference Includes all conference sessions, exhibition, CD proceedings, daily coffee breaks and luncheons, one gala dinner ticket, one delegate bag, and training course materials.	USD 1445 ❑	USD 1745 ❑	USD 1595 ❑	USD 1895 ❑	N/A

Additional Tickets		COST IN USD
Luncheon Ticket (please select date) ❑ Monday, 23 January ❑ Tuesday, 24 January ❑ Wednesday, 25 January	USD 70 × (_____ tickets)	
Gala Dinner (Monday, 23 January)	USD 75 × (_____ tickets)	
CD Proceedings	USD 200 (SPE Member) × (_____) USD 300 (Nonmember) × (_____)	
Visitor (Exhibition Only)-3 days/Visitor (Exhibition Only)-1 day	USD 50 × (_____ tickets)/USD 20 x (_____ tickets)	
Student (valid ID required)	Complimentary × (_____ tickets)	
IMPORTANT: All fees paid to SPE are net of taxes. The registration fees in this form do not include any local or withholding taxes. All such taxes will be added to the above-mentioned registration fees in the invoice.		**Total Cost**

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Payment can be made by credit cards or bank transfers. All payments should be made in USD.

❑ Bank Transfer	Cancellation Policy
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