18 – 19 November 2019
Brisbane Convention & Exhibition Centre,
Brisbane, Australia

ASIA PACIFIC UNCONVENTIONAL®
RESOURCES TECHNOLOGY CONFERENCE
FUELED BY SPE • AAPG • SEG

Conference Programme

EXPANDING UNCONVENTIONALS
Making It Happen

go.spe.org/19APURC
passion with a purpose

At Aramco, we inspire passion in our people by offering them the opportunity to do the work they dreamed of doing, and by supporting them in achieving more than they thought possible. Our employees derive a sense of purpose from knowing their work has the potential to make a positive impact on a global scale. By promoting passion with a purpose, we cultivate a high-performance workforce ready to take on the world’s challenges.

Join us in unlocking the full potential of the Kingdom’s resources. To find out more about our operations and opportunities to grow your career, visit our exhibition booth or website at jobsataramco.eu.

We’re proud to be a sponsor of the Asia Pacific Unconventional Resources Technology Conference.
Message from the Technical Programme Co-Chairs

Dear Colleagues,

On behalf of the Technical Programme Committee, welcome to Brisbane and thank you for attending the inaugural Asia Pacific Unconventional Resources Technology Conference (APAC URTeC).

The APAC URTeC is a joint effort between the Society of Petroleum Engineers (SPE), American Association of Petroleum Geologists (AAPG) and the Society of Exploration Geophysicists (SEG).

Themed “Expanding Unconventionals – Making it Happen” and with over 100 technical presentations from 42 organisations, the APAC URTeC will gather regional and global experts, regulators and prominent researchers to share their technical know-how and technology advancements, providing us with new perspectives in evaluating and optimising the extraction of unconventional resources in the Asia Pacific region. The conference programme features high level dialogues between senior executives and industry experts at the Executive Plenary, Technical Plenary and Panel Sessions, diving into topics such as:

- Expanding Unconventionals – Making it Happen Technically in Asia Pacific
- “Facts and Fiction” Unconventional Projects Outside North America
- CSG to LNG in Queensland – A Decade of Industry Learnings
- Unconventional Gas and the Social License to Operate

The technical exhibition showcases the latest technical developments and provides a platform for exhibitors to demonstrate the scope of their business, service capabilities and products.

The conference also welcomes delegates to take part in the Welcome Reception for further networking opportunities.

Once again, we thank you for your support and participation at this conference and hope you will have an enriching experience while enjoying the vibrant city of Brisbane.

Regards,
Technical Programme Co-Chairs

Raymond Johnson Jr.
SPE Co-Chair
The University of Queensland

Andrew Garnett
AAPG Co-Chair
The University of Queensland Centre for Natural Gas

David Close
SEG Co-Chair
Santos

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* This Conference Programme is updated as at 1 November 2019
Committees

Technical Programme Co-Chairs
Raymond Johnson Jr., SPE
The University of Queensland
Andrew Garnett, AAPG
The University of Queensland Centre for Natural Gas
David Close, SEG
Santos

SPE Committee Members
George Koperna
Advanced Resources International
Qi Tian
Chinese Academy of Engineering
Thomas Flottman
Origin Energy

Dan Kuznetsov
Arrow Energy
Jennifer Miskimins
Colorado School of Mines
Buddy Woodroof
ProTechnics Division of Core Laboratories

Ted Bergman
Arrow Energy
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Condor Energy Services
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Tom Neville
Asia-Pacific Formation Evaluation Services
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Brownyn Camac
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Bazan Consulting
Dilhan Ilk
ConocoPhillips
Mark Burgoyne
Santos

Martin Rylance
BP Exploration
Hani Farouq Mutie Abul Khair
Consultant/Unconventional Geomechanics
Simon Chipperfield
Santos

Rod Bresnehan
CFT Holdings (HK)
Jeremy Meyer
Ikon Science
Daniel Kalinin
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Baosheng Liang
Chevron
Stephen Kelemen
Independent Industry Professional
Matthew Loth
Schlumberger

Changdong Yang
Chevron
Vincent Artus
Kappa Engineering
Luis Baez
Shell

Hao Sun
Chevron
Deborah Ryan
MHA Petroleum Consultants
Pankaj Bhavnani
Shell

Johannes Alvarez
Chevron
Alexander Cote
Origin Energy
Scott Goligher
Shell

Gensheng Li
China University of Petroleum
Sameer Ganpule
Origin Energy
Saikat Mazumder
Shell Development Australia
**Committees**

**SPE Committee Members (continued)**

Susan Howes  
*Subsurface Consultants & Associates*

Fangui Zeng  
*Taiyuan University of Technology*

Nefeli Moridis  
*Texas A&M University*

Sam Noynaert  
*Texas A&M University*

Christopher Leonardi  
*The University of Queensland*

Stephen Begg  
*University of Adelaide*

Marcel Croon  
*Weatherford*

Robert Fulks  
*Weatherford*

Usman Ahmed

**AAPG Committee Members**

Stephanie Perry  
*Anadarko Petroleum Corporation*

Chris Mijnssen  
*Arrow Energy*

Xingjin Wang  
*Denison Gas*

Steve Mackie  
*Geosim Consulting Pty. Ltd*

Jim Underschultz  
*Petroleum Hydrogeology International*

Iain Rodger  
*The University of Queensland Centre for Natural Gas*

Suzanne Hurter  
*The University of Queensland Centre for Natural Gas*

**SEG Committee Members**

Paul Anderson  
*Oxy*

Rob Ross  
*Qeye*

Creties Jenkins  
*Rose and Associates*

Randall Taylor  
*Taylor Exploration Consulting*

Dennis Cooke  
*ZDAC Geophysical Technologies*

**PESA Committee Members**

Samantha Ware  
*Origin Energy*

Rachel Kieft  
*Senex Energy*
Thank You to Our Sponsors

General Sponsors

Welcome Reception (18 November) Sponsor
Conference Bags Sponsor
Silver Sponsor

Conference Badge Sponsor
Directional Signage Sponsor
Networking Luncheon - Day 1 (18 November) Sponsor

Conference Preview and Programme Sponsor
Water Bottles and Stations Sponsor
Writing Pads and Pens Sponsor

Coffee Breaks - Day 1 and Day 2 Sponsor
Ice Cream Social - Day 1 and Day 2 Sponsor
Meeting Room Guide

Brisbane Convention and Exhibition Centre

BOULEVARD ROOM
Exhibition, Coffee Breaks, Networking Luncheons, Knowledge Sharing ePoster Sessions, NERA Innovation Session (18 November) and Welcome Reception (18 November)

BOULEVARD ROOM FOYER
Headquarters and Speaker / Author Check-In

BOULEVARD B1-B3
Opening, Keynote, Executive Plenary, Technical Plenary, Panel and Technical Sessions

BOULEVARD B1-B3 FOYER
Registration

BOULEVARD LEVEL
### Schedule of Events

#### Sunday, 17 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>1200 – 1800 hours</td>
<td><strong>Registration</strong></td>
<td>Boulevard B1-B3 Foyer</td>
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<tr>
<td>1200 – 1800 hours</td>
<td><strong>Speaker / Author Check-In</strong></td>
<td>Boulevard Room Foyer</td>
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<tr>
<td>1200 – 1800 hours</td>
<td><strong>Exhibitors Move-In</strong></td>
<td>Boulevard Room</td>
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#### Monday, 18 November

<table>
<thead>
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<tr>
<td>0730 – 1830 hours</td>
<td><strong>Registration</strong></td>
<td>Boulevard B1-B3 Foyer</td>
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<tr>
<td>0730 – 1830 hours</td>
<td><strong>Speaker / Author Check-In</strong></td>
<td>Boulevard Room Foyer</td>
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<tr>
<td>0900 – 0930 hours</td>
<td><strong>Opening and Keynote Session</strong></td>
<td>Boulevard B1-B3</td>
</tr>
<tr>
<td>0930 – 1030 hours</td>
<td><strong>Executive Plenary Session:</strong> Expanding Unconventionals – Making it Happen Technically in Asia Pacific</td>
<td>Boulevard B1-B3</td>
</tr>
<tr>
<td>1030 – 1100 hours</td>
<td>Knowledge Sharing ePoster Session 1 / Coffee Break</td>
<td>Boulevard Room</td>
</tr>
<tr>
<td>1030 – 1830 hours</td>
<td><strong>Exhibition</strong></td>
<td>Boulevard Room</td>
</tr>
<tr>
<td>1100 – 1230 hours</td>
<td><strong>Technical Plenary Session:</strong> Expanding Unconventionals – Making it Happen</td>
<td>Boulevard B1-B3</td>
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<tr>
<td>1230 – 1400 hours</td>
<td><strong>Networking Luncheon</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1300 – 1330 hours</td>
<td>Knowledge Sharing ePoster Session 2</td>
<td>Boulevard Room</td>
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<tr>
<td>1330 – 1400 hours</td>
<td>Knowledge Sharing ePoster Session 3</td>
<td>Boulevard Room</td>
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<tr>
<td>1400 – 1530 hours</td>
<td><strong>Technical Session 1:</strong> CSG Drilling and Completions</td>
<td>Boulevard B1</td>
</tr>
<tr>
<td>1400 – 1530 hours</td>
<td><strong>Technical Session 2:</strong> Faults, Fracture and (Micro) Seismicity</td>
<td>Boulevard B2</td>
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<tr>
<td>1400 – 1530 hours</td>
<td><strong>Technical Session 3:</strong> Case Studies: Expanding Shale and Tight Gas Beyond North America</td>
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<td>1530 – 1600 hours</td>
<td>Knowledge Sharing ePoster Session 4 / Coffee Break</td>
<td>Boulevard Room</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Panel Session 1:</strong> “Facts and Fiction” Unconventional Projects Outside North America</td>
<td>Boulevard B1</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Technical Session 4:</strong> Evaluating Reservoir Quality in Shales and Coals</td>
<td>Boulevard B2</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Technical Session 5:</strong> Communicating External Opportunities and Risks</td>
<td>Boulevard B3</td>
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<tr>
<td>1730 – 1830 hours</td>
<td>NERA Innovation Session / Welcome Reception</td>
<td>Boulevard Room</td>
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## Schedule of Events

### Tuesday, 19 November

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<td>0800 – 1730 hours</td>
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<td><strong>Speaker / Author Check-In</strong></td>
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<tr>
<td>0900 – 1030 hours</td>
<td><strong>Technical Session 6: CSG Reservoir Models</strong></td>
<td>Boulevard B1</td>
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<tr>
<td>0900 – 1030 hours</td>
<td><strong>Technical Session 7: Getting the Shale Geosciences Right</strong></td>
<td>Boulevard B2</td>
</tr>
<tr>
<td>0900 – 1030 hours</td>
<td><strong>Technical Session 8: Stimulating the Deep, Hot, Tight Reservoirs</strong></td>
<td>Boulevard B3</td>
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<tr>
<td>1000 – 1600 hours</td>
<td><strong>Exhibition</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1030 – 1100 hours</td>
<td><strong>Knowledge Sharing ePoster Session 5 / Coffee Break</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1100 – 1230 hours</td>
<td><strong>Panel Session 2: CSG to LNG in Queensland – A Decade of Industry Learnings</strong></td>
<td>Boulevard B1</td>
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<tr>
<td>1100 – 1230 hours</td>
<td><strong>Technical Session 10: Production Data Analysis: A Reality Check</strong></td>
<td>Boulevard B3</td>
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<tr>
<td>1230 – 1400 hours</td>
<td><strong>Networking Luncheon</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1300 – 1330 hours</td>
<td><strong>Knowledge Sharing ePoster Session 6</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1330 – 1400 hours</td>
<td><strong>Knowledge Sharing ePoster Session 7</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1400 – 1530 hours</td>
<td><strong>Panel Session 3: Unconventional Gas and the Social License to Operate</strong></td>
<td>Boulevard B1</td>
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<tr>
<td>1400 – 1530 hours</td>
<td><strong>Technical Session 11: Assessing CSG Reservoir Properties</strong></td>
<td>Boulevard B2</td>
</tr>
<tr>
<td>1400 – 1530 hours</td>
<td><strong>Technical Session 12: The Finer Details of Shale Stimulation and Production</strong></td>
<td>Boulevard B3</td>
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<tr>
<td>1530 – 1600 hours</td>
<td><strong>Knowledge Sharing ePoster Session 8 / Coffee Break</strong></td>
<td>Boulevard Room</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Technical Session 13: Improving CSG Well Production</strong></td>
<td>Boulevard B1</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Technical Session 14: Applying Geomechanics in a Stressed World</strong></td>
<td>Boulevard B2</td>
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<tr>
<td>1600 – 1730 hours</td>
<td><strong>Technical Session 15: Modelling All Things Big and Small in Shales</strong></td>
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### Wednesday, 20 November

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<tr>
<td>0900 – 1800 hours</td>
<td><strong>SPE Training Course: Mastering Uncertainty and Risk in Unconventional Reservoir Assessment (Shale, Coals, Tight Sandstones &amp; Carbonates)</strong></td>
<td>Bastille 1, Sofitel Brisbane Central</td>
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<tr>
<td>0900 – 1800 hours</td>
<td><strong>AAPG Training Course: Volumetric Analysis of Shale Reservoirs</strong></td>
<td>St. Germain, Sofitel Brisbane Central</td>
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<tr>
<td>0900 – 1800 hours</td>
<td><strong>SPE Queensland Section Training Course: Applied Statistical Modelling and Data Analytics for Reservoir Performance Analysis</strong></td>
<td>Bastille 2, Sofitel Brisbane Central</td>
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## Conference Programme Schedule

<table>
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<th>Time</th>
<th>Boulevard B1</th>
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<td><strong>Monday, 18 November 2019</strong></td>
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<tr>
<td>0900 - 0930 hours</td>
<td>Opening and Keynote Session</td>
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<td>Expanding Unconventionals - Making it Happen</td>
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<td>1030 - 1100 hours</td>
<td>Knowledge Sharing ePoster Session 1 / Coffee Break - Boulevard Room</td>
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<td>Technical Plenary Session</td>
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<td>Knowledge Sharing ePoster Session 4 / Coffee Break - Boulevard Room</td>
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<td>1600 - 1730 hours</td>
<td>Panel Session 1 &quot;Facts and Fiction&quot; Unconventional Projects Outside North America</td>
<td>Technical Session 4 Evaluating Reservoir Quality in Shales and Coals</td>
<td>Technical Session 5 Communicating External Opportunities and Risks</td>
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<tr>
<td>0900 - 1030 hours</td>
<td>Technical Session 6 CSG Reservoir Models</td>
<td>Technical Session 7 Getting the Shale Geosciences Right</td>
<td>Technical Session 8 Stimulating the Deep, Hot, Tight Reservoirs</td>
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<td>Knowledge Sharing ePoster Session 5 / Coffee Break - Boulevard Room</td>
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<tr>
<td>1100 - 1230 hours</td>
<td>Panel Session 2 CSG to LNG in Queensland - A Decade of Industry Learnings</td>
<td>Technical Session 9 Geology of Coal: What Matters?</td>
<td>Technical Session 10 Production Data Analysis: A Reality Check</td>
</tr>
<tr>
<td>1230 - 1400 hours</td>
<td>Networking Luncheon - Boulevard Room</td>
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<tr>
<td>1300 - 1330 hours</td>
<td>Knowledge Sharing ePoster Session 6 - Boulevard Room</td>
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<td>Technical Session 15 Modelling All Things Big and Small in Shales</td>
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DOWNLOAD THE ASIA PACIFIC URTEC 2019 MOBILE APP

1. Download the SPE International mobile app via the Apple App Store and Google Play
2. Tap on the Top Menu and select Events
3. Select Asia Pacific URTeC 2019 to access the Asia Pacific URTeC 2019 app

GET THE FULL PROGRAMME AT YOUR FINGERTIPS!

FEATURES:
- **ACCESS** full conference programme
- **FIND** exhibitors and solutions of your choice and locate them at-event
- **RECEIVE** notifications on daily activities including networking opportunities

Scan to Download
General Information

REMINDER: CONFERENCE AND EXHIBITION BADGES MUST BE WORN AT ALL TIMES

Venue
Brisbane Convention & Exhibition Centre (BCEC)
Cnr Merivale & Glenelg Streets
P.O. Box 3869 South Bank
Brisbane, Queensland 4101
Australia
P: +61.7.3308.3000
W: www.bcec.com.au

Event Headquarters
Boulevard Room Foyer,
Boulevard Level
Cnr Merivale & Glenelg Streets
P.O. Box 3869 South Bank
Brisbane, Queensland 4101
Australia
P: +61.7.3308.3000
W: www.bcec.com.au

Speaker/Author Check-In Room
Speakers, moderators, presenting authors and session chairs are required to report to the Speaker/Author Check-In Room at Boulevard Room Foyer, Boulevard Level to load/review their PowerPoint slides.

Changes to presentation slides will not be accepted less than four hours prior to the session.

Speakers, moderators, presenting authors and session chairs must report to their assigned session rooms 30 minutes before the session begins.

Safety and Security
The safety and security of our event attendees are of utmost importance. Please be aware of and observe the following:

- Conference and exhibition badges must be worn at all times while at the event venue. Use of a badge by a person not named on the badge is grounds for confiscation.
- If you lose your badge, please return to the registration counter to obtain a replacement.
- No one under the age of 15 is permitted in the exhibition halls.
- Be aware of your surroundings, remain alert and be vigilant.
- Should you observe any suspicious packages or behaviour, please report to event/venue staff immediately.
- Due to the popularity of some session topics, it is possible for overcrowding to occur in a session or meeting room. Should this occur, we must comply with policies regarding room capacity and limit admittance to a room that is at capacity. Please make plans to arrive early for sessions that you have a strong interest in attending.
- Please remember to stay hydrated throughout the event.
- In the event of an emergency, please follow direction of emergency personnel and authorities.
General Information

Badge Collection
Conference and exhibition badges are required for admission into the event and must be worn at all times. Badges are non-transferable. Use of a badge by a person not named on the badge is grounds for confiscation.

Badges can be collected at Registration Counter, Boulevard B1-B3 Foyer, Boulevard Level, Brisbane Convention & Exhibition Centre during the following times:
- Sunday, 17 November 2019: 1200 - 1800 hours
- Monday, 18 November 2019: 0730 – 1830 hours
- Tuesday, 19 November 2019: 0800 – 1730 hours

Digital Proceedings
Digital proceedings are available for collection at the Registration Counter, Boulevard B1-B3 Foyer, Boulevard Level.

To purchase the proceedings, please go to the Registration Counter located at Boulevard B1-B3 Foyer, Boulevard Level.

Exhibition Hours
The exhibition is open to all attendees at the following times:
- Monday, 18 November 2019: 1030 – 1830 hours
- Tuesday, 19 November 2019: 1000 – 1600 hours

Lost and Found
Lost and found items will be placed at Event Headquarters, Boulevard Room Foyer, Boulevard Level.

First Aid
In case of an emergency situation, please alert the nearest SPE staff immediately.

First aid and medical assistance is available at Medical Room, Ground Level, Grey Street.

Photography and Videography
All conference sessions and the exhibition are protected by international copyright laws. Photography and video/audio recording of any kind in conference sessions and the exhibition are prohibited without prior written permission by SPE.

Mobile Phone
As a courtesy to the speakers and your fellow attendees, please turn off all mobile phones during meetings and sessions.

Alcohol
We recognise that legitimate serving of alcohol beverages in the process of conducting business and social activities is acceptable. However, we also recognise that the use and consumption of alcohol carries the requirement for all attendees to consume these beverages responsibly and in keeping with our professional code of ethics and conduct. We strongly oppose the abuse and misuse of alcohol.

Consent to Use of Multimedia
Attendance or participation in URTeC events and other activities constitutes an agreement by the registrant to URTeC’s use and distribution of the registrant’s image or voice in promoting future URTeC events in any way URTeC deems appropriate.
Opening and Keynote Session

Monday, 18 November 2019 | 0900 - 0930 hours

Speakers

Andrew McConville
Chief Executive
Australian Petroleum Production & Exploration Association

Shauna Noonan
Director of Artificial Lift Engineering
Occidental Petroleum
2020 SPE President
Executive Plenary Session

Expanding Unconventionals – Making it Happen

Monday, 18 November 2019 | 0930 - 1030 hours

Boulevard B1-B3

Session Moderators

David Close
General Manager
Onshore New Ventures
Santos

Tom Blasingame
Professor
Texas A&M University

Speakers

Mark Fitzgerald
President and CEO
PETRONAS Canada

Rob Simpson
Vice President
CSG Development
Santos

Peter Lambert
Senior Expert
Oil and Gas
McKinsey & Company
Technical Plenary Session

Expanding Unconventionals – Making it Happen Technically in Asia Pacific

Monday, 18 November 2019 | 1100 - 1230 hours
Boulevard B1-B3

Session Moderators

Andrew Garnett
Director of the UQ Centre for Natural Gas
The University of Queensland Centre for Natural Gas

Raymond Johnson Jr.
Professor
The University of Queensland

Speakers

Scott Mildren
Solution Lead – Geomechanics Centre of Excellence
Ikon Science

Rick Lewis
Schlumberger Fellow
Unconventional Petrophysics
Schlumberger

John Hattner
Senior Vice President
Netherland, Sewell & Associates, Inc.

Bill Langin
General Manager
Upstream
Shell QGC
If we have learnt anything from the North American experience, unconventional resources cannot be exploited by small incremental projects. If we are to be successful in developing these types of reservoirs, we have to make project scale operations work to bring these resources to market in a timely manner.

A number of Eastern Hemisphere unconventional gas projects have raised interest, neared completion or are commencing deliveries. Success or failure of these projects have depended on successfully addressing key technical project management, political uncertainty and community issues. A panel of company representatives spanning experiences in various projects across the Eastern Hemisphere have been invited to share with the audience on how each of these projects they have been involved in fare in the "technical" metrics including:

- Scoping
- Cost management
- Scheduling and implementation; and
- Achieving defined business objectives

As well as sharing experiences relating to each panellist’s project, it is hoped that they can give their insight to future projects by addressing some important questions, such as the following:

- What are the main technical inhibitors to these projects and what are some of the ways to overcome them?
- What became the highest risk and capital cost driver, what is the impact, and how much subsurface definition is needed before committing to further development?
- How are we able to acquire and manage resources efficiently, in all senses of the word: people, materials, and services capacity?
- How do we ensure that the development accomplishes organisational business objectives?
- Do we have the project management skills and business climate required to ensure success of these projects at the current maturity of the unconventional market in the Eastern Hemisphere?

By bringing experienced technical managers currently involved in industry projects to the panel, we hope to generate fruitful discussions on key pre-requisites for delivering unconventional projects in the Eastern Hemisphere into the future.
Panel Sessions

Panel Session 2: CSG to LNG in Queensland – A Decade of Industry Learnings

Tuesday, 19 November 2019 | 1000 - 1230 hours

Panel Session 2: CSG to LNG in Queensland – A Decade of Industry Learnings

Panel Session 2: CSG to LNG in Queensland – A Decade of Industry Learnings

It is fitting that the first URTeC to be held outside of North America is being held in Queensland, Australia; home to the three of the largest (by most capital and production metrics) unconventional development projects outside of North America. Queensland’s projects are also the only to date where unconventional gas development has been used exclusively to underpin an LNG development.

Since reaching Final Investment Decisions (FID) nearly a decade ago, these three projects have drilled and brought online thousands of wells, and exported numerous cargoes of LNG. During this period, projects have moved on from “schedule focused” to “meet target first-gas dates” and finally, to “value focused” during the operate and sustain phase. Under intense regulatory, community, political and shareholder scrutiny, operators have made technical and operational gains to drive efficiencies and value while maintaining an outstanding track record of safety and environmental performance.

In this session, we have sought participation from operating companies and service or consulting firms to gain broad insights into the history and future of what are some of Australia’s biggest ever infrastructure projects.
Panel Sessions

Panel Session 3: Unconventional Gas and the Social License to Operate

Tuesday, 19 November 2019 | 1400 - 1530 hours

Session Moderators

Mark Stone
Executive Director
Department of Natural Resources
Mines and Energy (Queensland)

Katherine Witt
Research Fellow, The University of
Queensland Centre for Natural Gas

Speakers

Barry Goldstein
Executive Director
Energy Resources
Department for Energy and Mining,
State Government of South Australia

Vilas Tawde
Managing Director & CEO
Essar Oil & Gas Exploration and Production Ltd.

Colin Cassidy
Acting CEO
Gas Fields Commission
Queensland

Siti Sumilah Rita Susilawati
Head of Center for Mineral Coal and Geothermal Resources
Geological Agency of Indonesia
Ministry of Energy and Mineral Resources Indonesia

The International Energy Agency (WEO2017) suggest that global natural gas use is projected to rise by 1.6% pa to 2040 if policies already announced are implemented. This growth is concentrated in the Asia Pacific region. Gas trading will more than double by 2040 and 90% of the additional gas trade will be in the form of LNG. To fulfil this demand, it is suggested that almost one third of production may need to be unconventional, meaning, we need produce gas intensively near where people live, to cohabit land and not necessarily where people are used to having a gas facility in their communities.

The reason for this rising demand varies with location and jurisdiction and therefore the nature of the “social licence” can be expected to have a different flavour. We are already seeing gas demand rise from coal substitution in response to air quality concerns. We expect a massive growth in the need for gas as an industrial feedstock as regional economies continue to develop. Perhaps more importantly as population rises, we will see increased demand for gas fertilisers. The potential for methane to reduce greenhouse gas emissions in power generation has long been established. However, it is also critically dependant on our ability to supply fuel at costs competitive to coal.

There is a lot at stake if we do not get our social licence right for the places we produce.

In this session, we will explore experiences from operators and regulators to discuss the changing nature of social licence and possibly unforeseen, “knock-on” effects of the changing mode of production.
## Technical Programme

### Monday, 18 November

**Technical Session 1: CSG Drilling and Completions**

**Session Chairs:** Ted Bergman, *Arrow Energy*; Pankaj Bhavnani, *Shell*

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<thead>
<tr>
<th>Time</th>
<th>Paper #</th>
<th>Presentation</th>
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| 1400  | 198203  | Quantifying the Influence of Three Dimensionality on Hydraulic Fracturing in Coal Seam Gas Wells  
C.R. Leonardi, The U. of Queensland; T. Flottmann, Origin Energy; V.J. Pandey, ConocoPhillips; R. Johnson Jr., The U. of Queensland |
| 1420  | 198324  | Evaluating Performance of Graded Proppant Injection into CSG Reservoir: A Reservoir Simulation Study  
A. Ribeiro, The U of Queensland Centre for Natural Gas, Energi Simulation Research Fellow, The U. of Queensland; V. Santiago and Z. You, School of Chemical Engineering, The U. of Queensland; R. Johnson Jr., School of Chemical Engineering, The U. of Queensland Centre for Natural Gas for Natural Gas |
| 1440  | 198321  | Optimising Drilling Performance through Interburden and Basement Formations Utilising Adaptive Drill Bit Technology  
A. Shaban, M. Zaman, Santos Ltd.; S. Cornel, Baker Hughes |
| 1500  | 198325  | Deviated (Pad) Wells in Surat: Journey So Far  
A. Rajora, V. Sharma, M. Oberhardt, M. Lukyanov, E. Lim and S. Mazumder, Arrow Energy Ltd. |
## Technical Programme

### Monday, 18 November  
1400 – 1530 hours | Boulevard B2

**Technical Session 2: Faults, Fractures and (Micro) Seismicity**  
**Session Chairs:** Randall Taylor, *Taylor Exploration Consulting*; Dennis Cooke, *ZDAC Geophysical Technologies*

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<th>Time</th>
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| 1400  | 198283   | Well Stimulation Seismicity in Oklahoma: Cataloging Earthquakes Related to Hydraulic Fracturing  
J.E. Shemeta, MEQ Geo Inc.; C.E. Brooks and C.C. Lord, Oklahoma Corp. Commission |
| 1420  | 198222   | Focal Mechanism Determination and Stress Inversion for Induced Seismicity Related to Shale Gas Hydraulic Fracturing  
Y. Tan, U. of Science and Technology of China; J. Hu, Chengdu U. of Technology; Z. Zhao, U. of Queensland; L. Li, Central South U. |
| 1440  | 198212   | Case Study: Fault Slip Induced by Hydraulic Fracturing and Risk Assessment of Casing Deformation in the Sichuan Basin  
| 1500  | 198202   | Discrimination of Microseismicity Caused by Proppant Injection Using Microseismic Waveform Clustering: The Horn River Basin Case Study  
S. Ishikawa, N. Shimoda and H. Tokunaga, INPEX Corp. |
Technical Programme

Monday, 18 November  
1400 – 1530 hours | Boulevard B3

**Technical Session 3: Case Studies: Expanding Shale and Tight Gas Beyond North America**

**Session Chairs:** Hani Farouq Abul Khair, Consultant/Unconventional Geomechanics; Robert Fulks, Weatherford

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<th>Time</th>
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<tr>
<td>1400</td>
<td>198328</td>
<td><strong>Horizontal Completion Challenges in the Vaca Muerta Formation</strong></td>
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<td>R. Fulks, Weatherford</td>
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<tr>
<td>1420</td>
<td>198318</td>
<td><strong>How Not to Squander Billions on your Next Unconventional Venture</strong></td>
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<td></td>
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<td>C.D. Jenkins, M.A. McLane, Rose &amp; Associates, LLP</td>
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<tr>
<td>1440</td>
<td>198248</td>
<td><strong>Understanding the Complexity of Fracturing in the Sichuan Shale Gas Reservoir in China</strong></td>
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<td>Y. Liu and D. Kalinin, Schlumberger; D. Li, Y. Jiao and R. Li, PetroChina Zhejiang Oil Co.</td>
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<tr>
<td>1500</td>
<td>198290</td>
<td><strong>Descriptive Data Analytics for the Stimulation, Completion Activities, and Wells’ Productivity in the Marcellus Shale Play</strong></td>
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Monday, 18 November  
1600 – 1730 hours | Boulevard B2

**Technical Session 4: Evaluating Reservoir Quality in Shales and Coals**

**Session Chairs:** Thomas Neville, Asia-Pacific Formation Evaluation; Marcel Croon, Weatherford

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<tr>
<td>1600</td>
<td>198285</td>
<td><strong>Understanding Pore Structure of Mudrocks and Pore Size Dependent Sorption Mechanism Using Small Angle Neutron Scattering</strong></td>
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### Technical Programme

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<tr>
<th>Time</th>
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| 1620  | 198292  | **Customised Formation Evaluation Workflow and Production Prediction of a Shale Gas Reservoir: A Case Study in Huangjinba Block, China**  
X. Liang, G.C. Wang, L.W. Jiang, Y. Rui, Z. Zhang and J. Mei, PetroChina Zhejiang Oilfield Co.; Y. Wang, K.X. Li, X.R. Zhao, H.P. Zhao and F. Pan, Schlumberger |
| 1640  | 198211  | **In-situ Quantification of Adsorbed Gas in Coals Using Stimulated Diffusion Magnetic Resonance Measurements**  
B. Birt, K. O’Neill and T. Hopper, Qteq Pty. Ltd.; R. Ilett, Senex Energy |
| 1700  | 198316  | **Pore Size Distribution of Unconventional Rocks with Dual-wet Pore Network: A Sequential Spontaneous and Forced Imbibition Technique**  
M. Yassin, Y. Shi and H. Dehghanpour, U. of Alberta |

### Monday, 18 November  
1600 – 1730 hours  | Boulevard B3

#### Technical Session 5: Communicating External Opportunities and Risks

**Session Chairs:** Rod Bresnehan, CFT Holdings (HK); Nefeli Moridis, Texas A&M University

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| 1600  | 198314  | **Monitoring Socio-Economic Changes in Small Towns Affected by Large Scale CSG-LNG Development**  
K. Witt and J. Simpson, Centre for Natural Gas, The U. of Queensland |
| 1620  | 198209  | **Getting the Most from Public Domain Data**  
B. Gunn, I. Cockerill and J. Collins, RISC Advisory Pty. Ltd. |
| 1640  | 198220  | **The Unknown Risks of Fracking**  
D. Campin, Campin & Co. Pty. Ltd. |
| 1700  | 198195  | **Integrated Royalties Model to Promote the Exploration and Exploitation of Tight Reservoirs in North West of Peru**  
## Technical Programme

### Technical Session 6: CSG Reservoir Models

**Session Chairs:** Anne Oudinot, *Advanced Resources International, Inc*; Dan Kuznetsov, *Arrow Energy*

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| 0900  | 198205  | Development Performance of an Unconventional Coal Seam Gas Reservoir Using Integrated Reservoir and Production Modelling  
O. Abadie, TOTAL SA; M.R. Carrasco, IFP SCHOOL; N. Mottet, A. Gotti and R. Marmier, TOTAL SA  |
| 0920  | 198254  | Comparative Study of Coal Seam Gas Production Forecasting Methodologies: Detailed Analysis of Benefits and Drawbacks of Numerical Simulation, Analytical Models and a New Hybrid Approach  
I. Sugiarto and K. Zheng, Arrow Energy; S. Mazumder, Shell QC  |
| 0940  | 198276  | Development of Predictive Models in Support of Micro-particle Injection in Naturally Fractured Reservoirs  
Z. You, School of Chemical Engineering, The U. of Queensland; D. Wang and N. Di Vaira, School of Mechanical and Mining Engineering, The U. of Queensland; R. Johnson Jr., School of Chemical Engineering, The U. of Queensland Centre for Natural Gas; P. Bedrikovetsky, Australian School of Petroleum, The U. of Adelaide; C. Leonardi, School of Mechanical and Mining Engineering, The U. of Queensland Centre for Natural Gas  |
| 1000  | 198239  | Development and Evaluation of Multiphase Closure Models Used in the Simulation of Unconventional Wellbore Dynamics  

### Technical Session 7: Getting the Shale Geosciences Right

**Session Chairs:** Brownyn Camac, *Santos*; David Close, *Santos*; Rachel Kieft, *Senex Energy*

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| 0900  | 198221  | Improving Wellbore Placement Accuracy Using Stratigraphic Misfit Heatmaps  
## Technical Programme

### Technical Session 8: Stimulating the Deep, Hot, Tight Reservoirs

**Session Chairs:** Lucas Bazan, *Bazan Consulting, Inc.*; Sameer Ganpule, *Origin Energy*

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<th>Time</th>
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| 0900   | 198267   | **Successful Field Trials on Linear-Gel Fracturing with High-Strength Proppants in Deep Ultra-Tight Gas Wells in the Sultanate of Oman**  
| 0920   | 198307   | **Application of Novel Fracture Geometry Control Solution in Williston Basin**  
J.D. Estrada, K. Vidma, P. Abivin, C. Deng, A. Sharma and D. Kalinin, Schlumberger                                                                                                                                                                                                 |
| 0940   | 198275   | **A Comprehensive Workflow for Propagation Simulation and Structural Characterisation of Multiple Hydraulic Fractures in Naturally Fractured Unconventional Oil Reservoirs**  
L. Ren, Xi’an Shiyou U.; Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs; S. Zhan, U. of Alberta; China U. of Petroleum (East China); D. Zhou, Xi’an Shiyou U.; Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs; Y. Su and W. Wang, China U. of Petroleum (East China); M. Chen and C. Jing, Xi’an Shiyou U.; Shaanxi Key Laboratory of Advanced Stimulation Technology for Oil & Gas Reservoirs; J. Sun, Xi’an Shiyou U.; China U. of Petroleum (Beijing); K. Tang, China U. of Petroleum (Beijing) |
| 1000   | Invited Speaker | **The Gap between Expectation and Reality in Post-Fracture Tight-Gas Productivity: Geomechanics is the Missing Link**  
K. Rahman and F. Gui, Baker Hughes                                                                                                                                                                                                 |
## Technical Programme

### Tuesday, 19 November

### Technical Session 9: Geology of Coal: What Matters?

**Session Chairs:** Chris Mijnssen, *Arrow Energy*; Jim Underschultz, *Petroleum Hydrogeology International*

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<tr>
<td>1100</td>
<td>198304</td>
<td><strong>Resource Estimates of the Next Frontier: Deep Coals of the Cooper Basin</strong>&lt;br&gt; D. Warner, Deep Coal Technologies; C. Jenkins and J. Brown, Rose and Associates; T. McMahon, Cutlass Exploration</td>
</tr>
<tr>
<td>1120</td>
<td>198196</td>
<td><strong>Evaluation of Conservative Tracers for Coal Seam Reservoirs</strong>&lt;br&gt; D. Heryanto, L. Connell and N. Lupton, CSIRO Energy; J. Dun, CSIRO Land and Water; M. Camilleri, CSIRO Energy</td>
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<td>1200</td>
<td>198308</td>
<td><strong>Sequence Stratigraphy of Walloons-Springbok Sections: Different or Significantly Different?</strong>&lt;br&gt; I. Rodger, M. Reilly, Z. Hamerli, P. Hayes and S. Hurter, The U. of Queensland Centre for Natural Gas</td>
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### Technical Session 10: Production Data Analysis: A Reality Check

**Session Chairs:** Dilhan Ilk, *DeGolyer and MacNaughton*; Tom Blasingame, *Texas A&M University*

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<tr>
<td>1100</td>
<td>198311</td>
<td><strong>Analytical Model for History Matching Drawdown &amp; Buildup Cycles of Multi-Fractured Horizontal Wells Experiencing Multiple Operational Upsets</strong>&lt;br&gt; B. Yuan, Z. Zhang, C.R. Clarkson, S. Moghadam, H. Hamdi and A. Ghanizadeh, U. of Calgary</td>
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<tr>
<td>1120</td>
<td>198266</td>
<td><strong>A New Analytical Model for Production Forecasting in Unconventional Reservoir Considering the Simultaneous Matrix-fracture Flow</strong>&lt;br&gt; K. Qiu and H. Li, Peking U.</td>
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Technical Programme

Production Data Analysis in Complex Fracture Network Horizontal Wells with SRV Effects
Z. Chen, X. Tang, X. Liao, J. Wang, X. Zhang, J. Wu and H. Zhang, State Key Laboratory of Petroleum Resources and Prospecting, China University of Petroleum (Beijing)

Water Flowback RTA Analysis to Estimate Fracture Geometry and Rank the Shale Quality
A.F. Ibrahim, A. Assem, M. Ibrahim and C. Pieprzica, Apache Corp.

Tuesday, 19 November
1400 – 1530 hours | Boulevard B2

Technical Session 11: Assessing CSG Reservoir Properties
Session Chairs: George Koperna, Advance Resources International, Inc.; Buddy Woodroof, ProTechnics
Division of Core Laboratories

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<tr>
<td>1400</td>
<td>198260</td>
<td>A Stochastic Anisotropic Coal Permeability Model Using Mercury Intrusion Porosimetry (MIP) and Stress-strain Measurements</td>
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<td>S.S. Raza and V. Rudolph, The U. of Queensland School of Chemical Engineering &amp; The U. of Queensland Centre for Natural Gas; T. Rufford, The U. of Queensland School of Chemical Engineering; Z. Chen, The U. of Queensland School of Mechanical &amp; Mining Engineering</td>
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<td>1420</td>
<td>198264</td>
<td>A Coupled Pore-scale Modelling Approach to Capture Macro-scale Stress-dependent Permeability of Rocks</td>
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<td>1440</td>
<td>198327</td>
<td>The Impact of Cleat Connectivity on Coal Seam Gas Geomodels’ 3D Permeability</td>
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<td>R. Balucan and K. Steel, The U. of Queensland School of Chemical Engineering, The U. of Queensland Centre for Natural Gas</td>
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<td>1500</td>
<td>198297</td>
<td>Effect of Coal Surface Morphology on Transportation of Gases</td>
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<td>P. Naveen, R. Maddirala and K. Ojha, Indian Inst. of Technology (ISM) Dhanbad</td>
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### Technical Programme

**Tuesday, 19 November**

#### Technical Session 12: The Finer Details of Shale Stimulation and Production

**Session Chairs:** Ted Bergman, Arrow Energy; Daniel Kalinin, Schlumberger

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<tr>
<td>1400</td>
<td>198315</td>
<td><strong>Integrated Optimisation of Fracturing Design to Fully Unlock the Chang 7 Tight Oil Production Potential in Ordos Basin</strong>&lt;br&gt;K. Zhang, PetroChina Changqing Oil Co.; X. Zhuang, Schlumberger; M. Tang, PetroChina Changqing Oil Co.; L. Wang, Schlumberger; X. Bai, PetroChina Changqing Oil Co.; L. Wang, Schlumberger; S. Liu, PetroChina Changqing Oil Co.; X. Yang, Schlumberger</td>
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<tr>
<td>1420</td>
<td>198208</td>
<td><strong>The Impacts of Proppant Sorting and Dune Shape on Slickwater Hydraulic Fracturing Conductivity</strong>&lt;br&gt;J.L. Miskimins, Colorado School of Mines; M.A. Al-otaibi, Saudi Aramco</td>
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<td>1440</td>
<td>198207</td>
<td><strong>Refracturing Candidate Selection for Multi-fractured Horizontal Wells Using A New Hybrid Model in Tight Oil Reservoirs</strong>&lt;br&gt;J. Guo and L. Tao, State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, Southwest Petroleum U.; J. Zeng, The U. of Western Australia; N. He, PetroChina Sharing Service Xi’an Center, China</td>
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<tr>
<td>1500</td>
<td>198245</td>
<td><strong>Determination the Inflow Performance Relationship for Class II Methane Hydrate Deposits: A Quick Approach to Predict and Optimise Well Performance</strong>&lt;br&gt;N. Lu, J. Hou, Y. Liu, K. Zhou, Y. Bai and Y. Ji, China U. of Petroleum (East China); Q. Wang, U. of Calgary; B. Zhang, PetroChina Tarim Oil Co.</td>
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**Tuesday, 19 November**

#### Technical Session 13: Improving CSG Well Production

**Session Chairs:** Saikat Mazumder, Shell; Iain Rodger, The University of Queensland Centre for Natural Gas

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<tr>
<td>1600</td>
<td>198240</td>
<td><strong>Prediction of the Flowing Bottom-hole Pressure Using Advanced Data Analytics</strong>&lt;br&gt;M. Firouzi and S. Rathnayake, School of Chemical Engineering &amp; The U. of Queensland Centre for Natural Gas</td>
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| 1600  | 198226  | **What Comes Easy Won’t Last: Improved Dewatering Efficiency of Undersaturated Coal Reservoirs**  
J.P. Cardwell, Santos Ltd. |
| 1640  | 198281  | **Machine Learning for Progressive Cavity Pump Performance Analysis: A Coal Seam Gas Case Study**  
F. Saghir, M.E. Gonzalez Perdomo and P. Behrenbruch, U. of Adelaide |
| 1700  | 198282  | **Investigating the Effect of Salinity on Counter-current Two-phase Flow Regimes in Annuli**  
B. Wu, M. Firouzi, The U. of Queensland School of Chemical Engineering & The U. of Queensland Centre for Natural Gas; A.S. Ribeiro, The U. of Queensland Centre for Natural Gas; T.E. Rufford, B. Towler, The U. of Queensland School of Chemical Engineering & The U. of Queensland Centre for Natural Gas |

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### Tuesday, 19 November  
1600 – 1730 hours | Boulevard B2

#### Technical Session 14: Applying Geomechanics in a Stressed World

**Session Chairs:** Yongcun Feng, *China University of Petroleum*; Thomas Flottman, *Origin Energy*

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| 1600  | 198255  | **Using 3D Printed Synthetic Rock for Systematic Evaluation of Mechanical Properties in Coal**  
| 1620  | 198199  | **Significance of Rock Compositional Control on Geomechanical Properties and Hydraulic Fracturing of the Montney Formation, Western Canadian Basin**  
N. Vaisblat, A. Rangriz Shokri, K. Ayranci, N. Harris and R.J. Chalaturnyk, U. of Alberta |
| 1640  | 198271  | **A Coupled Geomechanics-reservoir Properties Workflow for Unconventional Play Landing Zone Optimisation**  
| 1700  | 198309  | **Stress Changes and Coal Failure Analysis in Coal Seam Gas Wells Accounting for Matrix Shrinkage: An Example from Bowen Basin, East Australia**  
M. Zare Reisabadi and M. Haghhighi, Australian School of Petroleum, U. of Adelaide; A. Khaksar, Baker Hughes |
# Technical Programme

## Tuesday, 19 November

**Technical Session 15: Modelling All Things Big and Small in Shales**

**Session Chairs:** Sameer Ganpule, Origin Energy; Raymond Johnson Jr., The University of Queensland

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<tr>
<td>1600</td>
<td>198303</td>
<td><strong>Characterising Gas Transfer from the Inorganic Matrix and Kerogen to Fracture Networks: A Comprehensive Analytical Modelling Approach</strong>&lt;br&gt;J. Zeng, J. Liu, W. Li, L. Li, Y. Leong, The U. of Western Australia; D. Elsworth, Pennsylvania State U.; J. Guo, Southwest Petroleum U.</td>
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<tr>
<td>1640</td>
<td>198246</td>
<td><strong>Quantitative Investigation of the Water-sensitivity Damage on Ultra-low Permeability Reservoir</strong>&lt;br&gt;J. Li, B. Tu, MOE Key Laboratory of Petroleum Engineering, China U. of Petroleum; W. Li, Inst. of CNOOC Shenzhen Branch; Y. Li, Harold Vance Department of Petroleum Engineering, Texas A&amp;M U.</td>
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<tr>
<td>1700</td>
<td>198261</td>
<td><strong>Characterisation of Reservoir Pressure and Temperature Impact on Diffusion Behaviour of Beetaloo Basin Shales</strong>&lt;br&gt;N. Lupton, R. Sander, M. Camilleri, Z. Pan and L. Connell, CSIRO</td>
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# Knowledge Sharing ePosters

During the ePoster session, presenters will deliver their presentations in an informal setting and facilitate direct discussions with attendees at designated ePoster stations. Attendees are encouraged to attend the sessions for more knowledge sharing and networking opportunities. ePosters are also available for attendees’ viewing at ePoster stations throughout the conference.

### Monday, 18 November

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| 1030  | 198274  | **Novel Coalbed Methane Reservoir Permeability and Reserve Evaluation Method Based on Flowing Material Balance Equaotion at Dewatering Stage Considering Permeability Variation**  
J. Shi and J. Wu, China U. of Petroleum (Beijing); T. Zhang, China U. of Petroleum (Beijing), The U.of Texas at Austin; Z. Sun, Y. Jia, Y. Fang and X. Li, China U. of Petroleum (Beijing) |                     |
| 1300  | 198313  | **Multi-scale Assessment of Plasticity of Deep Organic-rich Shale: From Core Scale to Mineral Scale**  
M. Sheng, State Key Laboratory of Petroleum Resources and Prospecting, China U. of Petroleum-Beijing; National; W. Khan, S. Cheng and P. Zhang, China U. of Petroleum-Beijing; S. Tian and Q. Xu, State Key Laboratory of Petroleum Resources and Prospecting, China U. of Petroleum-Beijing |                     |
| 1330  | 198298  | **Mineral Cracking and Porosity Enhancement of Shale through Acidising**  
M. Sheng, State Key Laboratory of Petroleum Resources and Prospecting, China U. of Petroleum-Beijing; National; W. Khan, S. Cheng and P. Zhang, China U. of Petroleum-Beijing; S. Tian and Q. Xu, State Key Laboratory of Petroleum Resources and Prospecting, China U. of Petroleum-Beijing  
*(Alternate paper in Technical Session 12)* |                     |
| 1530  | 198215  | **Fault and Fracture Prediction of Tight Gas Reservoir Based on Seismic Likelihood Attribute**  
M. Li, T. Duan and H. Zhao, SINOPEC Exploration & Production Research Inst.  
*(Alternate Paper in Technical Session 2)* |                     |
| 1030  | 198288  | **Using Machine Learning Methods to Identify Coals from Drilling and Logging-while-drilling (LWD) Data**  
R. Zhong, R. Johnson Jr. and Z. Chen, The U. of Queensland  
*(Alternate Paper in Technical Session 1)* |                     |
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<td><strong>Production Performance Evaluation from Stimulation and Completion Parameters in the Permian Basin: Data Mining Approach</strong>&lt;br&gt;M.A. Al-Alwani and S. Dunn-Norman, Missouri U. of Science and Technology; L.K. Britt, NSI Fracturing; H.H. Alkinani and A.T. Al-Hameedi, Missouri U. of Science and Technology; A.M. Al-Attar, Enterprise Products, Houston, TX, USA; H.A. Trevino, Missouri U. of Science and Technology; W.H. Al-Bazzaz, Kuwait Inst. for Scientific Research</td>
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<td>1330</td>
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<td><strong>Fast Marching Method Based Rapid Simulation Accounting for Gravity</strong>&lt;br&gt;T. Onishi, Texas A&amp;M U.; A. Lino, INPEX Corp.; H.Y. Jung and A. Datta-gupta, Texas A&amp;M U.</td>
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<td>1530</td>
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<td><strong>Smart Midstream Integration for CSG to LNG</strong>&lt;br&gt;R.K. Byfield, Yokogawa</td>
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<td><strong>Tracking Procedures for Reserves and Resources Other than Reserves (ROTR) for Internal Reporting Processes</strong>&lt;br&gt;N. Moridis and J. Lee, Texas A&amp;M U.; W. Sim, Aucerna; T. Blasingame, Texas A&amp;M U. <em>(Alternate paper in Technical Session 5)</em></td>
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<td><strong>Mitigating the Risk: An Analysis of Well Integrity Regulation in Queensland</strong>&lt;br&gt;<strong>Unconventional Oil and Gas Developments and Associated Assurance Activities</strong>&lt;br&gt;T. Thomas, The U. of Queensland&lt;br&gt;<em>(Alternate Paper in Technical Session 5)</em></td>
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<td><strong>Breakthrough Shale Gas Exploration in the Wufeng-Gaojiabian Formation, Lower Yangtze Area, China</strong>&lt;br&gt;S.Z. Li, China Geological Survey; Y. Wang, Schlumberger; X. Liu, China Geological Survey; X.R. Zhao and H. Zhao, Schlumberger; L. Xu, GeoReservoir Research&lt;br&gt;<em>(Alternate Paper in Technical Session 3)</em></td>
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<td><strong>Spectral Decomposition of the Heterogeneous Springbok Sandstone and Walloon Coal Measures in the Surat Basin, Australia</strong>&lt;br&gt;Z. Hamerli, M. Reilly and S. Hurter, Centre for Coal Seam Gas, U. of Queensland&lt;br&gt;<em>(Alternate Paper in Technical Session 2)</em></td>
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<td>1530</td>
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<td><strong>Caliper Behind Casing: Using Nuclear Logging Tools to Replicate Openhole Caliper Measurements in Cased Holes</strong>&lt;br&gt;B. Clarricoates and M. Lang, Weatherford&lt;br&gt;<em>(Alternate Paper in Technical Session 4)</em></td>
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<td><strong>Dynamic Non-darcy Flow Compositional Numerical Simulation for CO2 Huff-n-puff Development in Tight Oil Reservoir</strong>&lt;br&gt;Q. Wang, R. Jiang, Y. Cui and X. Jianchun, China U. of Petroleum (East China); G. Liu, CNOOC EnerTech-Drilling &amp; Production Co., Tianjin, China</td>
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<td><strong>Integrated Workflow for Optimising Stimulation Design of a Mulitwell Pad in Unconventional Reservoirs</strong>&lt;br&gt;Y. Wei, J. Wang, A. Jia and Y. Qi, Research Inst. of Petroleum Exploration and Development; C. Liu, Petrochina Zhejiang Oilfield Co.</td>
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<td><strong>An Alternative BEM Modelling of Transient Pressure Response of Fractured Reservoir by Use of a Semi-analytical Approach</strong>&lt;br&gt;J. Wang, A. Jia, Y. Wei and Y. Qi, Research Inst. of Petroleum Exploration and Development&lt;br&gt;<em>(Alternate Paper in Technical Session 10)</em></td>
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<td><strong>Sedimentary Geochemical Record of the Middle Mesoproterozoic: Early Neoproterozoic Tectonic Geography of Northern Australia</strong>&lt;br&gt;B. Yang, A. Collins and M. Blades, U. of Adelaide</td>
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| 1030   | 198231  | Upscaled Gas and Water Relative Permeability from Pore and Core Scale Experimental Data Over Hydraulic Fracturing, Flowback and Online Production  
D. Wang, China U. of Petroleum (East China), U. of Calgary; J. Yao, China U. of Petroleum (East China); Z. Chen, U. of Calgary; W. Song, H. Sun and M. Cai, China U. of Petroleum (East China); B. Yuan, U. of Calgary | 6         |
| 1300   | 198280  | Petrophysical Evaluation of Organic Richness and Brittleness of Shale for Unconventional Hydrocarbon Prospecting: A Case Study on Vadaparru Shale, Krishna Godavari Basin, India  
A. Sahu and M.K. Das, Oil and Natural Gas Corp. Ltd.  
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| 1330   | 198273  | Pressure Transient Behaviour of Unconventional Reservoirs: Combined Effect of Spatial Variation and Stress-dependence on Permeability  
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| 1300   | 198277  | Evaluation of Wettability Variation of Gas Shales by Drop Shape Analysis Approach  
H. Sharifigaliuk, S.M. Mahmood and E. Padmanabhan, U. Teknologi PETRONAS  
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<td><strong>Applicability Evaluation of SRV Concept in Tight and Shale Reservoirs via Large-scale Rock Block Experiments</strong>&lt;br&gt;S. Li, X. Wang, C. He, T. Liang and H. Fu, Research Inst. of Petroleum Exploration and Development, PetroChina&lt;br&gt;(Alternate Paper in Technical Session 12)</td>
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<td><strong>3D Discrete Natural Fracture Networks and Fracture Reactivation Potential Assessment in the Longmaxi Shale</strong>&lt;br&gt;C. Bian and D. Zhang, Sinopec Exploration &amp; Production Research Inst.; F. Shen, GeoReservoir Research; Y. Wo and W. Sun, Sinopec Exploration &amp; Production Research Inst.; J. Li, J. Han and S. Li, GeoReservoir Research; Q. Ma, Sinopec Exploration &amp; Production Research Inst.&lt;br&gt;(Alternate paper in Technical Session 7)</td>
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<td><strong>Fracture Induced Stress Measurement and Evaluation Considering Influence of Complex Natural Fracture</strong>&lt;br&gt;X. Chen, Y. Li and F. He, Chuanqing Drilling Engineering Co. Ltd., CNPC&lt;br&gt;(Alternate Paper in Technical Session 14)</td>
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<td><strong>Assessment of Fault Zone Properties for CSG Development Areas</strong>&lt;br&gt;J. Underschultz, S. Mukherjee, A. Wolhuter, H. Xu and E. Banks, U. of Queensland; S. Noorduijn, Flinders U.; J. McCallum, U. of Western Australia&lt;br&gt;(Alternate Paper in Technical Session 9)</td>
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<td><strong>Swelling Inhibition of Bentonite Clay by Mg(OH)2 Precipitation Using Different Mg Salts</strong>&lt;br&gt;A. Patel, B. Towler, V. Rudolph and T. Rufford, U. of Queensland&lt;br&gt;(Alternate Paper in Technical Session 13)</td>
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<td><strong>Modelling the Contribution of Individual Seams to Coal Seam Gas Production</strong>&lt;br&gt;V. Santiago, The U. of Queensland School of Chemical Engineering; A. Ribeiro and S. Hurter, The U. of Queensland Centre for Natural Gas&lt;br&gt;(Alternate Paper in Technical Session 6)</td>
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<td><strong>Developing Coal Bed Methane (CBM) Project as a Truly Sustainable Venture: Strategies, Technologies and Methodologies</strong>&lt;br&gt;V. Tawde, I. Chellani and R. Sharma, Essar Oil and Gas Exploration and Production Ltd.&lt;br&gt;(Alternate Paper in Technical Session 5)</td>
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<td><strong>Pressure Analysis for Volume Fracturing Well in Tight Reservoirs Considering Dynamic Threshold Pressure Gradient and Stress Sensitivity</strong>&lt;br&gt;Z. Wu, College of Petroleum Engineering, China U. of Petroleum (East China) &amp; School of Mining and Petroleum; C. Cui, College of Petroleum Engineering, China U. of Petroleum (East China); X. Cheng, Petrochina Research Inst. of Petroleum Exploration &amp; Development; Z. Wang and Y. Sui, College of Petroleum Engineering, China U. of Petroleum (East China); X. Zhao, China U. of Petroleum (East China)</td>
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<td><strong>Trends in Seismicity in the CSG Producing Region of the Surat Basin in Queensland</strong></td>
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<td>D. Weatherley, The U. of Queensland Sustainable Minerals Inst.; A. Garnett, The U. of Queensland Centre for Natural Gas</td>
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<td><strong>Optimising the Dispersion of Coal Fines Using Sodium Dodecyl Benzene Sulfonate</strong></td>
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<td><strong>Optimisation of Dewatering Rates to Maximise Coal Seam Gas Production</strong></td>
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<td>C. Khan, U. of Queensland; D. Kuznetsov, Arrow Energy Ltd.; T. Rufford, V. Rudolph and Z. Chen, U. of Queensland</td>
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<td><strong>A Very Unconventional Hydrocarbon Play: The Mesoproterozoic Velkerri Formation of Northern Australia</strong></td>
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<td>A. Collins and M. Blades, The U. of Adelaide; A. Jarrett, Geoscience Australia</td>
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<td><strong>A Multiproxy Characterisation of Shale Brittleness in the Isa Superbasin, Northern Australia</strong></td>
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<td><strong>CoalThickness Modelling Across a Regional CBM Project: An Amended Workflow</strong>&lt;br&gt;S. Beaney, M. Jeffries and S. Mazumder, Arrow Energy Ltd.&lt;br&gt;(Alternate Paper in Technical Session 9)</td>
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<td><strong>Geochemical Interpretation of Flowback Fluids to Assess Fracking Efficiency and Reservoir Compartmentalisation</strong>&lt;br&gt;P. Birkle and G.K. Makechnie, Saudi Aramco&lt;br&gt;(Alternate Paper in Technical Session 7)</td>
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<td><strong>Probing the Characteristics of Adsorption and Diffusion of CO2, CH4 and their Mixture on Kerogen Slit Using Molecular Simulation</strong>&lt;br&gt;W. Zeng, PetroChina Coalbed Methane Co.; Q. Sun, Petroleum Engineering, Texas A&amp;M U. at Qatar; L. Zhou, PetroChina Southwest Oil and Gasfield Co.; Y. Wang, Petroleum Engineering, Texas A&amp;M U. at Qatar</td>
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<td><strong>A New Dynamic Apparent Permeability Model for Gas Flow in Microfractures of Shale</strong>&lt;br&gt;Y. Li, China U. of Petroleum, The U. of Kansas; P. Dong, China U. of Petroleum (Beijing); D. Zhou, China U. of Petroleum (Beijing), Colorado School of Mines</td>
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NERA Innovation Session

Monday, 18 November

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<td>XDR Workover Rigs</td>
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<td>Michael Ilett, Exploration Drill Rigs Pty. Ltd.</td>
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<td>New Geostatistics to Model Heterogeneity - The Copula Plug-In</td>
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<td>Sebastian Hörning, University of Queensland, Centre for Natural Gas, Energi Simulation</td>
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<td>Enhancing Well Deliverability</td>
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<td>Multilimbed Inspection Robot</td>
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<td>Robots, Automation and the Future of Unconventionals</td>
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<td>Jeff Sterling, Universal Field Robots</td>
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<td>1815</td>
<td>Obzervr: Field to Boardroom Fieldwork Mobility and Analytics Platform</td>
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<td>Tania Walter, Obzervr</td>
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<td>Joe Hoolahan, JESI Management Solutions</td>
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<td>Quick Safety - Safety for everyone!</td>
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<td>Kurt Alexander, Quick Safety</td>
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<td>1815</td>
<td>Gaming technology for 3D Visualisation and Digital Twins</td>
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<td>Scott Dumaresq, Sentient Computing</td>
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<td>Data Fusion and Machine Learning applied to Coal Seam Gas Development</td>
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Training Courses

Post-Conference Training Course
Wednesday, 20 November 2019 • 0900 – 1800 • Bastille 1, Sofitel Brisbane Central

SPE Training Course:
Mastering Uncertainty and Risk in Unconventional Reservoir Assessment (Shale, Coals, Tight Sandstones & Carbonates)

Instructor: Creties Jenkins, Partner, Rose and Associates

Course Synopsis

This one-day course provides a robust framework for assessing uncertainty and risk in unconventional projects. It begins by summarizing the key discipline-specific workflows and work products needed to characterize your project. It then introduces 1) statistics as a basis for applying probabilistic techniques, 2) approaches for estimating key parameters under uncertainty, and 3) techniques to mitigate bias in your work. The course then turns to using aggregation and its derivative products (trumpet plots, confidence curves, and sequential aggregation plots) to quantify the optimal number of appraisal wells and track your drilling progress. The course concludes by applying what’s been learned within a staged approach in order to expose capital incrementally and make good decisions along the way about whether to continue funding the project. Geoscientists, engineers, commercial team members, business analysts, and managers will all benefit from this course.

Instructor Biography

Creties D. Jenkins (P.E., P.G.) has over 30 years of industry experience, having worked for Tenneco, ARCO, and DeGolyer & MacNaughton before joining Rose and Associates in 2013. He specializes in the characterization of unconventional reservoirs, including tight sandstones and carbonates, shales, and coals. Creties has conducted integrated studies, peer reviews, resource assessment work and training for more than 50 companies around the world. He has also conducted more than 100 industry courses and workshops over the past decade focused on the exploration, appraisal, and development of tight oil and gas reservoirs. Creties has served as a technical editor, distinguished lecturer, and distinguished author for SPE and is a recent recipient of AAPG’s Distinguished Service Award. He is a co-author of SPEE Monograph 4: Estimating Ultimate Recovery of Developed Wells in Low-Permeability Reservoirs (2016) and led the 2017 Multi-disciplinary Summit: Building and Applying the Universal Workflow for Low Permeability Oil and Gas Reservoirs. Creties received a BSc in Geological Engineering and a MSc in Geology from the South Dakota School of Mines. He is a partner in Rose & Associates, LLP.
Training Courses

AAPG Training Course:
Volumetric Analysis of Shale Reservoirs

**Instructor:** Reza Rezaee, Professor, Curtin University

**Course Synopsis**

Volumetric analysis of shale reservoirs is of prime importance in oil and gas industry. This course practically elaborates how different shale petrophysical parameters such as porosity, fluid saturation, and adsorbed gas, which are essential for volumetric analysis of shale reservoirs, can be estimated using well-log data. The major goal of the course is to show attendees how different shale petrophysical parameters such as porosity, fluid saturation, and adsorbed gas can be estimated. These petrophysical parameters are essential for volumetric analysis of shale reservoirs.

**Instructor Biography**

Professor Reza Rezaee of Curtin’s Department of Petroleum Engineering has a PhD degree in Reservoir Characterization. He has over 27 years’ experience in academia being responsible for both teaching and research. During his career he has been engaged in several research projects supported by major oil and gas companies and these commissions, together with his supervisory work at various universities, have involved a wide range of achievements. During his research career he has led several major research projects funded by various oil and gas companies. He has received a total of more than $2.2M funds through his collaborative research projects. He has supervised over 70 M.Sc. and PhD students during his university career to date. He has published more than 160 peer-reviewed journal and conference papers and is the author of 4 books on petroleum geology, logging and log interpretation and gas shale reservoirs. His research has been mostly on integrated solutions for reservoir characterization, formation evaluation and petrophysics. Currently, he is focused on unconventional gas including gas shale and tight gas sand studies. As a founder of “Unconventional Gas Research Group” of Australia, he has established a unique and highly sophisticated research lab at the Department of Petroleum Engineering, Curtin University. This lab was established to conduct research on petrophysical evaluation of tight gas sands and shale gas formations. He is the winner of Australian Gas Innovation Award for his innovation on tight gas sand treatment for gas production enhancement.
There is a growing trend towards the use of statistical modeling and data analytics for analyzing the performance of petroleum reservoirs. The goal is to “mine the data” and develop data-driven insights to understand and optimize reservoir response. The process involves: (1) acquiring and managing data in large volumes, of different varieties, and at high velocities, and (2) using statistical techniques to discover hidden patterns of association and relationships in these large, complex, multivariate datasets. However, the subject remains a mystery to most petroleum engineers and geoscientists because of the statistics-heavy jargon and the use of complex algorithms.

This training course will provide an introduction to statistical modeling and data analytics for reservoir performance analysis by focusing on: (a) easy-to-understand descriptions of the commonly-used concepts and techniques, and (b) case studies demonstrating the value-added proposition for these methods. Participants are encouraged to bring their own laptops to follow along the exercises in the workshop.

Instructor Biography

Dr. Srikanta Mishra is an Institute Fellow and Chief Scientist (Energy) at Battelle Memorial Institute, the world’s largest independent contract R&D organization. He is responsible for developing and managing a geoscience-oriented technology portfolio related to computational modeling and data analytics for geological carbon storage, shale gas development, and improved oil recovery projects. Dr. Mishra has taught short courses on statistical modeling, data analytics, and uncertainty quantification at various professional conferences and client locations in the US, China, Spain, Japan, Finland, Belgium, Switzerland, and India. He is the author of “Applied Statistical Modeling and Data Analytics for the Petroleum Geosciences” recently published by Elsevier, as well as ~200 technical publications. Dr. Mishra also serves as an SPE Distinguished Lecturer for 2018-19 on “Big Data Analytics: What Can It Do for Petroleum Engineers and Geoscientists”. He holds a PhD degree from Stanford University, an MS degree from University of Texas, and a BTech degree from Indian School of Mines – all in Petroleum Engineering.
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Exhibition Floor Plan

Boulevard Room, Boulevard Level (Grey Street)
Brisbane Convention & Exhibition Centre (BCEC)
Exhibitor Profiles

AJ Lucas Services Pty Ltd – Booth S04
Level 2, 17-19 Bridge Street, Sydney NSW 2000 Australia
Tel: +61 413 616661
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Website: www.lucons.com.au

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Tel: 1 800 364 2274
Email: apereira@aapg.org
Website: http://www.aapg.org

AAPG is the world’s premier professional association for geoscientists and provides the network of communications that allows those professionals to succeed. AAPG’s membership is made up of nearly 25,000 members across the globe, and is headquartered in Tulsa with regional offices in London, Dubai, Singapore, Bogota and Lagos. AAPG is sponsoring society of URTeC 2020, to be held in Austin, Texas, USA, from 20-22 July.

Apergy Artificial Lift – Booth A04
Tenancy 3, Building 1, 261 Gooderham Road, Willawong Queensland 4110 Australia
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**www.kappaeng.com**

KAPPA is an upstream petroleum engineering software, training and consulting company specialised in the field of Dynamic Data Analysis. KAPPA develops and markets the industry standard Saphir (PTA), Emeraude (PL) software and has integrated workflows for handling PDGs and Unconventional Resources.

**NERA (National Energy Resources Australia) – Booth B03**
26 Dick Perry Avenue, Kensington Western Australia 6151 Australia  
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**Pro-Test Well Services Pty Ltd – Booth S02**
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Society of Exploration Geophysicists – Booth K1
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T: +1 918 497 5500
E: support@seg.org
www.seg.org

SEG is committed to advancing the science of geophysics. With more than 14,000 members in 114 countries, SEG provides educational resources to the global geosciences community through publications, books, events, forums, professional development courses, young professional programs, and more. SEG has satellite offices in Houston, Dubai, Beijing, and Kuala Lumpur.

Society of Petroleum Engineers (SPE) – Booth K3
Suite 12.01, Level 12, Menara IGB, Mid Valley City, Lingkaran Syed Putra, 59200 Kuala Lumpur Malaysia
T: +60 3 2182 3000
F: +60 3 2182 3030
E: spekl@spe.org
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The Society of Petroleum Engineers (SPE) is a not-for-profit professional association whose more than 156,000 members in 154 countries are engaged in oil and gas exploration and production. SPE is a key resource for technical knowledge providing publications, events, training course and online resources at www.spe.org.

The University of Queensland Centre for Natural Gas – Booth B03
Sir James Foots Building, level 8, St Lucia Qld 4072 Australia
T: +61 7 3346 4101
E: ccsg@uq.edu.au
https://ccsg.centre.uq.edu.au/

The UQ Centre for Natural Gas is a centre of research excellence. It conducts real-world research focussed on optimising Australia’s natural gas industry terms of environmental performance, social performance, and optimisation of cost of operation and supply. The Centre’s research portfolio spans the areas of geoscience, petroleum engineering, water and social performance.
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