

EAGE

EUROPEAN
ASSOCIATION OF
GEOSCIENTISTS &
ENGINEERS

أدنوك
ADNOC



EAGE Workshop on 4D Seismic and Reservoir Monitoring

BRIDGE FROM KNOWN TO UNKNOWN

18-20 NOVEMBER 2018 • ABU DHABI, UAE

- **FINAL ANNOUNCEMENT & TECHNICAL PROGRAMME**

WWW.EAGE.ORG

TECHNICAL COMMITTEE

Andrey Bakulin co-chair	Saudi Aramco
Andrea Grandi co-chair	ADNOC Onshore
Anubрати Mukherjee	WesternGeco/SLB
Yousuf Al Jabri	PDO
Beth Rees	CGG
Michel Kemper	IKON
Raed El-Awawdeh	ExxonMobil

WORKSHOP OVERVIEW

Optimizing recovery remains a critical task for any operator, irrespective of their location around the globe. Advances in sensors, compute power and artificial intelligence provide fertile ground for new areas of improvement. Realizing the potential of all these new powers requires an integrated effort, often beyond what can be done in the past or by a single operator or provider. Such advances require novel ideas and unconventional alliances to implement them. While other industries have greatly benefited from crowdsourcing and breaking barriers, the oil and gas industry has long way to go in this area, as well as in finding ways to efficiently coalesce together multiple elements of the existing ecosystem of large and small operators and vendors in the complex area of reservoir monitoring. We invite practitioners, innovators and dealmakers to come to this workshop to share their achievements and challenges, lay out big innovative ideas and seek new alliances to break into unknown territory.

Most 4D achievements are associated with offshore scenarios and clastic reservoirs. By 2030, the IEA estimates that more than 60% of daily production will come from onshore fields, which are dominated by carbonate reservoirs. In addition, the role of unconventional reservoirs is growing in importance and yet the use of proven geophysical techniques remains very limited in these fields.

One thing we have learned over twenty years of 4D monitoring is that reservoirs are too complex to be described by the super-simple physics and models we would like them to fit into. With the emerging power of artificial intelligence, we can try from other directions to conquer this territory of yet unknown physics and see if we can make new models work.

Bring your knowledge, ideas and passion and join us in this workshop to explore the current landscape of reservoir monitoring and spearhead new directions not discovered before!

KEYNOTE SPEAKERS

Thierry Coleou

Thierry Coléou has a PhD in Geostatistics from the Ecole des Mines de Paris. After 5 years in the mining industry, he joined in 1988 the Compagnie Générale de Géophysique, now CGGVeritas. Based in Houston, then in Stavanger and London, he has been back in France since 2003 in the R & D department in tank characterization.

TECHNICAL PROGRAMME

Oral presentations | Sunday 18 November

MEETING ROOM	
08:30	Opening Remarks - HSE
08:35	Welcome & Aims by Chairmen
08:45	KND01: Keynote Speaker
Best Practices in Clastics A. Bakulin (Saudi Aramco) & C. Macbeth (Heriot-Watt University)	
09:15	4DS01: Quantitative Interpretation of a Time-lapse Seismic for Steam Injection Monitoring in a Heavy Oil Reservoir - M. Paydayesh* (Schlumberger), A. Murineddu (Schlumberger), A. Mukherjee (Schlumberger), C. Koeninger (Schlumberger)
09:40	4DS02: A 4D Pre-Stack Time-Shift Study to Evaluate Overburden Changes in a HPHT Clastic Field - I. Dvorak* (Heriot-Watt University), C. MacBeth (Heriot-Watt University)
10:05	4DS03: Towards Facies-based 4D Seismic Inversion - M. Kemper* (IKON Science)
10:30	Coffee Break
11:00	4DS04: Automated Integration of 4D Seismic Into Simulation Model History Matching - S. Fowler (BP), T. Hance (BP), L. Hodgson (BP), M. Ball (BP), B. Davies (BP), M. Le Good (BP), K. Tough* (BP)
11:25	Discussion Time
12:05	Lunch Break
4D Processing A. Mukherjeetake (Schlumberger) & R. Smith (Saudi Aramco)	
13:00	4DS05: Critical Time-Lapse Processing Steps for Successful Monitoring of Carbonate Reservoirs in a Desert Environment - E. Hemyari (Saudi Aramco), R. Smith (Saudi Aramco), K. Erikson (Saudi Aramco), A. Bakulin (Saudi Aramco), A. Alramadhan* (Saudi Aramco)
13:25	4DS06: Optimising Processing Workflows For 4D Time Lapse Land Seismic - D. Skorinski* (Schlumberger), P. Marsden (Schlumberger), P. Leung (Schlumberger), A. Glushchenko (Schlumberger)
13:50	4DS07: Simultaneous Joint Migration Inversion Applied to the Time-lapse Field Datasets From the Troll Field - S. Qu* (Delft), D.J. Verschuur (Delft)
14:15	Coffee Break
14:45	4DS08: Shedding New Light on the 4D Illumination Problem - H. Hoerber* (CGG)
15:10	Discussion Time
EM, Gravity, INSAR D. Colombo (Saudi Aramco) & A. Tura (Colorado School of Mines) - PART 1	
15:50	4DS09: Surface Gravity and Subsidence as Complementary Monitor Data to Reservoir Pressures and 4D Seismic - O. Eiken* (Quad Geometrics Norway AS)
16:15	4DS10: Steamfront Detection Using Time-lapse Micro-Gravity Inversion - A. Lazki (Petroleum Development Oman), A. Ismaili (Petroleum Development Oman), J.G.F. Stammeijer* (Petroleum Development Oman), M. Hamm (Petroleum Development Oman)
16:40	Discussion Time
17:00	End of Day 1
17:30	Icebreaker Reception

Oral presentations | Monday 19 November

MEETING ROOM	
08:30	Introduction to Day 2 by Chairmen
08:40	KND02: Keynote Speaker: C. Hubans (Total)
Explore Emerging Territories: Carbonates R. El-Awawdeh (ExxonMobil) & A. Grandi (ADNOC Onshore)	
09:10	4DS11: Frequent Time-Lapse Seismic Monitoring with Permanently Buried Receivers in Desert Environment - A. Bakulin* (Saudi Aramco), R. Smith (Saudi Aramco), P. Nivlet (Saudi Aramco), M. Jervis (Saudi Aramco)
09:35	4DS12: Learnings and Challenges of Carbonate Reservoir Geophysical Fluid Monitoring from Giant Onshore and Offshore Oil Fields in Middle East - R. El-Awawdeh* (ExxonMobil), J. Zhang (ExxonMobil), L. Yose (ExxonMobil), A. Modavi (ExxonMobil)
10:00	Coffee Break
10:30	4DS13: Reviewing Reservoir Performances of a Giant and Mature Carbonate Field Through Time Lapse Data - A. Grandi* (ADNOC Onshore), S. Singhal (ADNOC Onshore), G. Latchimy (ADNOC Onshore), A. Al Khoori (ADNOC Onshore), M. Al Jenaibi (ADNOC Onshore - TC (SS&DM)), C. Hubans (Total)
10:55	4DS14: Time-Lapse Seismic Feasibility Tests For Monitoring of Carbonate Reservoirs in a Desert Environment - A. Bakulin (Saudi Aramco), M. Jervis (Saudi Aramco), R. Smith* (Saudi Aramco)
11:20	Discussion Time
12:00	Lunch Break
Poster Session	
13:00	POD01: Large-Scale Imaging of Microseismic Events Recorded at a Field in Oman - Q. Al-Siyabi* (Petroleum Development Oman)
	POD02: Metaheuristic Optimization of Small Data in 4D Seismic to Simulation - T. Ramsay* (Halliburton)
Borehole Seismic R. El-Awawdeh (ExxonMobil) & Y. Al Jabri (PDO)	
13:30	4DS15: High-Resolution Time-Lapse Cross-Well Full Waveform Inversion for Successful EOR Monitoring in the Middle East - Y. Nakamura* (JOGMEC), A. Kato (JOGMEC), M. Nakatsukasa (JOGMEC), T. Mouri (JOGMEC), M. Takanashi (JOGMEC), R. Kamei (University of Western Australia), D. Lumley (University of Texas), U.G. Jang (Korean Polar Research Institute)
13:55	4DS16: Time Lapse Seismic Monitoring of Individual Hydraulic Frac Stages Using a Downhole DAS Array: Theoretical Findings and Full Wavefield Modeling - G. Binder (Colorado School of Mines), A. Titov (Colorado School of Mines), D. Tamayo (Colorado School of Mines), J. Simmons (Colorado School of Mines), A. Tura* (Colorado School of Mines), G. Byerley (Apache Corporation), D. Monk (Apache Corporation)
14:20	4DS17: Repeatability in DAS Seismic Measurements: Assessing Fiber Optic Technology for 4D Analysis - A. Chavarria* (Optasense)
14:45	Coffee Break
15:15	4DS18: Assessment of Quality and Repeatability of VSP Data Acquired by Combining DAS and Permanent Rotary Source at the Aquistore Field - M Nakatsukasa* (JOGMEC), H. Ban (JOGMEC), A. Kato (JOGMEC), N. Shimoda (JOGMEC), D. White (GSC), E. Nickel (PTRC), M. Robertson (LBNL), T.M Daley (LBNL)
15:40	Discussion Time
16:20	End of Day 2
19:30	Workshop Dinner

Oral presentations | Tuesday 20 November

MEETING ROOM	
08:30	Introduction to Day 3 by Chairmen
EM, Gravity, INSAR D. Colombo (Saudi Aramco) & A. Tura (Colorado School of Mines) - PART 2	
08:40	4DS19: Waterflood Monitoring with Surface-to-Borehole CSEM - D. Colombo* (Saudi Aramco), G.W. McNeice (Saudi Aramco)
09:05	4DS20: Reservoir Monitoring Using InSAR data: Latest Advances and Future Trends - A. Rucci (Tra Altamira), S. Cespa* (Tra Altamira), A. Ferretti (Tra Altamira)
09:30	Discussion Time
Data Integration and Reservoir Management B. Res (CGG) & A. Grandi (ADNOC Onshore)	
09:50	4DS21: Comprehensive Reservoir Monitoring and Geomechanical Modelling to Manage Surface Subsidence and Deformation in a Large Field in Oman - J.G.F. Stammeijer* (Petroleum Development Oman), H. Mukhaini (Petroleum Development Oman), S. Mahajan (Petroleum Development Oman), M. Aamri (Petroleum Development Oman), S. Azri (Petroleum Development Oman), R. Rahmoune (Petroleum Development Oman)
10:15	Coffee Break
10:45	4DS22: A Tiered Approach for Maximising the Value of a Noisy 4D Seismic Data in a Carbonate Reservoir - L.J. Wong* (Heriot-Watt University), H. Amini (Heriot-Watt University), C. MacBeth (Heriot-Watt University)
11:10	4DS23: Integrated Reservoir Characterization of the Wattenberg Field, Colorado, USA - J. Daves (Colorado School of Mines), D. Yanrui Ning (Colorado School of Mines), A. Alfataierge (Colorado School of Mines), S. Harryandi (Colorado School of Mines), J. Utley (Colorado School of Mines), J. Simmons (Colorado School of Mines), A. Tura* (Colorado School of Mines)
11:35	KND03 - 4D seismic : Some Examples from Simple to Very Complex Ones, the Need for Integration - T. Coleou* (CGG)
12:05	Discussion Time and Wrap Up
12:45	End of Workshop



REGISTRATION

REGISTERED AND PAID	Until 15/09/2018	15/09/2018 - ON-SITE
Workshop ³		
EAGE Member	€ 835	€ 940
Non-Member ¹	€ 940	€ 1045
EAGE Student Member ²	€ 360	€ 415
Student Non-Member ^{1,2}	€ 415	€ 470

Please note: To qualify for the member registration fee, your EAGE membership dues for 2018 must have been paid and confirmed. The processing time for the membership applications or renewals is 10 working days.

1. The non-member fee includes EAGE membership for 2019.

2. To qualify for the reduced student registration fee:

- Students must be enrolled in a full-time study programme at a recognized university or institute.
- The registration must be accompanied by a copy of a student ID card and/or official proof of enrolment.
- Please note: student non-members cannot be older than 34 of age (when registering).

3. Please note that EAGE reserves the right to cancel the workshop due to low participation.

In this case, payment will be refunded in full.

ALL ABOVE PRICES ARE INCLUSIVE OF 5% VAT

How to register

We recommend that you register via the online registration form on the EAGE website. However, a downloadable registration form, which should be completed and returned to the EAGE Head Office, is also available on the event website page.

VENUE

The workshop will take place at the **Dusit Thani Hotel:**
925 Sultan Bin Zayed The First Street
Abu Dhabi, United Arab Emirates
Phone: +971 (2) 698 8888

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COMPANY DISPLAY AREA

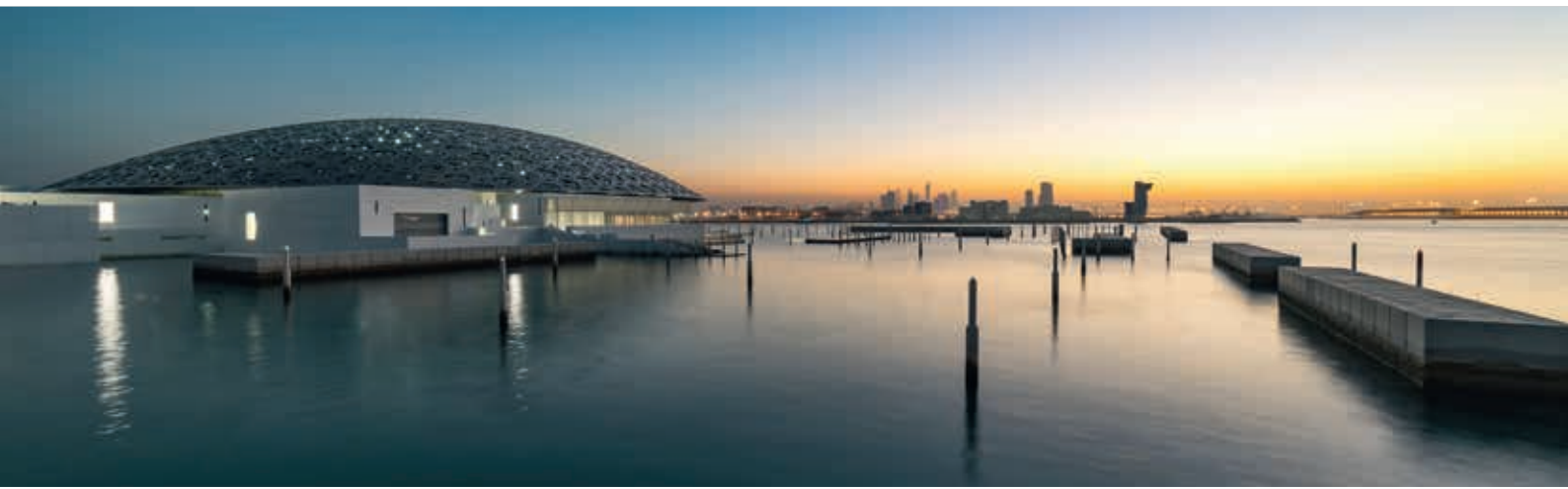
To complement the Technical Presentations the committee would like to invite interested companies to display/demonstrate their products/related technologies in a dedicated "Company Display Area".

Workshop participants will be able to visit the areas during coffee breaks, lunch breaks, and in the afternoons following the Technical Presentations.

If you are interested in this opportunity please email middle_east@eage.org

CONTACT

For more information or to enquire about this workshop, please visit the event website www.eage.org or contact the Middle East Office via middle_east@eage.org or +971 4 369 3897.



See you in Abu Dhabi!

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