

EAGE

EUROPEAN
ASSOCIATION OF
GEOSCIENTISTS &
ENGINEERS



Second EAGE Workshop on Practical Reservoir Monitoring

1-4 APRIL 2019 • AMSTERDAM, THE NETHERLANDS

- **Programme**

WWW.EAGE.ORG



TECHNICAL COMMITTEE

Jeremy Henderson	CNOOC International
Paulo Johann	Petrobras
John Even Lindgård	OCTIO AS
Colin MacBeth	Heriot-Watt University
Mark Thompson	Equinor
Kanglin Wang	Shell

OVERVIEW

Welcome to the Second EAGE Workshop on Practical Reservoir Monitoring. Our first workshop, held during a low-price regime, demonstrated the value of improving production profiles of existing fields and yielding returns in months and years. It also investigated the benefit of investing in a solid baseline of data for capital intensive development projects where the return on investment has lead times measured over longer periods of time. The price regime has improved since the last workshop, but many of the capital constraints remain.

This second workshop edition focuses on the practical applications of Reservoir Monitoring. During this workshop, industry experts will investigate how reservoir monitoring processes can be optimized in order to achieve a full recovery potential of any oil and gas field.

The benefits of incorporating geophysical and engineering data by reservoir engineers, production engineers and others for reservoir monitoring purposes will be investigated through case studies and discussion.

New ideas and future trends for 4D techniques and applications will be explored as well as updates on the progress of Permanent Reservoir Monitoring.

As with the previous workshop a key feature will be an emphasis on discussion and debate and a high level of interaction between the workshop participants.

TECHNICAL PROGRAMME

Sponsored by



Oral Presentations | Tuesday 2 April 2019

08:30	Registrations & Welcome Coffee
CONFERENCE ROOM	
Data Integration J. Henderson, K. Wang	
09:00	Keynote Lecture 1 - Reservoir Management at Brazilian Pre-salt Carbonates - from 4D NODES to PRM in the WAG Injection Context - P. Johann ^{1*} ¹ Petrobras
09:35	Tu PRM 01 - A Tiered Approach for Maximising the Value of Noisy 4D Seismic Data in a Carbonate Reservoir - L.J. Wong ¹ , H. Amini ^{1*} , C. MacBeth ¹ ¹ Edinburgh Time-Lapse Project, Heriot-Watt University

10:00	Tu PRM 02 - Results from a Multi-Faceted Surveillance Program at the Giant Ormen Lange Gas Field - J. Brain ^{1*} , T. Noble ² , M. Glegola ³ ¹ Shell UK Ltd, ² Shell International, ³ NAM
10:25	Tu PRM 04 - Review of Conventional and New 4D Seismic Modelling Techniques - M. Paydayesh ¹ , S. Mitchell ^{1*} , R. Bachrach ¹ ¹ Schlumberger
10:50	Discussion
11:15	Coffee Break / Poster Session
Case Studies J. Henderson, K. Wang	
11:45	Tu PRM 05 - Time-lapse Study in the Western African Offshore: An Integrated Study - B. Webb ^{1*} , C. Rizzetto ¹ , M. Marchesini ¹ , N. Colombi ¹ , V. Milluzzo ¹ ¹ Eni S.p.A. E&P
12:10	Tu PRM 06 - A Case Study of Effective Metrics for History Matching the 4D Seismic Data - H. Amini ^{1*} , M. Rodriguez ¹ , D. Wilkinson ¹ , G.R. Gadirova ¹ , C. MacBeth ¹ ¹ Edinburgh Time-Lapse Project, Heriot-Watt University
12:35	Tu PRM 07 - Troll Reservoir Monitoring, Optimization of Well Placement and Oil Recovery in a Mature Field - H.C.B. Tengedal ^{1*} , S. Solbakken ¹ , Å. Skålnes ¹ ¹ Equinor ASA
13:00	Tu PRM 08 - 4D Seismic for Late Life Field Development - Example from Balder and Ringhorne Fields - A. Bertrand ^{1*} , T. Veggeland ¹ , S. Høgden ¹ , R. Musum ¹ ¹ Vår Energi
13:25	Lunch Break
Geomechanics C. MacBeth, M. Thompson	
14:25	Tu PRM 09 - Practical Monitoring of Seafloor Deformations - P. Hatchell ¹ , S. Dunn ^{2*} , A. Parsons ² , N. Street ² , L. Leddy ² , T. Bennetts ² , C. Hammersley ² ¹ Shell International E&P, ² Sonardyne International Ltd.
14:50	Tu PRM 10 - Geomechanical-induced 4D Seismic Time Shifts - T. Røste ^{1*} ¹ Statoil ASA
15:25	Keynote Lecture 2 - Large-scale Simulations for Ground-truthing of Time-lapse Reservoir Monitoring - J. Herwanger ¹ ¹ MP Geomechanics
15:50	Keynote Lecture 3 - Forecasting Induced Seismicity within the Groningen Gas Field - S. Bourne ¹ ¹ Shell International E&P
16:25	Coffee Break / Poster Session
16:55	Discussion
17:40	End of Day 1



Oral Presentations | Wednesday 3 April 2019

08:00	Welcome Coffee
CONFERENCE ROOM	
Permanent Reservoir Monitoring	
C. MacBeth, M. Thompson	
08:30	Keynote Lecture 4 - 4D/4C Practical Interpretation at the Valhall Field: Dealing with Technology Change, Seismic Imaging Challenge, and Complex Subsurface on a Mature Field - N. Haller ¹ , E. Kjos ^{1*} , P. Paul, R. Paton ¹ ¹ AkerBP
09:05	We PRM 01 - Grane Permanent Reservoir Monitoring: - High Quality 4D Data Gives High Confidence Decisions - R.M. Elde ^{1*} , Z. Zarifi ¹ , S. Sinha Roy ¹ , T. Andersen ¹ , E.H. Uv ¹ ¹ Equinor
09:30	We PRM 02 - Harvesting Value from Permanent Reservoir Monitoring on the Snorre Field - S.M. Skogland ^{1*} , C. Courtial ¹ ¹ Equinor ASA
09:55	We PRM 03 - Grane PRM: Handling Sparse Acquisition Challenges in Processing - M. Berraki ^{1*} , S. Buizard ¹ , R.M. Elde ² , N. Moyle ² , A. Berhorst ² ¹ CGG, ² Equinor ASA
10:20	We PRM 04 - Shallow Subsurface Time-Lapse Using Mirror Imaging - M. McCluskey ^{1*} , S. Buizard ¹ , A. Kritski ² , N. Moyle ² ¹ CGG, ² Equinor
10:45	Coffee Break / Poster Session
4D Processing and Imaging	
J. Even Lindgård, P. Johann	
11:15	We PRM 05 - Optimization of Sparse 4D Seismic Surveys Using Seismic Full Waveform Inversion - S. Carpentier ^{1*} , B. Boullenger ¹ ¹ TNO
11:40	We PRM 06 - Getting the Best out of Up/down Deconvolution for 3D and 4D Imaging - R. Haacke ^{1*} , I. Gregory ¹ , Z. Dobo ¹ , J. Henderson ² , P. McDonnell ² ¹ CGG, ² CNOOC Petroleum Europe Limited
12:05	We PRM 07 - A Robust High-resolution Time-lapse Simultaneous Joint Migration Inversion Process Applied to the Time-lapse Troll Field Datasets - S. Qu ^{1*} , D.J. Verschuur ¹ ¹ Delft University of Technology, Delphi Consortium
12:30	We PRM 08 - 4D Depth-domain Inversion: Recovering Time-lapse Signal from Non-repeatable Surveys - M. Shadrina ^{1*} , C. Leone ¹ , M. Cavalca ¹ , R. Fletcher ¹ , M. Gherasim ² ¹ Schlumberger, ² BP
12:55	We PRM 09 - New 4D Imaging Approaches with Atypical Sparse Seismic Acquisitions for Reservoir Monitoring - D. Lecerf [*] ¹ PGS
13:20	Lunch Break
Data Analytics	
J. Even Lindgård, P. Johann	
14:20	We PRM 10 - Machine Learning to Reduce Cycle Time for Time-lapse Seismic Data Assimilation into Reservoir Management - Y. Xue ^{1*} , M. Araujo ¹ , K. Wang ¹ , J. Lopez ¹ , G. Kumar ¹ , G. Brew ² ¹ Shell International Exploration And Production, ² Dynamic Graphics, Inc
14:45	We PRM 11 - Deep Learning Application for 4D Pressure Saturation Inversion Compared to Bayesian Inversion on North Sea Data - J.S. Dramsch ^{1*} , G. Corte ² , H. Amini ² , M. Lütjhe ¹ , C. MacBeth ² ¹ Technical University of Denmark, ² Heriot-Watt University
15:10	Keynote Lecture 5 - A Quick Journey in 4D: Acquisition, Processing, Feasibility & Reservoir - E. Zabihi Naeini ¹ ¹ Ikon Science Ltd
15:45	Coffee Break / Poster Session
16:15	Discussion
19:00	Workshop Dinner
22:00	End of Day 2



Oral Presentations | Thursday 4 April 2019

08:00	Welcome Coffee
CONFERENCE ROOM	
Alternative Technologies I	
J. Henderson, K. Wang	
08:30	Th PRM 01 - Reservoir Monitoring Using Semi-Permanent Ocean Bottom Nodes - P. Sack ^{1*} , S. Shimizu ² , M. Katagiri ² , Y. Watarai ³ ¹ Sound Oceanics, LLC, ² Nippon Marine Enterprises, Ltd., ³ Seisgadget Ltd.
08:55	Th PRM 02 - Kashagan Oilfield Microseismic Monitoring - S. Filippi ^{1*} ¹ Guralp Systems Ltd
09:20	Th PRM 03 - Combined Surface and Cross-hole Electric Tomography for Reservoir Monitoring - P. Dell'Aversana ^{1*} , R. Servodio ¹ , E. Rizzo ² , F. Bottazzi ¹ , P. Cappuccio ¹ ¹ Eni S.p.A., ² CNR-IMAA
09:45	Th PRM 07 - Seabed Seismic Sources: Are they Feasible? What is the Business Case? - G.F. Watts ^{1*} , E. Bouvard ² ¹ Watts Geoscience Consulting Ltd, ² Alcatel Submarine Networks
10:10	Coffee Break / Poster Session
Alternative Technologies II	
C. MacBeth, M. Thompson	
10:40	Th PRM 05 - Practical Reservoir Monitoring Using Distributed Acoustic Sensor with Engineered Fiber - M. Farhadiroushan ^{1*} , T. Parker ¹ , S. Shatalin ¹ , A. Gillies ¹ , Z. Chen ¹ , A. Clarke ¹ , G. Naldrett ¹ ¹ Silixa Ltd
11:05	Th PRM 06 - Practical Frequent Reservoir Monitoring - K. Wang ^{1*} , P. Hatchell ¹ , A. Mateeva ¹ , D. Kiyashchenko ¹ , Y. Duan ¹ , J. Lopez ¹ ¹ Shell International Exploration & Production Inc.
11:30	Discussion
11:55	End of Workshop

Poster Presentations

The poster presentations will be displayed throughout the workshop and presented during coffee breaks.

CONFERENCE ROOM	
Coffee Break / Poster Session	
PRM P1 - The Effect of Deghosting on the 4D Response: Usan Field, Nigeria - P. Agnisola ¹ , R. O'Driscoll ¹ , P. Smith ^{1*} , D. Chu ² , E.E. Assiak ² , C. Ugwueze ³ , P. Ukerun ³ ¹ ION Geophysical, ² ExxonMobil, ³ Bulwark Services Ltd	

VENUE

American Hotel

Leidsekade 97
1017 PN - Amsterdam
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www.amsterdamamericanhotel.com

REGISTRATION

Your workshop fee includes:

- Coffee Breaks (Throughout the workshop)
- Lunch (Tuesday & Wednesday)
- Icebreaker Reception (Monday evening)
- Workshop Dinner (Wednesday evening)

SOCIAL PROGRAMME

EAGE offers you the opportunity to get to know your fellow workshop participants in a more informal environment. Please inform the EAGE representative on-site if you would like to attend.

Icebreaker Reception

Monday 1 April, 18:00 to 20:00
An Icebreaker Reception is being organized at the workshop venue (American Hotel).

Workshop Dinner

Wednesday 3 April, 19:00 to 22:00
A Workshop Dinner is being organized at the Kitchen & Bar Vondelpark3 restaurant, only a 10 minutes walk from the workshop venue.

Kitchen & Bar Vondelpark3
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The Netherlands
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WORKSHOP APP

In this workshop, you can make use of the EAGE App to easily find the workshop technical programme, speakers info, and have access to all latest updates. You can download the App via your App Store or Play Store (App name: EAGE or european association of geoscientists and engineers). You can also use one of the QR codes below.

You will need a workshop code and a personal 4-digit code to open the App (only at the first login).

Workshop code: prmws2019

PIN code: You can find it on your confirmation e-mail.



IOS devices



Android Devices

CONTACT

For further up-to-date information, please visit the event website via events.eage.org or contact the EAGE staff on-site.

Enjoy your Workshop!

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