

Society of Petroleum Engineers

North Africa Technical Conference and Exhibition 2008

“Exploration and Production Challenges in North Africa”

March 12-14, 2008
Marrakech, Morocco

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60560-147-2

Some format issues inherent in the e-media version may also appear in this print version.

Copyright and Use Restrictions

Copyright 2008, Society of Petroleum Engineers

Material included in this *Proceedings* is copyright protected. Electronic reproduction, distribution, or storage of any part of a SPE-copyrighted paper for commercial purposes without the written consent of the Society of Petroleum Engineers is prohibited. Permission to reproduce in print is restricted to an abstract of not more than 300 words; illustrations may not be copied. The abstract must contain conspicuous acknowledgment of where and by whom the paper was presented. For photocopying beyond the above permissions, libraries and other users dealing with the Copyright Clearance Center (CCC) Transactional Reporting Service must pay a base fee of \$3 per copyrighted article plus \$0.25 per page to CCC, 222 Rosewood Drive, Danvers, Massachusetts 01923 U.S.A. For other permissions, contact Librarian, SPE, 222 Palisades Creek Drive, Richardson, Texas 75080-2040 U.S.A. Use of SPE member or author contact information included on this CD for commercial purposes or reproduction of that information in whole or in part, in any form or medium, is strictly prohibited and subject to legal action. Contact SPE to inquire about rental of mailing lists.

This CD of the 2008 SPE North Africa Technical Conference and Exhibition was produced by SPE. Permission to print and distribute content from this product must be obtained from SPE. Duplication of replication products is absolutely prohibited without written permission from SPE and Adobe. Adobe, the Adobe logo, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. Material on the CD was reproduced from original papers and/or electronic files provided by the authors. Some discrepancies are inevitable. Please advise SPE of errors so corrections can be made to the electronic versions of the article. Send corrections by e-mail to pdf@spe.org or mail to the SPE Americas Office, attention Technical Paper Administrator.

Society of Petroleum Engineers

North Africa Technical Conference and Exhibition
2008

TABLE OF CONTENTS

Remaining Oil Investigation in a High Recovery Oilfield	1
<i>Mike Burke, SPE, and M. Bremeier, SPE, Wintershall Libya; Mohamed Shebani, Libyan National Oil Corp.; ChengGang Xian, SPE, Schlumberger Libya; and J. Dowley, Wintershall Libya</i>	
Topdrive Casing Running and Drilling Tools Reduce Well-Construction Costs and Increase Safety	8
<i>Nazir Shahin and Tracy Cummins, Weatherford Intl.</i>	
Managing Hydrate Risks for a Black Oil Long Subsea Tie-Back When Water Cut Predictions Exceed Original Design	15
<i>A.F. Harun, SPE, BP Egypt; T.J. Blanchard, SPE, BP America; and M. Erdogmus, SPE, BP Azerbaijan</i>	
Evaluating Exploratory Well: Comparison of Rig or Rig Less Testing Strategy	28
<i>Khalifa R. Mohammed, and Alberto Danny Massacese, RepsolYPF; Eric Goldschild, Schlumberger; Javier Fernandez Betria, RepsolYPF; Patrick Perrin, Schlumberger; Ludovic Caillet, RepsolYPF</i>	
An Innovative Tractor Design for Logging Openhole Soft Formation Horizontal Wells	37
<i>Mohamed K. Hashem, SPE, Saleh M. Al-Dossari, SPE, Douglas Seifert, SPE, Saudi Aramco; Mohamed Hassaan, SPE, and Benoit Foubert, SPE, Schlumberger</i>	
A General Approach for Deliverability Calculations of Gas Wells	46
<i>H. Al-Attar, SPE and S. Al-Zuhair, UAE University</i>	
A Simulation Study of Performance Miscible Displacement in El Gassi Field, Algeria	57
<i>C. Merdaci and D. Tiab, University of Oklahoma, Norman, Oklahoma, USA; and T. Zhu, University of Alaska Fairbanks, Fairbanks, Alaska, USA</i>	
Optimum Allocation Methodology for Gas Condensate Wells	71
<i>M. Ibrahim, Faculty of Petroleum & Mining Eng., Suez Canal University, Egypt</i>	
Integrated Reservoir Management Approach Beats the Impact of Reservoir Heterogeneity, Injectivity Challenges, and Delayed Water Flood in Upper Burgan Reservoir in North Kuwait—A Case History	82
<i>HB Chetri, Abd Aziz El- Sabry, Mishal Al-Mufarej, and Ealian Al-Anzi, KOC</i>	
Laboratory Evaluation of Water Swellable Materials for Fracture Shutoff	91
<i>Imran Abbasy, Maersk Oil Qatar AS; Julio Vasquez, Larry Eoff, and Dwyann Dalrymple, Halliburton</i>	
Feasibility Study and Pilot Test of Polymer Flooding in Third Class Reservoir of Daqing Oilfield	104
<i>Hui Pu, SPE, University of Wyoming; Daiyin Yin, Key Laboratory of Enhanced Oil Recovery of Ministry of Education, Daqing Petroleum Institute; Yizhe Chen, PetroChina Daqing Oilfield Co. Ltd; Fulin Yang, SPE, University of Calgary</i>	
Sustaining Fracture Conductivity Increases Cumulative Production in Tight-Gas Reservoir—A Case History	113
<i>Jose Balbino Luna, SPE, Eduardo Soriano D., SPE, Raul Garcia, Halliburton; Juan Galvan R., and Alejandro Barrera C., PEMEX</i>	
Challenging Chemical Gas Shut Off In a Fractured Carbonate Reservoir—Case Studies	125
<i>Hamed Al-Sharji, Ali Ehtesham, Bela Kosztin, and Clement Edwards, PDO; Fardin Ali Neyaei, Tarek Shaheen, Schlumberger</i>	

Integration of Resistivity Imaging and Enhanced Vertical Resolution Nuclear Magnetic Resonance Data for Improved Quantification of Reserves in Thinly Bedded Reservoirs	139
<i>Abdel Hakim Hashem, Melrose Resources Egypt Companies and Ahmed Reda, Halliburton-Egypt</i>	
A Case Study of Oil-Based Mud Effect on Horizontal-Well Productivity	163
<i>Hassan Chaabouni, Schlumberger, Pierre Baux, Dasa Manalu, Muhammad Sobirin, Total E&P Indonesia, Philippe Enkababian, Schlumberger</i>	
Accomplishments and Challenges of Horizontal Well Technology in HassiMessaoud Oilfield	170
<i>B. Achi, SPE, Sonatrach Production</i>	
Modeling and Simulation of Instabilities in Gas-Lifted Oil Wells	179
<i>E. Jahanshahi, K. Salahshoor, R. Kharrat, and H. Rahnema, Petroleum University of Technology</i>	
Multi Lateral Horizontal Well Application for Improving the Oil Recovery of a Mature Field, Intisar N. Field, Concession 103— Libya	190
<i>Mohamed M. Gharsalla and Mohamed B. Elghmari, SPE, Zueitina Oil Company</i>	
The Future Challenge of Horizontal Well Testing in a North African Field: An Overview of a Decade of Field Practice and Operation	201
<i>Salim Bachiri, Sonatash, Ahmed Dahroug, SPE, Schlumberger, and S.Y. Zheng, SPE, Heriott Watt University</i>	
Application of a Highly Efficient Multistage Stimulation Technique for Horizontal Wells	216
<i>Majdi Al Mutawa, SPE, Bader Al Matar, SPE, and Yousef Abdul Rahman, SPE, Kuwait Oil Company; Hai Liu, SPE, Redha Kelkoul, SPE, and Maen Razouqi, SPE, Schlumberger</i>	
Imaging the Deep Mediterranean Through Multi-Azimuth Seismic Acquisition and Processing	224
<i>Walter Rietveld, Jim Keggins, and Mark Benson, BP Egypt, Ted Manning, BP-EPT UK, and Chris Page, PGS UK</i>	
Applied Natural Fracture Characterization Using Combination of Imagery and Transient Information: Case Studies From Cambro-Ordovician Tight Sandstones of Algeria	228
<i>Nouredine Bounoua, Sonatrach DP, and George Dozier, Philippe Montaggioni, and Arnaud Etchecopar, Schlumberger North Africa</i>	
Successful Primary Cementing of High-Pressure Saltwater Kick Zones	246
<i>Ricardo Marinéz and Mohamed El Shabrawy, Belayim Petroleum Company (PETROBEL), Osama Sanad and Arshad Waheed, Halliburton</i>	
New, Highly Effective Asphaltene Removal System With Favorable HSE Characteristics	258
<i>K.A. Frost, R.D. Daussin, SPE, and M.S. van Domelen, SPE, Halliburton</i>	
Meeting the Flow Assurance Challenges of Deepwater Developments: From Capex Development to Field Start Up	274
<i>M.M. Jordan and N.D. Feasey, Nalco Ltd.</i>	
Gas-Tight Rotary Shoulder Connection for High-Pressure Completion, Intervention Riser and Drilling Applications	301
<i>Michael J. Jellison, Andrei Muradov, Jim Brock, Grant Prideco, and Barry Vinson</i>	
A Step Change in Field Management of the Matured Water Flood: Oman	309
<i>Dr. Ali Al-Gheithy, SPE, and Ali Al-Suleimani, SPE, Petroleum Development Oman LLC</i>	
Practical Methods to Sustain Production After Hydraulic Fracturing Treatment in Marginal Wells—Case History from Western Desert Egypt	315
<i>R. Yassine, M. Amr, and M. Salem, Halliburton; H. Ibrahim, M.M. Shehata, W. Abdel Aziz, K.F. Nagia, Agiba Oil Co.</i>	
Innovative Solution for Selective Testing of a Horizontal Well Saves Seven Days of Rig Time	321
<i>Klaus Scherwitzel, Petroleum Development Oman and Alun Whittaker, Weatherford International</i>	

Seismically Driven Characterization, Simulation, and Underbalanced Drilling of Multiple Horizontal Boreholes in a Tight Fractured Quartzite Reservoir: Application to Sabria Field, Tunisia	327
<i>A. Ouenes, G. Robinson, D. Balogh, A. Zellou, Prism Seismic, D. Umbsaar, H. Jarraya, Winstar, T. Boufares, L. Ayadi, R. Kacem, ETAP</i>	
CO2 Geological Storage Field Development: Initial Experiences in an Emerging Industry ...	339
<i>N.J. Jenvey, SPE, R.S. Moen, N. Muller, Shell International Exploration and Production; J. Buehler, Shell Global Solutions U.S. Inc.; M.S. Costello, Shell Exploration and Production Co.; M.M. Schwander, Shell Development (Australia) Pty Ltd.</i>	
First Application of New Expandable Liner Hanger Technology in Deepwater HP/HT Well of Egypt	347
<i>Melvin Moore, and Jesse Lopez, BP-Egypt; Edgar Chacon, Ron Nida, and Arshad Waheed</i>	
Optimizing Hydraulic Fracturing in a Mature Oil Reservoir in Algeria	361
<i>J.R. Shaoul, SPE, W. Spitzer, SPE, Pinnacle Technologies, S. Mendenhall, SPE, S. Soufi, S. Aloun</i>	
A Thermal Recovery Method for Medium-Heavy Oil Reservoirs	374
<i>A.H. de Zwart, P. Bakker and C.A. Glandt, Shell International Exploration and Production, A.D. Brooks, and J. van Dorp, Shell Technology Oman</i>	
Basin Evolution from Integrated Seismic, Gravity, and Magnetic Data Interpretation in North Africa	384
<i>Susanne Witte, Shell International Exploration and Production</i>	
Practical Aspects of Streamline Application to Water Injection Management of a Giant Carbonate Reservoir	388
<i>Alfonso Rodriguez, Naseem J. Dawood, Yinka Soremi, and A. Taiban, Saudi Aramco</i>	
Case Study: The Application of a Sand Management Solution for the Sarir Field in Libya	393
<i>K. Qiu, SPE, Schlumberger; Y. Gherryo and M. Shatwan, SPE, AGOCO, Libya; R. Marsden, J. Alexander, A. Retnanto</i>	
One Company's First Exploration UBD Well for Characterizing Low Permeability Reservoirs	405
<i>C.K. Woodrow, Shell E&P International Ltd.; D. Elliott, Shell E&P; R. Pickles, Blade Energy Partners; and D.B. Cox, Weatherford</i>	
The Role of Multi-Disciplinary Teams in Innovative Reservoir Management Projects	414
<i>Ganesh Thakur, SPE, Chevron Energy Technology Co.</i>	
Rigless Exploration Well Testing Experience in Algeria	427
<i>Cherif Hellal, Sonatrach; Yasmine Nassim, Schlumberger; and Ali M. Bakici, SPE, Schlumberger</i>	
Unconventional Reservoir Modeling of a Gas Field in the Nile Delta of Egypt	438
<i>Ahmed Daoud, SPE, Osama Hegazy, Yasser Hazem, Mohamed Lotfy, Samir Yousef, and Sami Bustami, Aramco, SPE, Schlumberger, and Anas El-Hawary</i>	
Simplified Country Entry Risk Assessment Model for Global Petroleum Investments	452
<i>Surya Rajan, SPE, Marathon Oil Company; and Shree Vikas</i>	
Enhancement of Gas Management for Flaring Reduction in KOC (West Kuwait)	462
<i>Ali Al-Kanadari and Siddhartha Ray, Kuwait Oil Company</i>	
The Omar Field (N.E. Syria) is Overcoming Its Mid-Life Crisis	468
<i>J. Neidhardt, H. Farran, I. Gonzalez, and P. Vledder, Shell Syria; and Y. Doughry</i>	
Geomechanical Aspects of 15 Years Water Injection on a Field Complex: An Analysis of the Past to Plan the Future	475
<i>F.J. Santarelli, Geomec and O. Havmøller and M. Naumann</i>	
Integrated Fluid Characterization: Maximising the Value of Fluid Information From Exploration to Production	488
<i>Daniel McKinney, Ed Clarke, Hani Elshahawi, Matthew Flannery, Mohamed Hashem, Artur Stankiewicz</i>	

High Density Brine-Based Drill-In Fluid Improved Reservoir Producibility in Gas Field Offshore Egypt	497
<i>A.M. Ezzat, SPE, Medhat Gamal, SPE, Halliburton, and Stefano D'Angelo</i>	
From Lean to Extreme-Lean Well Profile: Field Experience in the Mediterranean Sea	508
<i>F. Donati, P. Ferrara, Eni S.P.A.M., Maestrami, Belayim Petroleum Co., J. Oppelt, and S. Krüger</i>	
Well-Test Planning for Deepwater Wells in High-Pressure, High-Temperature Environments—The Brazil Experience	519
<i>Alejandro Salguero, Edgar Almanza, and Harold Nivens</i>	
Deepwater Gulf of Mexico Development Challenges Overview	531
<i>Frank Close, Bob McCavitt, and Brian Smith</i>	
Constant Bottomhole Pressure: Managed-Pressure Drilling Technique Applied in an Exploratory Well in Saudi Arabia	546
<i>P. Vieira, M. Arnone, B. Russel, I. Cook, K. Moyse, F. Torres, and Hani Qutob, Weatherford International, and Chen Yuesheng and Chen Qing</i>	
Combined Underbalanced/Coiled-Tubing Drilling Technologies Have Improved Oil Recovery and Activated Abandoned Wells in Hassi Messaoud Field, Algeria	560
<i>Bachir Ben Amor, Ali Ferhat, and Rafik Messas, Sonatrach, and Maurizio Arnone, Fritz Schoch, Paco Vieira, James Chopty, and Hani Qutob</i>	
First Multilateral Well Drilled With Underbalanced Drilling Technology in Sabria Field—Tunisia	574
<i>Roger McMechan, Julien Beaudry, and Raymond Beaudry, Winstar Resources Limited, Maurizio Arnone, Wesam Al Heureithi, Paco Vieira, and James Chopty</i>	

Author Index