

# **SPE/IADC Drilling Conference and Exhibition 2013**

**Amsterdam, The Netherlands  
5-7 March 2013**

**Volume 1 of 2**

**ISBN: 978-1-62748-026-0**



## TABLE OF CONTENTS

SPE 161155	<b>Solving Stick-Slip Dilemma: Dynamic Modeling System Significantly Reduces Vibration, Increases ROP by 54%</b>	1
	<i>Norain Abd Rahman, Azlan Mohaideen, Farah Hanim Bakar, Petronas Carigali Sdn Bhd, Kien Hoe Tang, Radha Maury, Paul Cox, Phi Le, Hugh Donald, Edwin Brahmanto, Bramanta Subroto, Schlumberger</i>	
SPE 163816	<b>Evolution of Drilling and Completions in the Slave Point to Optimize Economics</b>	17
	<i>Nolan Lerner, SPE, Brent Schaab, SPE, Juan Garcia, SPE, Dan Bianco, SPE, Scott Thomas, SPE, Jason Thompson, PennWest Exploration; Jeremy Hollan, SPE, Packers Plus Energy Services</i>	
SPE/IADC 163402	<b>Delivering Consistent Top Quartile Drilling Performance Without Compromise</b>	45
	<i>Mark Cockram, BG Group, Arne Wyller Christensen, RMN, Bruce Thistle, Suncor, Willem Boon von Ochssee, Noreco, Jean Claude Sinet, Nexen, Frode Hevroy, Svein Bjarne Barke, Seadrill</i>	
SPE/IADC 163403	<b>Living the HSE Vision and Values - Delivering Success in an Environment of Significant Change; Inside and Outside the Organization</b>	55
	<i>George Siokos, George Siokos Consulting (EDN); John Karish, EnSCO plc</i>	
SPE/IADC 163405	<b>Novel Technique to Drill Horizontal Laterals Revitalizes Aging Field</b>	62
	<i>Steven D. Cinelli, University of Alaska Fairbanks, and Ahmed H. Kamel, University of Texas of the Permian Basin</i>	
SPE/IADC 163406	<b>Application of Targeted Bit Speed (TBS) Technology to Optimize Bakken Shale Drilling</b>	73
	<i>Wendell D Bassarath, SPE, Christopher A Maranuk, SPE, Weatherford</i>	
SPE/IADC 163407	<b>Drill Pipe Riser Intervention System Successful Experience in Offshore West Africa</b>	81
	<i>Christophe Rohart, Henri de Fonvielle, Laurent Bordet, VAM Drilling, William Campbell, Nenad Susak, Total, Mitra Marajh, FMC Kongsberg International A.G.</i>	
SPE/IADC 163408	<b>Maximizing BHA Durability/Reliability: Turbodrill/Impregnated Bit Significantly Reduces Drilling Time in Granite Wash Laterals</b>	89
	<i>Glenn Bone, Christopher Jamerson, Apache Corp; Jay Klassen, Jordan Gray, Somasundaram Valliyappan, Ryan Baker, Kerry Turner, Miguel Parra, Schlumberger</i>	
SPE/IADC 163409	<b>Unique Motor Design Decreases Costs While Improving Performance in High Speed Drilling Applications</b>	107
	<i>B. Guidroz, National Oilwell Varco; M. Hussain, National Oilwell Varco; D. Erlandson, Talisman Energy; C. Zowtuk, Talisman Energy</i>	



5–7 MARCH 2013

RAI CONGRESS CENTRE  
AMSTERDAM, THE NETHERLANDS

WWW.SPE.ORG/EVENTS/DC

THE PREMIER DRILLING EVENT

## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163410 Large Bore Expandable Liner Hangers for Offshore and Deepwater Applications Reduces Cost and Increases Reliability: GOM Case History 116  
*John McCormick, Alexis Carter, and Rick Johnson, Halliburton*
- SPE/IADC 163411 Well Bore Collision Avoidance and Interceptions - State of the Art 124  
*John P de Wardt, De Wardt and Company; Steve Mullin, Gyrodata Inc; John L Thorogood, Drilling Global Consultant LLP; John Wright, Bearco International; Robert Bacon, BP*
- SPE/IADC 163412 Industry Analogies for Successful Implementation of Drilling Systems Automation and Real Time Operating Centers 136  
*John P de Wardt, De Wardt and Company Inc.*
- SPE/IADC 163413 Planning for Successful Jarring Operations - Effective Use of Drilling Impact System Helps Release Stuck Pipe 146  
*Jose L Mercado, Schlumberger*
- SPE/IADC 163415 Exploration and Appraisal Drilling Operations in the South Atlantic 155  
*J.W. Jenner, SPE, and A. Morrison, Rockhopper Exploration plc; R. Lyons, Desire Petroleum plc; L. Phillips, AGR Petroleum Services; I. McBean, Diamond Offshore Drilling (UK) Ltd*
- SPE/IADC 163416 The Evolution of Wired Drilling Tools: A Background, History and Learnings from the Development of a Suite of Drilling Tools for Wired Drillstrings 172  
*Craig, A. D., Jackson, T. A., Ramnarace, D., Schultz, R., Briscoe, M., National Oilwell Varco*
- SPE/IADC 163417 Detect Kicks Prompted by Losses and Direct Measurement Well Control Method through Networked Drillstring with Along String Pressure Evaluation 181  
*Daan Veeningen, NOV IntelliServ*
- SPE/IADC 163418 Use of Liner Drilling Technology as a Mitigation to Lost Circulation in The Faja De Oro (Golden Lane) Oil Fields Offshore Veracruz, Mexico 191  
*L. F. Aguilera Naveja, Pemex Exploration and Production; Steven M. Rosenberg, SPE, and Marco A. Dominguez M., SPE, Weatherford International Ltd*
- SPE/IADC 163420 Drillstring Mechanics Model for Surveillance, Root Cause Analysis, and Mitigation of Torsional and Axial Vibrations 203  
*Deniz Ertas, ExxonMobil Research and Engineering Company; Jeffrey R. Bailey, SPE, ExxonMobil Development Company; Lei Wang, SPE, ExxonMobil Technical Computing Company; Paul E. Pastusek, SPE, ExxonMobil Development Company*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163422 **Drilling Systems Automation - Preparing for the Big Jump Forward** 217  
*John P de Wardt, De Wardt and Company; Michael Behounek, Apache; Clinton Chapman, Devi Putra, Schlumberger*
- SPE/IADC 163424 **Comparing Soft-String and Stiff-String Methods Used to Compute Casing Centralization** 233  
*Lidia Gorokhova, Andrew Parry, Nicolas Flamant, Schlumberger*
- SPE/IADC 163425 **Optimal Bit, Reamer Selection and Operating Procedures Improve Hole Enlargement Performance in Deepwater Gulf of Mexico** 244  
*T. Ho, C. Alferez, M. Cortez, Baker Hughes; I. Nott, X. McNary, Chevron*
- SPE/IADC 163426 **Innovative Managed-Pressure-Cementing Operations in Deepwater and Deep Well Conditions** 260  
*Youssef Elmarsafawi and Amor Beggah, Schlumberger*
- SPE/IADC 163428 **Torsional Resonance - An Understanding Based on Field and Laboratory Tests with Latest Generation Point-the-Bit Rotary Steerable System** 266  
*L. A. Lines, SPE, D. R. H. Stroud, SPE, and V. A. Coveney, Weatherford*
- SPE/IADC 163429 **Basis of Design and Specifications for Shallow Water Arctic MODU for Year-round Operation, Development and Exploration** 279  
*R.S. Shafer, P.N. Noble, ConocoPhillips Company, T.O. Cheung, Y.Y. Chow, Keppel Offshore and Marine, M. Quah, K.S. Foo, C. D. Wang, M.J. Perry, Keppel Offshore and Marine Technology Centre*
- SPE/IADC 163430 **Automated Decision Support to Enhance While-Drilling Decision Making: Where Does it fit Within Drilling Automation?** 288  
*Andreas Sadlier, Baker Hughes, Ian Says, Baker Hughes, and Ryan Hanson, Verdande Technology*
- SPE/IADC 163431 **Remote Operations Center - An Efficient and Highly Competent Environment to Optimize Operational Performance and Reduce Risk** 296  
*Arve K. Thorsen, SPE, Erlend Sæverhagen, SPE, Jan Ove Dagestad, SPE, Baker Hughes*
- SPE/IADC 163434 **Wellbore Strengthening- Nano-Particle Drilling Fluid Experimental Design Using Hydraulic Fracture Apparatus** 306  
*Charles O. Nwaoji, SPE, Geir Hareland, SPE, Maen Husein, SPE, University of Calgary, Runar Nygaard, SPE, Missouri University of Science and Technology, and Mohammad Ferdous Zakaria, SPE, University of Calgary*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163436 **A Breakthrough Performance for an Inland Application with a Hybrid Bit Technology** 318  
*M. Di Pasquale, E. Calvaresi, Baker Hughes; S. Pecantet, NV Turske Perenco*
- SPE/IADC 163437 **Multiwell Thermal Interaction: Field Data Validation of Transient Model for Closely Spaced Wells** 335  
*Albert R. McSpadden, SPE, Altus Well Experts, Inc.; Alex Gunn, SPE, and Craig Dunagan, ConocoPhillips Inc.*
- SPE/IADC 163438 **Analysis of Potential Bridging Scenarios During Blowout Events** 345  
*S.M. Willson, Apache Corporation, A.S. Nagoo and M.M. Sharma, University of Texas at Austin*
- SPE/IADC 163439 **Design Aid for Charting a Drilling Automation Roadmap** 364  
*Mario Zamora, M-I SWACO, a Schlumberger company, and Ginger Hildebrand, Schlumberger*
- SPE/IADC 163440 **Toward Drilling Automation: On the Necessity of Using Sensors That Relate to Physical Models** 372  
*E. Cayeux, SPE, B. Daireaux, E.W. Dvergsnes, SPE, IRIS; F. Florence, SPE, National Oilwell Varco*
- SPE/IADC 163441 **Brittle Failures of Oil Field Components Due to Improper Testing Methods** 397  
*Srinivasa Koneti, John Ross and Samit Gokhale, SPE, T H Hill Associates, Inc.*
- SPE/IADC 163442 **Full-scale Testing Shows Advantages of a Quantitative Approach to Interpreting Negative Pressure Tests** 409  
*Reza Rahmani, SPE; Darryl Bourgoyne, Louisiana State University; and John Rogers Smith, SPE, Louisiana State University*
- SPE/IADC 163443 **First Oil Requirements Drive Simultaneous Drilling and Subsea Construction Operations on UK Central North Sea Development** 423  
*R. M. Allan, SPE, Z. Arain, SPE, B. Fraser, S. Short, and S. Davidson, E.ON E&P UK Ltd*
- SPE/IADC 163445 **Feasibility Study of Applying Intelligent Drill Pipe in Early Detection of Gas Influx during Conventional Drilling** 437  
*Karimi Vajargah, A., Miska, S. Z., Yu, M., Ozbayoglu, M.E., The University of Tulsa and Majidi, R., BP America*
- SPE/IADC 163446 **Accounting for Lost Circulation and NAF Compressibility - Impacts on Cement Placement** 452  
*J.M. Shine, Jr., S.A. Chaudhary, A.J. Felio, R.S. Martin, Baker Hughes, Inc.*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163447 **Shale Play Drilling Challenges: Case Histories and Lessons Learned** 463  
*Michael Jellison, Jim Brock, Andrei Muradov, Dan Morgan, NOV Grant Prideco, Jim Rowell, Premium Oilfield Services*
- SPE/IADC 163448 **Cost Effective Ultra-Large Diameter PDC Bit Drilling in Deepwater Gulf of Mexico** 477  
*Piero D'Ambrosio, SPE, NOV IMO, Ernest Prochaska, SPE, Reisha Bouska, SPE, NOV Downhole, Douglas Tinsley, DMTJ Energy Consulting, Sofiri Hart, SPE, BP America*
- SPE/IADC 163449 **RFID. A Key Enabler In Drilling Automation** 500  
*Mads Grinrod, Minerals Group AS, Manfred Vonlanthen, Trac ID Systems AS, Arne Thomas Haaland, Trac ID Systems AS, Rune Gaasoy Statoil ASA*
- SPE/IADC 163451 **A Collaborative Approach for Planning a Drilling With Liner Operation** 510  
*Steven M. Rosenberg, SPE, Tracy J. Cummins, SPE, Timothy P. Dunn, SPE, Ming Zo Tan, SPE, and Rex L. Winchell, SPE, Weatherford*
- SPE/IADC 163452 **HPHT Well Construction with Closed-Loop Cementing Technology** 527  
*Don Hannegan, Tim Dunn, Weatherford International Ltd., Dennis Moore, Marathon Oil Corporation, Dr. Ken Gray, University of Texas at Austin*
- SPE/IADC 163453 **On the Path for Offshore Drilling Automation** 543  
*A. L. Martins, R. A. Gandelman, M. G. Folsta, E. L. Resende, Petrobras, Marcia Vega, UFRRJ, Romulo Aguiar, Dimitrios Pirovolou, Schlumberger, R. March e D. Gullo, ESSS*
- SPE/IADC 163454 **Calibrating Automated Event Detection Algorithms for Real-Time Wellbore Stability Applications** 556  
*Stefan Wessling, Anne Bartetzko, Philipp Tesch, Thomas Dahl, Baker Hughes Inc.*
- SPE/IADC 163455 **Casing Design for Dual Gradient Wells** 567  
*Andre J. Cantrell, SPE, Cherokee Offshore Engineering, and Mingqin Duan, SPE, Chevron*
- SPE/IADC 163456 **White Rose Project Drilling and Completion Performance Evolution: A Case Study** 585  
*Craig Pardy, Husky Energy Inc; Goke Akinniranye, SPE, K & M Technology Group; Mackenzie Carter, Schlumberger; Gerry Crane, Lisa Wishart, Husky Energy Inc; Tony Krepp, SPE, Brandon Foster, SPE, K & M Technology Group*
- SPE/IADC 163457 **Case Study of Rotating Expandable Reamer Across Whipstock and Drilling Ahead over 8,000 ft Reduces Drilling Time** 616  
*S Radford, S Desselle, D Enterline, M Allain, J Oliveire, Baker Hughes; B Pearl, J Palmer, Chevron North American Exploration and Production Co.*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163458 **Novel Drill Bit Materials Technology Fusion Delivers Performance Step Change in Hard and Difficult Formations** 624  
*Alexis García, Hector Barocio, Denise Nicholl, Sid-Ali Belhenniche, NOV; Rafael Quijada, Eni; Cynthia Veloz, Moisés Cevallos, Petroamazonas*
- SPE/IADC 163459 **Dynamic Cementation: A Solution to Well Integrity Problems** 634  
*Calvin Holt, Nilesh Lahoti, and Vince Fortier, SPE, Tesco Corporation*
- SPE/IADC 163460 **Novell Drilling Fluid Design Enables Successful Drilling of Depleted Carbonate Reservoirs Offshore Republic of Congo** 642  
*Seye Thomas, SPE, M-I SWACO, A Schlumberger Company; Jerome Leleux, Alex Delvaux, Perenco*
- SPE/IADC 163461 **LWD Sonic Cement Logging: Benefits, Applicability, and Novel Uses for Assessing Well Integrity** 652  
*Matthew Blyth, SPE; and Douglas Hupp, SPE, Schlumberger; Iain Whyte, SPE, Tullow Oil Plc; Toshihiro Kinoshita, Schlumberger*
- SPE/IADC 163462 **Zonal Isolation through Gas Hydrates Offshore Tanzania** 666  
*J. Vølstad, T. Tveit, Statoil; P. Aguilar, N. Hurtado, M. Bogaerts, Schlumberger*
- SPE/IADC 163463 **Extended Reach Drilling - New Solution with a Unique Potential** 678  
*O. Vestavik, Reelwell, M. Egorenkov, Merlin ERD, B. Schmalhorst, RWE Dea AG, J. Falcao, Petrobras*
- SPE/IADC 163464 **Pre-Job Modeling/Resulting Integrated BHA System Solution Sets Multiple ROP Records, North Field Qatar** 689  
*Michael L. Kieschnick, Tony Jacob, Biju James, Venkatesh Karuppiyah, Rob Hamilton, Smith Bits, a Schlumberger Company*
- SPE/IADC 163465 **A Medium-Order Flow Model for Dynamic Pressure Surges in Tripping Operations** 704  
*Kristian Gjerstad, Teknova AS; Rune W. Time, Department of Petroleum Engineering, University of Stavanger; Bjarkevoll, Sintef Petroleum Research*
- SPE/IADC 163466 **Autonomous Robotic Drilling Systems** 720  
*Kenneth Søndervik, Robotic Drilling Systems AS*
- SPE/IADC 163467 **New Directional Drilling Simulation Tool Reveals Link between Dynamic Stability and Tool Face Control** 725  
*Reed Spencer, Baker Hughes, Jonathan Hanson, Consultant, Olivier Hoffmann, Ajay Kulkarni, Cliff Allison, Baker Hughes*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163472 Design, Development, and Field Testing of a High Dogleg Slim-Hole Rotary Steerable System 742  
*Richard Hawkins, SPE, Steve Jones, SPE, James O'Connor, SPE, and Junichi Sugiura, SPE, Schlumberger*
- SPE/IADC 163473 Automatic Mud Mixing 748  
*R. R. Nafikov and M. S. Glomstad, Statoil ASA*
- SPE/IADC 163474 Automated Alarms for Smart Flowback Fingerprinting and Early Kick Detection 764  
*Tarab H. Ali, Sven M. Haberer, Ian P. Says, Charles C. Ubaru, Moray L. Laing, Baker Hughes, Olav Helgesen, Max Liang, Bente Bjelland, Statoil North America*
- SPE/IADC 163475 Instrumented Internal Blowout Preventer Improves Measurements for Drilling and Equipment Optimization 773  
*Robert Wylie, SPE, Jim Standefer, SPE, Jason Anderson, SPE, and Ian Soukup, SPE, National Oilwell Varco*
- SPE/IADC 163476 Modeling Reveals Hidden Conditions That Can Impair Wellbore Stability and Integrity 787  
*Robert F. Mitchell, SPE Halliburton, Ronald Sweatman, Consultant, and Gary Young, Encana Oil & Gas (USA) Inc.*
- SPE/IADC 163477 Drillstring Analysis with a Discrete Torque-Drag Model 797  
*Robert F. Mitchell, SPE, Halliburton, Arve Bjørset and Gaute Grindhaug, Statoil*
- SPE/IADC 163478 Analysis of Torsional Shock During Drilling 817  
*Tony Collins, Schlumberger*
- SPE/IADC 163479 Implementation of PMCD to Explore Carbonate Reservoirs from Semi-Submersible Rigs in Malaysia results in Safe and Economical Drilling Operations 824  
*M Noreffendy Jayah, SPE, Intan Azian A Aziz, SPE, PETRONAS; Travis Mathews, SPE, Allan Voshall, SPE, Freddy Rojas Rodriguez, SPE, Schlumberger*
- SPE/IADC 163480 Analytical Model to Estimate the Drag Forces for Microhole Coiled Tubing Drilling 839  
*Yuan Zhang and Ye Hao, University of Houston; Robello Samuel, Halliburton*
- SPE/IADC 163481 Practical Guide to Lost Returns Treatment Selection Based on a Holistic Model of the State of the Near Wellbore Stresses 850  
*Ranojoy D. Duffadar, SPE, ExxonMobil Upstream Research Company, Fred E. Dupriest, SPE, ExxonMobil Development Company (retired), Sabine C. Zeilinger, SPE, ExxonMobil Development Company*



5–7 MARCH 2013

RAI CONGRESS CENTRE  
AMSTERDAM, THE NETHERLANDS

WWW.SPE.ORG/EVENTS/DC

THE PREMIER DRILLING EVENT

## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163482 **Sakhalin Gas Shut-off Workovers: A Case History of Zonal Isolation at Record Depths** 863  
*Richard Molloy, ExxonMobil Development Company*
- SPE/IADC 163483 **Macondo Litigation and its Impact on the Offshore Industry -- What Every Operator, Driller, Service and Supply Company Needs to Know** 875  
*C. Moomjian, Jr., CAM OilServ Advisors LLC*
- SPE/IADC 163484 **The Stability of a Pipe Stand Racked in a Derrick, Part 1 - Foundation** 884  
*S.J. Sawaryn, SPE, BP Exploration Operating Company Ltd.*
- SPE/IADC 163485 **Offshore West Africa Deepwater ERD: Drilling Optimization Case History** 904  
*Hernando Jerez, SPE, Rafael Dias, SPE, and Jim Tilley, SPE, Halliburton*
- SPE/IADC 163486 **Analytical Model to Characterize 'Smear Effect' Observed while Drilling with Casing** 914  
*Aniket Kumar, University of Houston, Robello Samuel, Halliburton*
- SPE/IADC 163487 **Case History of a Challenging Thin Oil Column Extended Reach Drilling (ERD) Development at Sakhalin** 929  
*Vishwas P. Gupta, Shea R. Sanford, SPE, ExxonMobil Development Company, Randall S. Mathis, Erin K. DiPippo, SPE, Exxon Neftegas Ltd., Michael J. Egan, AIPC, Consultant to Exxon Neftegas Ltd.*
- SPE/IADC 163489 **Operational Control and Managing Change: the Integration of Non-technical Skills with Workplace Procedures** 951  
*JL Thorogood, Drilling Global Consultant LLP and MT Crichton, People Factor Consultants Ltd*
- SPE/IADC 163491 **Innovative Hybrid Bit Mitigates Geological Uncertainties, Improves Drilling Performance in Brazilian Pre-Salt Formations** 967  
*Slim Hbaieb, Michael Azar, Smith Bits, a Schlumberger Company*
- SPE/IADC 163492 **Real-Time Evaluation of Hole Cleaning Conditions Using a Transient Cuttings Transport Model** 978  
*E. Cayeux, SPE, IRIS; T. Mesagan, SPE, S. Tanripada, SPE, M. Zidan, SPE, Statoil; K.K. Fjelde, University of Stavanger*
- SPE/IADC 163493 **Dual Fuel Progress in Reliability and Performance for the Oil and Gas Market** 997  
*Eric HENIN, CEng ImechE, CEng IET, Caterpillar*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163494 Successful Application of Concentric Casing Nitrogen Injection to Overcome Drilling Challenges and Deliver a Record Horizontal Well in the Tecominoacan Field 1003  
*Reginaldo Rodríguez, Roberto Franco, and Gustavo Gamez, Pemex, Bernardo Blas, Fernando Daniel Gonzalez, Jose Luis Vasquez, and Hugo Alcudia/Halliburton*
- SPE/IADC 163495 The Application of UBD and MPD Techniques to Solve Challenges and Optimize Drilling in the Quintuco and Vaca Muerta Formations in the Neuquén Basin 1015  
*Ricardo Leon, Juan Benedetti, Isabel C. Poletzky, SPE, Halliburton Energy Services, Nemesio E. Gomez Vicent, YPF*
- SPE/IADC 163496 Rank Wildcat Drilling Risks & Drilling Time Reduced in Ultra Deepwater Offshore Namibia with the Application of Seismic & Formation Pressure While Drilling Technology 1028  
*Anthony Jervis, Julia Kemper, Martin Richards, Matthew Taylor, Chariot Oil & Gas, Colin Clarke, Senergy World, Marcus Turner, Neil Kelsall and Jean Claude Puech, Schlumberger*
- SPE/IADC 163498 The Application of Advanced Gas Extraction and Analysis System Complements Early Kick Detection & Control Capabilities of Managed Pressure Drilling System with Added HSE Value 1038  
*Bhavin Patel, Todd Cooper; Weatherford International; Will Billings; Talisman Energy*
- SPE/IADC 163499 Subsea Cap & Contain Method for a Deepwater Tension Leg Platform 1044  
*John A. Henley, Shell Exploration and Production Company, Tammy Webb, Shell Exploration and Production Company, Chris Wibner, Shell International Exploration and Production, James Soliah, Delmar Systems Inc.*
- SPE/IADC 163501 Utilizing Wired Drill Pipe Technology During Managed Pressure Drilling Operations to Maintain Direction Control, Constant Bottom-hole Pressures and Well-bore Integrity in a Deep, Ultra-depleted Reservoir 1062  
*John Rasmus, SPE, Alain Dorel, Tony Azizi, Andre David, Ember Duran, Hector Lopez, Gare Aguiñaga, Juan Carlos Beltran, Antonio Ospino, Schlumberger, Eduardo Ochoa, NOV IntelliServ*
- SPE/IADC 163502 High Performance Water-Based Drilling Fluids - An Environmentally Friendly Fluid System Achieving Superior Shale Stabilization While Meeting Discharge Requirement Offshore Cameroon 1081  
*Anuradee Withayapanyanon, SPE, Baker Hughes; Jerome Leleux, SPE, Perenco; Julien Vuillemet, Perenco; Ronan Morvan, Perenco, Andre Pomian, Perenco; Alain Denax, Baker Hughes, and Ronald Bland, SPE, Baker Hughes*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163503 **Design Evolution of Drilling Tools to Mitigate Vibrations** 1088  
*J. R. Bailey, SPE, ExxonMobil Development Company; C. C. Elsborg, SPE, ExxonMobil E&P Norway AS; R. W. James, SPE, P. E. Pastusek, SPE, M. T. Prim, SPE, W. W. Watson, SPE, ExxonMobil Development Company*
- SPE/IADC 163504 **Simulation of Single Cutter Experiments in Evaporites through Finite Element Method** 1111  
*Ingrid Reyes Martinez, Sergio Fontoura, Nelson Inoue, Carla Carrapatoso, Pontifical Catholic University of Rio de Janeiro; Affonso Lourenço, David Curry, Baker Hughes*
- SPE/IADC 163505 **Drilling Optimization in Deep Tight Gas Field** 1125  
*Mohamed Al Sharafi, SPE, Schlumberger; Muneer Al Naamani and Ibrahim Al Shidhani, SPE, Petroleum Development of Oman; Yousuf A. Thani, Schlumberger; Nour Hariri, SPE, Schlumberger*
- SPE/IADC 163507 **A New Standard in Wireline Coring: Recovering Larger Diameter Wireline Core through Standard Drill Pipe and Custom Large Bore Jar** 1133  
*Travis Farese, National Oilwell Varco; Hammad Ahmed, National Oilwell Varco; Assaad Mohanna, National Oilwell Varco*
- SPE/IADC 163508 **Drilling Fluid Selection Methodology for Environmentally Sensitive Areas** 1138  
*Paul Burden and Klisthenis Dimitriadis Tullow, Kayli Clements, Chau Nguyen, Tony Staples, Seye Thomas, M-I SWACO, A Schlumberger Company*
- SPE/IADC 163509 **Experience from Hardware-In-the-Loop Testing of Drilling Control Systems** 1164  
*Tom Pedersen and Øyvind Smogeli, Marine Cybernetics*
- SPE/IADC 163510 **Advanced Dynamic Training Simulator for Drilling As Well As Related Experience from Training of Drilling Teams with Focus on Realistic Downhole Feedback** 1171  
*Sven Inge Ødegård, eDrilling Solutions; Bjørn T. Risvik, Statoil; Knut S. Bjørkevoll, SINTEF Petroleum Research; Øystein Mehus, Oiltec Solutions; Rolv Rommetveit, eDrilling Solutions; Morten Svendsen, eDrilling Solutions*
- SPE/IADC 163511 **Qualification and Field Trial of a Metal Expandable Well Annular Barrier** 1183  
*Jan Roar Drechsler and Øystein Eikeskog, Statoil, and Paul Hazel, Ricardo Vasques, Boris Filev, Johnny Bårdsen, and Øyvind Hjorteland, Welltec*
- SPE/IADC 163512 **On the Shear Degradation of Lost Circulation Materials** 1198  
*Pietro Valsecchi, SPE, ExxonMobil Upstream Research Company*



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163513 Advanced FEA-Based Modeling System Successfully Reproduces and Solves RSS Hole Spiraling Issue 1204  
*Medhat Al Habsi, Tod Stephens, Yinka Owodunni, Al Hosn Gas, Riadh Boualleg, Yuelin Shen, Omar El Amin, Mohd Ridzuan Abd Mokhti, Phi Le, Venkat Radhakrishnan, Schlumberger*
- SPE/IADC 163514 Numerical and Analytical Investigation of Smear Effect in Casing Drilling Technology: Implications for Enhancing Wellbore Integrity and Hole Cleaning 1210  
*Salehi, S., University of Louisiana at Lafayette, Mgboji, J., Schlumberger Casing Drilling, Aladasani, A., Kuwait Oil Company and Wang, S., University of Louisiana at Lafayette*
- SPE/IADC 163515 Advances in Real-Time Event Detection While Drilling 1223  
*R. Wong, Q. Liu, M. Ringer, J. Dunlop, C. Luppens, H. Yu, and C. Chapman, Schlumberger*
- SPE/IADC 163516 Downhole Vibration Analysis: Fishing Agitation Tool Efficiency in Stuck Pipe Recovery 1230  
*Mark Voghell, Assaad Mohanna, Christopher Hanley, Cristinel Al-Khiriseh, National Oilwell Varco; Ahmed Al-Mousa, Ali Al-Amri, Saudi Aramco*
- SPE/IADC 163517 The Next Step in Conventional Reciprocating Mud Pump Technology 1242  
*Gregg Berryhill, Weatherford, Andy Shelton, Weatherford*
- SPE/IADC 163518 Safely Exceeding Buckling Loads in Long Horizontal Wells: Case Study in Shale Plays 1248  
*S. Menand, DrillScan US Inc., D. C-K Chen, Hess Corporation*
- SPE/IADC 163519 Evaluation of Filter Cake Mineralogy in Extended Reach and Maximum Reservoir Contact Wells in Sandstone Reservoirs 1261  
*B. S. Ba geri, SPE, A. A. Al-Majed, SPE, KFUPM, S.H. Al-Mutairi, SPE, Saudi Aramco, A. Ul-Hamid, SPE, and A.S. Al-Sultan, SPE, KFUPM*
- SPE/IADC 163521 Pointing Towards Improved PDC Bit Performance: Innovative Conical Shaped Polycrystalline Diamond Element Achieves Higher ROP and Total Footage 1273  
*Michael Azar, Allen White, Steven Segal, Suman Velvaluri, Gary Garcia, Smith Bits, a Schlumberger Company, Malcolm Taylor, Novatek Inc.*
- SPE/IADC 163522 A New Fluid Management System and Methods for Improving Filtration and Reducing Waste Volume, Introducing a Step Change in Health and Safety in the Mud Processing Area 1283  
*Asbjørn Kroken, SPE, and Jan Kristian Vasshus, Cubility; Arild Saasen, SPE, Det norske oljeselskap and the University of Stavanger; Bodil Aase, SPE, and Tor Henry Omland, SPE, Statoil*



5–7 MARCH 2013

RAI CONGRESS CENTRE  
AMSTERDAM, THE NETHERLANDS

WWW.SPE.ORG/EVENTS/DC

THE PREMIER DRILLING EVENT

## TABLE OF CONTENTS (CONTINUED)

SPE/IADC 163523	<b>Operational Reliability Assessment of Conventional vs. MPD on Challenging Offshore Wells</b> 1293 <i>Don Hannegan, P.E., SPE, Weatherford</i>
SPE/IADC 163524	<b>New Generation Thermally Stable Cutters Deliver High Penetration Rates While Maintaining Durability in the Troll Field, Norway</b> 1303 <i>Tom Roberts, Espen Ludvigsen, Olav Hæreid, National Oilwell Varco</i>
SPE/IADC 163525	<b>Setting Free the Bear: The Challenges and Lessons of the Ursa A-10 Deepwater ERD Well</b> 1318 <i>John Gradishar, SPE, Gustavo Ugueto, SPE, Shell Upstream Americas, and Eric van Oort, SPE, The University of Texas at Austin</i>
SPE/IADC 163526	<b>Drilling Unconventional Shale Wells Remotely</b> 1333 <i>Cesar Gongora, SPE, Omar Awan, SPE, Jose Mota, SPE, Shell Upstream Americas, and Eric van Oort, SPE, The University of Texas at Austin</i>
SPE/IADC 163527	<b>Pore Pressure Evolution, Core Damage and Tripping Out Schedules: A Computational Fluid Dynamics Approach</b> 1346 <i>Izaskun Zubizarreta, Senergy Ltd., Michael Byrne, Senergy Ltd., Yelitza Sorrentino, Senergy Ltd., Elinor Rojas, Senergy Ltd.</i>
SPE/IADC 163528	<b>Dust Collection System for Personnel Health During Fracturing Operations</b> 1357 <i>T. Anderson, C. Hooker, A. Uttecht, M. Boucher, N. Wagner, National Oilwell Varco</i>
SPE/IADC 163529	<b>Pivot Stabilizer Innovations for Point the Bit Rotary Steerable Systems Result in Improved Drilling Performance for Specific Applications</b> 1365 <i>Christopher Jeffery, Michael Coss, Richard Rivera, Benoit Botton, SPE, National Oilwell Varco</i>
SPE/IADC 163531	<b>BOP Performance - Developments and Consequences in a Post-Macondo World</b> 1377 <i>Jeffry P. Sattler, WEST Engineering Services</i>
SPE/IADC 163534	<b>Innovative Drilling System with a Built-in Kick-off Ramp Allows Dependable Curve Building in Granite Wash Formation</b> 1381 <i>G.A. Bruton, J. Talkington, Chesapeake Operating Inc., P. Desai, S. Swadi, J. Kelley, Schlumberger</i>
SPE/IADC 163535	<b>The Stability of a Pipe Stand Racked in a Derrick, Part 2 - A General Pipe Stand Model</b> 1389 <i>S.J. Sawaryn, SPE, BP Exploration Operating Company Ltd., P.D. Pattillo, SPE, Clover Global Solutions, LP</i>



## TABLE OF CONTENTS (CONTINUED)

SPE/IADC 163536	Innovative Rolling PDC Cutter Increases Drilling Efficiency Improving Bit Performance in Challenging Applications 1410 <i>Youhe Zhang, Ryan Baker, Yuri Burhan, Jibin Shi, Chen Chen, Sandeep Tammineni, Bala Durairajan, Jordan Self, Steven Segal, Smith Bits, a Schlumberger Company</i>
SPE/IADC 163537	Industry's First Hydro-Mechanical Surface Controlled System for Multiple Reamer Activation/Deactivation Increases Drilling Efficiency 1425 <i>Bjoern Tore Torvestad, Hans Magnus Bjoerneli, Ketil Toerge, Lars Andreassen, Schlumberger, Stein Haavardstein, ConocoPhillips, Harald Blikra, Talisman Energy Norge</i>
SPE/IADC 163538	The Combined Application of Azimuthal Deep Resistivity and Multi-Lateral Technologies Maximizes Extra-Heavy Oil Recovery and Improves Production Rates in Junin Block of the Orinoco Oil Belt 1435 <i>J. Palermo, R. Gutierrez, J. Ramos, and O. Toledo, PVDSA Petrocedeño, and W. Garcia, L. Rondon, D. Cohen, and O. Mendez, Halliburton</i>
SPE/IADC 163544	Performance of Thermal Cements with Different Weighting Materials 1444 <i>Jean-Philippe Caritey, SPE, and Jason Brady, SPE, Schlumberger</i>
SPE/IADC 163545	Surge and Swab Effects Due to Vessel Heave in Deepwater Wells: Model Development and Benchmarking 1453 <i>Sharat Chandrasekhar, SPE, Blade Energy Partners, William Bacon, SPE, Blade Energy Partners, Benni Toldo, SPE, Woodside, P. V. Suryanarayana, SPE, Blade Energy Partners</i>
SPE/IADC 163546	Anatomy of MPD Well Failures: Lessons Learned from a Series of Difficult Wells 1474 <i>B. Dow, SPE, Schlumberger, J.Baker, Schlumberger, P.Spriggs, SPE, Grass Skirt Oilfield Consulting, and A.Voshall, SPE, Carlson Pilot</i>
SPE/IADC 163547	Microwave Heating: A Feasible Alternative for Drilled Cuttings Drying in Offshore Environments 1484 <i>M. S. Pereira, C. H. Ataide, Federal University of Uberlândia; R. Naufel, Ondatec, C. M. A. Panisset, C. H. M. Sa, A. L. Martins, Petrobras</i>
SPE/IADC 163548	A Brief History of the Shell "Soft Torque Rotary System" and Some Recent Case Studies 1492 <i>D.J. Runia, Shell Intl. E and P Co.; S. Dwars, Shell Intl. E and P Co.; I.P.J.M. Stulemeijer, Consultant</i>
SPE/IADC 163549	Perforating Gunshock Loads - Prediction and Mitigation 1502 <i>Carlos Baumann, Angel Lazaro, Paulo Valdivia, and Harvey Williams, SPE, Schlumberger, Paulo Steccolini, SPE, OGX</i>



## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163550 **Deepwater Well Control - An Important Way Forwards** 1520  
*Colin Leach, Jim Mounteer, Argonauta Drilling Services L.L.C.*
- SPE/IADC 163552 **From Research to Practice: A Story of an Actionable Safety Leading Indicator Index** 1533  
*Joe Stough and Nathan Robinson, IHS*
- SPE/IADC 163555 **Energy Storage for Natural Gas Fueled Electric Drilling Rigs** 1545  
*Richard Thompson, KRW Technologies; Brian Murphy, Ensign Energy Services, Inc.; Kevin Williams, KRW Technologies; Hugh Giberson, Ensign Energy Services, Inc.; Jim Garaghty, KRW Technologies; Gary Pace, KRW Technologies*
- SPE/IADC 163557 **Annular Pressure Build-up Analysis and Methodology with Examples from Multifrac Horizontal Wells and HPHT Reservoirs** 1562  
*Jonathan Bellarby, SPE, Cammore Consulting Ltd, Sara Sparre Kofoed and Franz Marketz, SPE, Maersk Oil*
- SPE/IADC 163558 **Fit-for-Purpose BHA Design for Drilling Complex Wells Offshore Brunei Leads to New Industry Benchmark** 1574  
*B. Legarth, SPE, S. Dustin, J. Montero, SPE, Brunei Shell Petroleum Co. Sdn. Bhd., J. Walker, SPE, R. Mulligan, C. Maeso, Schlumberger*
- SPE/IADC 163559 **Performance and Cost Benefits of Environmental Drilling Technologies: A Business Case for Environmental Solutions** 1592  
*Lydia Brantley, Jennifer Kent, Natalie Wagner, SPE, National Oilwell Varco*
- SPE/IADC 163560 **A Summary of Wired Drill Pipe Field Trials and Deployments In BP** 1598  
*Stephen T. Edwards, Chris J. Coley, Nick A. Whitley, Richard G. Keck, Vishwahnath Ramnath, Tommy Foster, Keith Coghill, Mark Honey, BP*
- SPE/IADC 163561 **Technological Innovation in Riser Tensioner Design Significantly Reduces Risk of Tensioner Overpull and Likelihood of Catastrophic Events** 1628  
*Bob Watts, David Trent, DTI LLC*
- SPE/IADC 163562 **New Technology Enhances Rotary Steerable System Performance and Provides Superior Borehole Quality and Reduces Vibration in Rotary Steerable Applications** 1631  
*S. Barton, D. Herrington, M. Gaines, R. Morrison, NOV, D. Stroud, L. Lines, Weatherford*
- SPE/IADC 163563 **Obtaining both Horizontal Stresses from Wellbore Collapse** 1639  
*Bernt S. Aadnoy, SPE, Federal University of Rio de Janeiro, Eirik Kaarstad, SPE, University of Stavanger and Clemente J. de Castro Goncalves, SPE, Petrobras CENPES*



5-7 MARCH 2013

RAI CONGRESS CENTRE  
AMSTERDAM, THE NETHERLANDS

WWW.SPE.ORG/EVENTS/DC

THE PREMIER DRILLING EVENT

## TABLE OF CONTENTS (CONTINUED)

- SPE/IADC 163565 Little Things, Big Effect- Identifying Causes and Addressing Vibrations Issues in Challenging Deepwater Applications 1651  
*Graham Mensa-Wilmot, Paul Benet, Devanand Ramchune and Blake Maddoux - Chevron Corp*
- SPE/IADC 163566 Dynamic Model for Stiff String Torque and Drag 1665  
*Vadim Tikhonov, SPE, Khaydar Valiullin, SPE, Albert Nurgaleev, SPE, Lev Ring, SPE, Raju Gandikota, SPE, Pavel Chaguine, SPE, Curtis Cheatham, SPE, Weatherford*
- SPE/IADC 163567 The Use of Along String Annular Pressure Measurements to Monitor Solids Transport and Hole Cleaning 1681  
*Christopher J. Coley, BP, Stephen T. Edwards, BP*
- SPE/IADC 163568 Expandable Liner Hanger Milling: North Sea Case Histories 1716  
*Thomas Berge, Kim Daniel Mathisen and Olav Storebø, Halliburton; Michael Muir, Maersk*
- SPE/IADC 163570 System Reliability and Metrics for High-Speed Networked Drillstring Telemetry and Along String Evaluation 1721  
*Raymond McCubrey, Aaron Johnson, Rhys Adsit, Daan Veeningen, David Pixton, NOV IntelliServ*
- SPE/IADC 163571 Pipe-Handling Integration in Land Drilling Operations - Safety Review, Operational Drivers, and Field Performance Feedback 1729  
*Joel Heinen, Tom Yost, National Oilwell Varco; Mike Garvin, Patterson-UTI*
- SPE/IADC 163572 A New Measurement While Drilling System Designed Specifically For Drilling Unconventional Wells 1738  
*S.J.Krase, P.R. Harvey, M.W.White, T.G. Earl; Navigate Energy Services, LLC*
- SPE/IADC 163573 BOP Testing - Qualification Tests, Test Facilities and the Efficient Means of Operating Them 1745  
*F.B. Springett, C. Johnson, M. Shah, National Oilwell Varco*