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**2012 SPE/IADC**  
**Managed Pressure Drilling &**  
**Underbalanced Operations**  
**CONFERENCE & EXHIBITION**



20-21 March 2012 • Marriott Hotel • Milan

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## TUESDAY, 20 MARCH 2012

### 7:00 CONFERENCE REGISTRATION

Foyer

### COFFEE SERVICE & OPEN EXHIBITION

Salone Washington B

### 8:15 WELCOME & INTRODUCTION

Salone Washington A

- Dag Ove Molde, *Chair, IADC UBO & MPD Committee, Principal Engineer, Statoil*

### 8:30 KEYNOTE PRESENTATION

#### Continuous Circulation Systems – The Key for Safer and Faster Drilling

Angelo Ligrone, *Vice President Drilling Technologies, eni*

One of today's most frequent questions in the oil industry is: is it possible to drill faster and safer? Can we balance the need to meet safety and operating performance? MPD systems along with continuous circulation systems can be a key element to solve this dilemma, in particular in certain drilling environments where high operating costs come along with operating risks that are not negligible. The presentation will provide eni's perspective about this topic.

#### 9:00 MPD & UBO – HOW TO GET IT RIGHT – THE GOOD STUFF

Moderator: Sara Shayegi, *Senior Well Engineer, Shell*

Industry experts will examine key points that have not been completely understood about MPD, UBO and its applications. These experts will impart knowledge of the most important things you should know about this technology in specific areas.

- John Kozicz, *Technology Manager, Transocean*
- Donald Reitsma, *Vice President Technology, Schlumberger*
- Patrick Brand, *Executive Vice President Operations, Blade Energy Partners Ltd.*
- Charlie Weinstock, *Senior Drilling Superintendent, Chevron*

### 10:00 NETWORKING BREAK & OPEN EXHIBITION

#### 10:30 MPD FROM FLOATING RIGS

Session Chair: John Kozicz, *Technology Manager, Transocean*

#### Stena "Advance" MPD Drilling Semi-Submersible

Gavin Humphreys, *New Business and Technology Manager, Stena Drilling Ltd.*

MPD drilling technology is currently not available from semi-submersible drilling rigs and is needed for improved production profiles and ultimate reserves recovery from subsea developed fields. Stena Drilling will describe how full MPD drilling capability will be introduced and integrated into all their new build semi-submersible rigs.

#### Handling Severe Heave for MPD on Floater

Alexey Pavlov, *Principal Researcher, Glenn-Ole Kaasa, Statoil; Ingar Landet, Ole Morten Aamo, Norwegian University of Science and Technology*

Severe heave motion of the rig is a limiting factor for MPD on floaters in the North Sea. During drilling it is compensated by the draw works. During connections the heave compensation is turned off and the drill string moves with the rig following its heave motion and causing large pressure fluctuations downhole. In this work we present some results on Statoil's development of MPD pressure control system for handling severe heave conditions typical for the North Sea. The presentation covers both experimental results from full scale tests and simulations of a new control system for compensating the heave effects with the MPD choke.

#### Utilizing MPD To Drill HP/HT Deepwater Exploration Wells

Tom Scoular, *Technical Review Manager, Kevin Hathaway, Wael Essam, Karlin Costa, Scott A. Johnson, Andrew W. Phillips, Andy Rawcliff, BP; David Burton, Consultant (SPE/IADC 156912)*

A successful use of MPD techniques from a semi-submersible rig in an HPHT drilling operation offshore Egypt is described. Included is a discussion on

the MPD techniques and experience developed on jack-up HPHT drilling operations and how these were successfully transferred across to the floating rig operation. The presentation will discuss the rig modifications required to install the MPD equipment on the semi-submersible, including installation of the rotating head in the marine riser. It will also review the operations carried out utilizing MPD techniques, and give examples of how the equipment was used in the drilling of the last 3 hole sections. Some key areas considered essential to the success of this technology on a floating rig in a demanding HPHT environment and the benefits associated with the MPD operation are highlighted.

#### Case History: PMCD Implemented To Explore a Carbonate Reservoir From a Semisub in Malaysia Results in a Safe and Economical Drilling Operation

Fernando Gallo Zapata, *Drilling Engineer, F. Rojas, Atul Singh Bhadauria, Schlumberger; L. Umar, Intan Azian Aziz, A. Hassan, Petronas (SPE/IADC 156905)*

@Balance – Schlumberger successfully implemented the PMCD technique from a semi sub to reduce risk and safely reach the exploration target successfully. The case history of this well is presented, including procedures and engineering calculations performed for the planning of the job.

### 12:30 LUNCHEON & OPEN EXHIBITION

Le Baron & Salone Washington B

### 13:30 MPD ON HPHT APPLICATIONS

Session Chair: Clayton Mykytiw, *Technology and Performance Team Leader, HESS*

#### Managed Pressure Drilling Technology Utilized To Mitigate Drilling Hazards in an H<sub>2</sub>S Bearing Formation in Kurdistan, Iraq

Paco Vieira, *Engineering Manager, Iman Ketabchi, Fabian Torres, Weatherford (SPE/IADC 156891)*

This paper describes the Front End Engineering (FEE) design, project & operational results from this project for the first Sterling Exploration well to mitigate drilling hazards in a H<sub>2</sub>S bearing formations in Kurdistan, Iraq.

#### Use of a Continuous Circulation System on the Kvietbjorn Field

Neil Ross, *MPD Business Development Engineer, National Oilwell Varco; Per Cato Berg, Statoil; Tim Scaife, Robin Macmillan, National Oilwell Varco, (SPE/IADC 156899)*

The reasons behind Statoil choosing to add continuous circulation to HPHT operations at the Kvitebjorn Field in the North Sea are explained. Results recorded by the drilling team during the drilling period are described. The presentation will also explain the additional equipment and manpower required to enable continuous circulation to be installed and operated at the worksite.

#### Demonstrating the Value of Integrating FPWD Measurements With Managed Pressure Drilling To Safely Drill Narrow Mud Weight Windows in HP/HT Environment

Ahmed Waguih, *Project Manager, Freddy Rojas, Scott Fey, Bramanta Subroto, Greg Garcia, Schlumberger; Lawrence Uman, Intan Azian, Noor Azree, Rahim Ali, Petronas (SPE/IADC 156888)*

The process applied to obtain a successful MPD application with FPWD on a HPHT well is outlined: Rig Site Survey on a HPHT Jack-up rig, Training, HPHT / MPD Well Control Workshop, Hazid / Hazop study, Engineering, Execution and procedures, conclusions and recommendations.

### 15:00 NETWORKING BREAK & OPEN EXHIBITION

#### 15:30 EXPLORATION AND RESERVOIR CHARACTERIZATION

Session Chair: Kristin Falk, *Senior Manager MPD Control Solutions, Ocean Riser Systems*

#### The First Conjunction of UBD and Coring Applications in MENA Utilized for a Maximum Formation Characterization Output in KOC: Planning, Execution and Results

Saleh T. Muqem, *Senior Drilling & Workover Engineer, Ayad Al Kandari, Mohannad Al-Mohailan, Suad Juma, Iqbal Hussain, Anand Pravanda, Bader Jawhar, Kuwait Oil Company; Naiem Barakat, Hani Qutob, Paco Vieira, Weatherford; Dietmar Bochowski, Copro*

The successful UBD application in KOC which is considered as a start of under-balanced coring technology to enhance Shuaiba formation exploitation will be

described in detail. It will show the planning phase, the tools used and methodology as well as challenges encountered while executing the drilling program. Also lessons learned will be discussed.

### **Evaluation of Results From One Company's Global Use of Underbalanced Drilling for Tight Gas Exploration and Appraisal Reservoir Characterization**

*Dave Elliott, UBO/MPD Engineer, Shell (SPE/IADC 156897)*

Since 2008 Shell has successfully deployed UBD for tight gas exploration and appraisal on 10 projects in North America, North Africa, the Middle East and Asia. An evaluation of the strategic learning's from this deployment of UBD will be outlined. Evaluation scope will include HSE, project delivery issues, reservoir learning's and changes to sub-surface team's work flows to exploit the information. Selected project results will be presented to support the evaluation conclusions.

### **16:30 MPD AND FLUID DESIGN**

*Session Chair: Kristin Falk, Senior Manager MPD Control Solutions, Ocean Riser Systems*

### **A Thixotropic Barrier Fluid Used To Prevent the Commingling of Fluids While Tripping on Managed Pressure Drilling Wells**

*Jay Turner, Global Technical Services Manager, Ryan Riker, Randy Lovorn, Halliburton (SPE/IADC 156904)*

A brief description of current techniques used for maintaining consistent BHP while tripping including special equipment required. The specific challenges of tripping with a mud cap will be addressed including the application of a barrier fluid to optimize the operation. Characteristics of the barrier fluid including lab data and field data will be provided. A short operational summary depicting the logistical considerations, additional specialized equipment required, and observed results will be attached. General rig site layout will be depicted through photos taken on location as well as samples captured during blending, prior to placing in the wellbore, and upon return to surface.

### **17:00 MPD TRAINING**

*Session Chair: Kristin Falk, Senior Manager MPD Control Solutions, Ocean Riser Systems*

### **Realistic MPD Training Through Advanced Drilling Simulator**

*Fredrik Varpe, Principal Engineer MPD/UBD, Bjørn Risvik, Dag Ove Molde, Statoil; Svein Hovland, Sintef*

The contents of the simulator and the different modules contained are presented. Moreover, the added value of using a realistic simulator for planning and training MPD personnel is discussed.

### **17:30 WELCOMING RECEPTION & OPEN EXHIBITION**

*Salone Washington B*

## **WEDNESDAY, 21 MARCH 2012**

### **7:30 CONFERENCE REGISTRATION**

*Foyer*

### **COFFEE SERVICE & OPEN EXHIBITION**

*Salone Washington B*

### **8:15 OPENING REMARKS**

*Salone Washington A*

- **Dag Ove Molde, Chair, IADC UBO & MPD Committee, Principal Engineer, Statoil**

### **8:30 KEYNOTE PRESENTATION**

*Dave Elliott, UBO/MPD Principal Technical Expert, Shell*

### **9:00 MPD & UBO TECHNOLOGIES – STATE OF PLAY – THE OPERATORS PERSPECTIVE**

*Moderator: Dag Ove Molde, Chair, IADC UBO & MPD Committee, Principal Engineer, Statoil*

Confidently employing MPD and UBO technologies today worldwide, these industry leaders will discuss how they got it right!

- **Cliff Lang, Drilling & Completions Manager – Europe, Eurasia and North Africa (EENA), HESS**
- **Claudio Molaschi, Technical Leader – New Technology Development and Applications, eni**
- **Dave Elliott, UBO/MPD Principal Technical Expert, Shell**

### **9:45 NETWORKING BREAK & OPEN EXHIBITION**

### **10:15 NEW MPD TECHNOLOGIES**

*Session Chair: Gavin Humphreys, New Business & Technical Manager, Stena Drilling Ltd.*

### **Development and Field Testing of a New Fully Automated Choke Controller for Managed Pressure Drilling**

*Donald Reitsma, Vice President Technology, Yawan Couturier, Jesse Hardt, Schlumberger*

In order to provide a reliable means of increased pressure control performance, a new fully automated choke controller has been developed that replaces the traditional PID controller or variants of PID control, which are currently in use by current MPD providers. The new controller automatically self-tunes in only a few minutes, making it user friendly and then provides a robust, precise, stable and fast method of controlling the backpressure according to the provided set point pressure without interference from an operator. The required control pressure can be a single manual input, a series of manual inputs or from a real time wellbore hydraulics model. The results of testing at the Louisiana State University PERTT facility and operation on an MPD well will be presented.

### **The Application of Advanced Gas Analysis System Complements Early Kick Detection and Control Capabilities of MPD With Added HSE Value**

*Bhavin Patel, Managed Pressure Drilling Engineer, Todd Cooper, Simon Hughes, Weatherford; Will Billings, Talisman Energy (SPE/IADC 156908)*

Successful application of an advanced gas extraction system utilizing an innovative membrane technology and high speed gas chromatograph to improve surface gas detection and analysis capability during MPD operations with Micro Influx Control System. Use of advanced gas extraction system in combination with MPD system added significant HSE value by making well control operations more efficient and safer.

### **11:15 MPD APPLICATIONS**

*Session Chair: Martin Culen, General Manager Europe/Middle East/Africa, Blade Energy Partners*

### **Successful Implementations of Tophole Managed Pressure Cementing and Managed Pressure Drilling in the Caspian Sea**

*Mehdi Mir Rajabi, Senior Drilling Engineer, Roger Sverre Stave, Bjørn Rohde, Niall Maguire, AGR; Rolf Tapper, BP (SPE/IADC 156889)*

The principles of newly developed Managed Pressure Drilling and Managed Pressure Cementing techniques used to drill and cement top-hole sections in the Caspian Sea will be covered. Top-holes in this area have a number of serious risks; many of them related to the narrow pressure window, shallow water flow and dissolved gas percolation. The equipment, planning and how wellbore pressure is managed to prevent any unwanted fluid exchanges between the wellbore and formation during drilling, circulation of cement and cement setting, will be discussed.

### **Onshore US MPD Use by an Operator**

*Julio Montilva, Staff Drilling Engineer, Jose Mota, Richard Billa, Shell (SPE/IADC 156909)*

The implementation of a fully automated MPD, which incorporates a Rig Pump Diverter (RPD) that allows smooth transition from circulating to non-circulating down hole during connection while maintaining continuous rig pump circulation is described. We will show the impact of drilling with lower mud weights on well performance. A comparison of vertical and horizontal HP/HT wells that were drilled conventionally and wells drilled using MPD will be made showing the effects of drilling with lower mud weights on ROP, down hole circulating temperature, ECD, stand pipe pressure and pump rate.

### **12:15 LUNCHEON & OPEN EXHIBITION**

*Le Baron & Salone Washington B*

### **13:30 MPD KICK DETECTION & WELL CONTROL**

*Session Chair: Ray Bullock, GeoBalance Senior Technical Advisor, Halliburton*

## Near Balance Drilling Benefits Addressed Through a Blowout Probability Model

Claudio Molaschi, Drilling Technical Leader, Silvia Masi, Fabrizio Zausa, eni; Jean Michelez, Nicola Rossi, Kwantis (SPE/IADC 156911)

A brief description of the technology and the application done (on land and on semi-sub) is given. The focus will be on the risk analysis, the methodology, the results and the advantages of using this tool to mitigate blow out event probability.

## Simulator and the First Field Test Results of an Automated Early Kick Detection System That Uses Standpipe Pressure and Annular Discharge Pressure

Donald Reitsma, Vice President Technology, Schlumberger; Ian Mills, Lone Pine Resources; Zaurayze Tarique, Schlumberger (SPE/IADC 156902)

Simulator and field test results of an automated early kick detection system which evaluates standpipe and discharge pressure while monitoring drilling parameters. Indications from the field test are that the system takes less time to rig up, will be a lower cost, and require less maintenance and personnel compared to using a delta flow method with a high resolution flow meter. There will also be a discussion on further development of the system as well as incorporating choke position during managed pressure drilling operations.

## Closed Loop Circulating Systems Enhance Well Control While Increasing Drilling Efficiency?

Brian Grayson, Product Line Manager Secure Drilling Services, Weatherford (SPE/IADC 156893)

This paper examines the basics elements of a closed-loop circulating system and how this technology is enhancing the safety and efficiency of drilling and completion operations without sacrificing other operational elements.

## 15:00 NETWORKING BREAK & OPEN EXHIBITION

### 15:30 LOW PRESSURE MPD APPLICATIONS

Session Chair: Donald Reitsma, Vice President Technology, Schlumberger

## Successful Controlled Pressure Drilling Application in a Geothermal Field

Essam Sammat, Regional Business Development Manger, Stephen O'Shea, Gareth Innes, Weatherford; Julio Kemenyfy, Darko Piscevic, Geoenergie Bayern (SPE/IADC 156895)

An introduction to geothermal drilling and IADC well classification for the drilled wells is given. Included are the primary objectives of using CPD in this specific field. Planning including modeling, nitrogen and required equipment will be presented with the operation details. Conclusion and summary of the application is also included.

## Successful Use of Managed Pressure Drilling (MPD) in Low Pressure, High Temperature, and Deeper Reservoirs in Mexico South

Erwin Gomez, MPD/UBD Engineer, Marcos Chavarria, Juan Carlos Beltran, Corrado Lupio, Hermogenes Duno, Schlumberger (SPE/IADC 156892)

Proper planning and front-end applied engineering demonstrated in two multi-phase MPD operations the added value of constant bottom hole pressure tech-

nique to overcome risks associated with a nuisance gas zone, hole cleaning, holes stability and temperature fluctuations across wellbore profile in multiphase environments. Annular velocity is regarded as the most critical factor affecting hole cleaning condition in high angle wells in the absence of pipe rotation. Also, the presence of a nitrified drilling fluid system modifies the temperature profile across the well hence mud properties and coolant effects changes which lead to additional operational problems.

## 16:30 CLOSING REMARKS

**Unassigned papers of note:** The following paper proposals will be included in the conference if a scheduled paper becomes unavailable. In addition, these presentations will be made available in the SPE/IADC conference proceedings, should the author desire so.

### Modeling of Drilling Hydraulics for Safe Dual Gradient Operations

Steve Nas, Vice President Global Well Engineering, SPT Group; Kristin Falk, Øyvind Nistad Stamnes, Ocean Riser Systems (SPE/IADC 156901)

Challenges and solutions related to hydraulics modeling for partially evacuated riser dual gradient systems are presented. Particular emphasis is put on the differences between conventional subsea wells and dual gradient wells during connection, tripping and well control scenarios, and examples highlighting these differences are included.

### UB CTD Enhances Production From Low-Permeability Gas Reservoirs

Shaker Alkhamees, Superintendent, Julio Guzman, Saudi Aramco; Raj Fernandez, Baker Hughes (SPE/IADC 156898)

The Saudi Aramco experience with Under-Balanced Coiled Tubing Drilling technique for re-entering Deep Gas Wells is described. The presentation includes the main drivers for Saudi Aramco, the methodology for selecting candidates and the technology used to overcome the challenges presented by the operational conditions in Deep Gas wells.

### Drilling Hazard Mitigation Technology Enables Conventionally Undrillable Prospects To be Drilled With Reduced Nonproductive Time and Increased Operational Safety: Application of Solid Expandable Liners and Managed Pressure Drilling in Algeria Nezza Field

Fabian Torres, MPD Technical Manager – MENA Region, Marc Saad, Weatherford; K. Kartobi, Sonatrach (SPE/IADC 156907)

The Nezza Field is a faulted anticline that makes the conventional drilling challenging due to the presence of fractured and high pressure formations, representing operational hazards for the drilling process. This adverse condition was observed in the offset wells drilled with problems related to wellbore instability, lost-circulation zones and over-pressured formations leading to kick/loss scenarios that endangered the drilling operations incurring significant NPT. A Drilling Hazard Mitigation (DHM) approach was implemented to offset the risks of both, deviating from the well objective and drilling plan.

### Natural Gas Recycle and Recovery System Dramatically Reduces Drilling Cost and Environmental Impact

Alek Ozegovic, Engineering Manager Secure Drilling Services, Rich Norton, Weatherford

Underbalanced drilling has typically been limited to utilizing inert gas injection and flaring natural gas produced from the reservoir. The natural gas recycle and recovery system is a highly engineered application that utilizes natural gas from the reservoir for injection and circulation into the drilling fluid stream to create an underbalanced condition in the well bore. Additionally, excess produced natural gas is compressed to a sales pipe line to avoid burning the produced gas so that the drilling cost and environmental impact are both reduced significantly. Recycle and recovery (R&R) system typically takes place with the recovery of return gas from the well for recompression and reinjection back into the well. The presentation demonstrates the reliability and the repeatability along with the engineering economic analysis for those wells successfully drilled with R&R system in western Canada.

## MILAN MARRIOTT HOTEL

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Single Room Euro 190, Double Room Euro 210 per room per night including breakfast and 10% VAT.

The room block will expire on 31 January 2012. After this date rooms are upon availability. Please make your room reservations directly with the hotel and make sure to mention IADC to obtain discounted rate.

## EXHIBITORS

Be sure to visit the conference exhibitors. These companies will have representatives available to answer questions and provide information.

- AGR Drilling Services
- Derrick Equipment Company
- Drillmec SpA
- Ocean Riser Systems
- Pruitt Tool Rotating Control Devices
- Schlumberger
- SPT Group
- Weatherford International Ltd

Exhibition space is still available. Please contact IADC for more information: [peggy.kersten@iadc.org](mailto:peggy.kersten@iadc.org) or call +31 24 675 2252

## PROGRAM COMMITTEE – A special thanks to the following committee members for their support in organizing the conference:

- Giovanni Botto, eni
- Robert Goodwin, National Oilwell Varco
- Ray Bullock, Halliburton
- Gavin Humphreys, Stena Drilling
- Martin Culen, Blade Energy
- John Kozicz, Transocean
- Kristin Falk, Ocean Riser Systems
- Clayton Mykytiw, Hess
- Tracy Mossman, Nexen Norge
- Egidio Palliotto, Saipem
- David Pavel, Weatherford
- Don Reitsma, Schlumberger
- Sara Shayegi, Shell
- Roger Stave, AGR Drilling Services
- Niki Bradbury, SPE
- Tamela Claborn, SPE
- Ken Fischer, IADC
- Leesa Teel, IADC

## REGISTRATION

Online registration is available at: [http://www.iadc.org/conferences/MPD\\_UBO\\_2012](http://www.iadc.org/conferences/MPD_UBO_2012)

