



Society of Petroleum Engineers

TECHNICAL PROGRAM COMMITTEE

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eDrilling Solutions

Robert Schlemmer
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SPE Applied Technology Workshop

EQUIVALENT CIRCULATING DENSITY (ECD) MANAGEMENT

1 - 4 March 2010

Shangri-La's Tanjung Aru Resort & Spa
Kota Kinabalu, Sabah, Malaysia

It is well known that in the case of wells where the pore-frac windows are narrow, managing the equivalent circulating density (ECD) becomes extremely important as well as challenging. In the presence of these narrow windows, precise management of the ECD is the difference between not fracturing the formation and not allowing influx from the well. The ECD is a function of a combination of the mud weight (MW), the rheological properties (especially the low and high shear-rate viscosities), the frictional pressure drop in the annulus and solids loading. There are abundant references in the literature, which cite that the management of circulating pressures ECD related problems becomes more acute in the case of extended reach wells (ERD). In high-temperature and high-pressure wells (HTHP), it often becomes very difficult to predict the ECD based on some assumed mud properties which end up either over- or under-predicting the actual values. Unfortunately, in wells with narrow margins both situations end up being potentially disastrous; causing either a lost circulation scenario or a well-control situation.

WORKSHOP OBJECTIVES

The objectives of the workshop are to enable operators, service companies and other organisations to improve understanding, knowledge and capability. Additionally, it will offer an opportunity to enhance awareness of the current and upcoming technologies needed to meet the challenges of ECD Management. It will also offer a platform to share knowledge from around the world on tools and practices for technically challenging applications. This will include presentations and discussions to assess key risks and opportunities.

WORKSHOP FOCUS

The workshop will:

- Introduce the concepts challenges and application areas where ECD Management is necessary.
- Highlight the importance of hole cleaning and the interaction with hydraulics.
- Consider the properties of drilling fluids and methods to optimize their impact on ECD.
- Present Managed Pressure Drilling concepts and other equipment for better control of downhole pressure.

WHO SHOULD ATTEND

This workshop will be of particular value to drilling and completions professionals, geomechanics experts and professionals from other disciplines in the oil and gas industry. Registrants will be encouraged to discuss their own case histories and experiences.

REGISTRATION DEADLINE: 19 February 2010
EARLY BIRD REGISTRATION DEADLINE: 1 February 2010
REGISTER EARLY TO SAVE RM350 (US\$100)!

EQUIVALENT CIRCULATING DENSITY (ECD) MANAGEMENT**PRELIMINARY WORKSHOP TIMETABLE**

Note: While every attempt will be made to adhere to the schedule, the status/availabilities of session topics, discussion leaders and moderators are subject to change. For updated technical agenda information, please visit the SPE website at www.spe.org/atws.

Monday, 1 March 2010

1500 hours	Hotel Check-in
1400-1600 hours	Programme Committee Meeting
1700-1900 hours	SPE Registration/Poster Set-up
1800-1900 hours	Discussion Leaders and Session Managers/ Moderators Briefing
1930 hours	Welcome Reception/Dinner

Tuesday, 2 March 2010

0700-0800 hours	Breakfast
0830-0930 hours	Session 1: Introduction/Opening/ Keynote Addresses
0930-1000 hours	Group Photo/Coffee Break
1000-1200 hours	Session 2: Introduction to Operations and Impacts of Uncontrolled ECD
1200-1300 hours	Lunch
1300-1500 hours	Session 3: Hole Cleaning and Hydraulics
1500-1530 hours	Coffee Break
1530-1730 hours	Session 4: Hole Cleaning and Hydraulics (Cont)
1730-1830 hours	Poster Session
1930 hours	Group Dinner

Wednesday, 3 March 2010

0700-0800 hours	Breakfast
0830-1030 hours	Session 5: Drilling Fluids Management
1030-1100 hours	Coffee Break
1100-1300 hours	Session 6: Well Planning and Simulation
1300-1400 hours	Lunch
Afternoon	Rest & Recreation/Networking Opportunities/Dinner on own

Thursday, 4 March 2010

0700-0800 hours	Breakfast
0830-1030 hours	Session 7: Managed Pressure Drilling
1030-1100 hours	Coffee Break
1100-1300 hours	Session 8: Case Histories
1300-1400 hours	Lunch
1400-1600 hours	Session 9: Upcoming and Near Future Technologies
1600-1630 hours	Coffee Break
1630-1730 hours	Session 10: Summary/Wrap Up
1830 hours	Group Dinner

Friday, 5 March 2010

0730-1030 hours	Breakfast at Leisure
1200 hours	Hotel Check-Out

POSTER SOLICITATION AND INFORMATION

As an adjunct to the scheduled presentations, the Programme Committee will incorporate a poster presentation session in this Workshop. The poster session will allow participants an opportunity to present additional new ideas to those interested. The poster session is scheduled from **1730 - 1830 hours** on **Tuesday, 2 March 2010**.

All participants are encouraged to prepare and bring a poster presentation to the Workshop. Posters will be on display for the entire Workshop period and provide participants an excellent opportunity for networking. As with the session discussions, the poster session will be conducted off the record to encourage frank discussion and presentation of unconfirmed or partial results. Presentations on both research and field experience are solicited.

SPE WORKSHOPS AND COMMERCIALISM

The Workshop Programme Committee has a stated policy against the use of commercial trade names, company logos, or language that is commercial in tone.

Note that the Workshop Programme Committee will review all posters prior to display, and reserves the right to refuse permission to display any poster considered by the committee to be commercial in nature.

The poster display should be designed for eye-level viewing and made from simple graphic materials. Size of the poster board will be advised at a later time. The poster display may include printed materials, tables, graphs, photographs, or illustrations. All the materials should be of sufficient size so as to be easily read and should be prepared in a manner that will accomplish the following:

- Identify topic by title, presenter, affiliation, address, and phone number.
- Include a brief abstract that summarises the technology to be addressed.
- Make the display as self-explanatory as possible.
- Place the information sequentially; beginning with the main idea or problem, method used, result, etc. (Draw a plan keeping the size and number of illustrations in mind).
- Keep illustrations simple by using charts, graphs, drawings, and pictures to create interest and visually explain a point.
- Use contrasting colours.
- Use large print for narrative materials. (We suggest a minimum of 24 points or 3" high letters for the title).

Whether or not you elect to participate in the poster session or have been invited by the Programme Committee to present during one of the regular sessions, please come prepared to participate actively in the discussions. Open interaction is encouraged. With the full cooperation and participation of all attendees, we anticipate an outstanding Workshop.

EQUIVALENT CIRCULATING DENSITY (ECD) MANAGEMENT**PRELIMINARY TECHNICAL AGENDA****Tuesday, 2 March • 1000-1200 hours****SESSION 2: INTRODUCTION TO OPERATIONS AND IMPACTS OF UNCONTROLLED ECD****Session Co-Chairpersons/Moderators:****Stuart Smith**, PETRONAS Carigali Sdn. Bhd.
Colin Leach, Argonauta Drilling Services.

1. Operations and Completions:
 - Extended Reach Drilling
 - Deepwater Drilling
 - HTHP (High Mud Gradient) Wells
 - Mature Fields
2. Uncontrolled ECD
 - Fracture Charging (wellbore “ballooning”, “breathing.”)
 - Lost Circulation.
 - Well Security – Influx.
 - Differential Sticking
 - Hole Cleaning
 - Cementing
 - Impact on Completions

Tuesday, 2 March • 1300-1500 hours**SESSION 3: HOLE CLEANING AND HYDRAULICS****Session Co-Chairpersons/Moderators:****Ole Iacob Prebensen**, M-I Swaco
Terry Hemphill, Halliburton
Robert Schlemmer, Scomi

- Flow Rates
- Measurement
- Well Supervision and Monitoring
- Hole Cleaning Regime
- Downhole Tools

Tuesday, 2 March • 1530-1730 hours**SESSION 3: HOLE CLEANING AND HYDRAULICS (CONTINUE)****Wednesday, 3 March • 0830-1030 hours****SESSION 5: DRILLING FLUIDS MANAGEMENT****Session Co-Chairpersons/Moderators:****Michael Bartsch**, Scomi Oiltools
Ong See Hong, GMI (Geomatrix Experts)
Stuart Smith, PETRONAS Carigali Sdn. Bhd.

1. Control of drilling fluid rheology. Reduction of NADF in:
 - Emulsifier Mix.
 - Organo – Clay.
 - Change in weighting material.
2. Fracture Packing and Wellbore Strengthening

Wednesday, 3 March • 1100-1300 hours**SESSION 6: WELL PLANNING AND SIMULATION****Session Co-Chairpersons/Moderators:****Bjørn-Tore Anfinnsen**, SPT Group
Colin Leach, Argonauta Drilling Services
Ole Iacob Prebensen, M-I Swaco
Rolv Rommertveit, eDrilling Solutions

- Hydraulic and Hole cleaning (Balancing Trade Offs)
- Well Control
- Simulations
- Optimised Procedures
- Communication Responsibilities
- Contingency Planning

Thursday, 4 March • 0830-1030 hours**SESSION 7: MANAGED PRESSURE DRILLING****Steve Nas**, Weatherford**Kashif Malik**, Schlumberger**Rolv Rommertveit**, eDrilling Solutions

- Deepwater
- Continuous Circulation Tools
- Managed Pressure While Drilling
- Pressure While Drilling

Thursday, 4 March • 1100-1300 hours**SESSION 8: CASE HISTORIES****Session Co-Chairpersons/Moderators:****Guillaume Plessis**, NOV Grant Prideco
David Carr, Weatherford

- Best Practices
- Lessons Learned
- Practical Applications

Friday, 5 March • 1400-1600 hours**SESSION 9: UPCOMING AND NEAR-FUTURE TECHNOLOGY****Session Co-Chairpersons/Moderators:****Rolv Rommertveit**, eDrilling Solutions
Steve Nas/David Carr, Weatherford
Kashif Malik, Schlumberger

- Wired Drill Pipes
- Automatic Mud Measurements
- Real-Time Automatic Mud Window Updating
- Reel-Well

Documentation:

1. Proceedings will not be published; therefore, formal papers and handouts are not expected from speakers.
2. Work in progress, new ideas, and interesting projects are sought.
3. Professionally-prepared visual aids are not required; handwritten viewgraphs are entirely acceptable.
4. Note-taking by participants is encouraged. However, to ensure free and open discussions, no formal records will be kept.

Workshop Deliverables:

- The committee will prepare a full report containing the highlights of the Workshop discussions. This report will be circulated to all attendees. A one-page summary will be prepared by the Workshop Co-Chairperson, which will be posted on the SPE Web Site, and published in the Journal of Petroleum Technology (JPT), if space permits. The copyright of the Summary Report will belong to SPE.
- PowerPoint presentation materials will be posted on a specific SPE URL address after the Workshop. Provision of the materials by the discussion leaders will signify their permission for SPE to do so.

Commercialism:

In keeping with ATW objectives and the SPE mission, excessive commercialism in posters or presentations will not be permitted. Company logos must be limited to the title slide and used only to indicate the affiliation of the presenter and others involved in the work.

Attendance Certificate:

All attendees will receive an attendance certificate attesting to their participation in the Workshop. This certificate will be provided in exchange for a completed Workshop Questionnaire.

Continuing Education Units:

This workshop qualifies for SPE Continuing Education Units (CEU) at the rate of 0.1 CEU per hour of the ATW.

Attendees' Information:

General and detailed accommodation information will be forwarded to registrants with the attendee package prior to the scheduled Workshop, in February 2010.

Transportation/Visa:

All delegates are advised to book their international airline tickets early from their country to Kota Kinabalu, Sabah, Malaysia. Further detailed transportation information will be available and included in the attendee package upon registration. All travelers to Malaysia must be in possession of passport valid for at least six (6) months with proof of onward passage, either return or through tickets. Please check with your travel agent for information on visa requirements to Malaysia.

Dress Code:

Casual clothing is recommended. The Workshop atmosphere is informal.

Workshop Venue:

Shangri-La's Tanjung Aru Resort & Spa
No. 20, Jalan Aru, Tanjung Aru, 88100 Kota Kinabalu
Sabah, Malaysia.

REGISTRATION FEES:**Early Bird Registration Deadline: 1 February 2010**

- **SPE MEMBER: RM 8,225.00 (US\$2,350.00)/person**
- **NONMEMBER: RM 8,575.00 (US\$2,450.00)/person**

Registration Deadline: 19 February 2010

- **SPE MEMBER: RM 8,575.00 (US\$2,450.00) /person**
- **NONMEMBER: RM 8,925.00 (US\$2,550.00)/person**

Fee includes the following:

- Three-day registration fee for all Workshop sessions;
- Four nights accommodation based on single occupancy with arrival Monday, 1 March 2010 and departure Friday, 5 March 2010
- Welcome reception followed by dinner (Monday Evening);
- Three meals per day except on Wednesday
- Daily coffee/tea breaks;
- Workshop Workbook and Certificate of Continuing Education Unit (CEU);

Note: Registration fee does not include hotel accommodation and meal costs for additional family member(s).

Registration Policy:

- Registration fee **MUST** be paid in advance for attending the Applied Technology Workshop.
- Full Fixed fee is charged regardless of the length of time that the registrant attends the Workshop.
- Fixed fee cannot be prorated or reduced for anyone (Workshop chairpersons, committee members, speakers, discussion leaders, students and registrants).
- Attendees are expected to attend all Workshop sessions and are not permitted to attend on a partial basis.

Cancellation & Refund Policy:

- A processing fee of **RM525.00 (US\$150.00)** will be charged for cancellation received before the registration deadline **19 February 2010**.
- For cancellation received after the registration deadline **19 February 2010**, a 25% refund will be made to the registrant.
- No refund on cancellation received seven (7) days prior to the starting of the Workshop date, on or after **22 February 2010**.
- Substitutions will not be accepted without prior Programme Committee approval.
- **No refund** will be issued, if a registrant fails to show up at the Workshop on-site.

**ATTENTION NON-MEMBERS:
JOIN SPE DURING THIS WORKSHOP AND RECEIVE
YOUR FIRST YEAR'S MEMBERSHIP FREE!
SUBMIT YOUR MEMBERSHIP APPLICATION ONSITE!**

EQUIVALENT CIRCULATING DENSITY (ECD) MANAGEMENT

REGISTRATION FORM

Please Print or Type in Black Ink

SPE Member: Yes Membership No. _____ No

Name: _____
(First/Forename) (Middle) (Last/Family Name)

Position: _____

Company: _____

Address: _____

Town/City: _____ Zip/Postal Code: _____ Country: _____

Tel: _____ Fax: _____

E-mail: _____

Would you be willing to give a brief (10 minute) presentation ____ (Yes/No) or a poster presentation ____ (Yes/No)

If yes, please provide a title and a detailed description of the presentation in the space below. (Use additional paper if required). One of the Programme Committee members will contact you to discuss your presentation.

Important: Registrants for SPE Applied Technology Workshops are accepted on the basis of information submitted by each registrant.

Technical Disciplines (Check One)

- | | |
|--|--|
| <input type="checkbox"/> Drilling and Completions | <input type="checkbox"/> Health, Safety, Security, Environment and Social Responsibility |
| <input type="checkbox"/> Management and Information | <input type="checkbox"/> Production and Operations |
| <input type="checkbox"/> Projects, Facilities and Construction | <input type="checkbox"/> Reservoir Description and Dynamics |

Primary Responsibility (Check One)

- | | | | | |
|------------------------------------|-------------------------------------|------------------------------------|---------------------------------------|--------------------------------------|
| <input type="checkbox"/> Drilling | <input type="checkbox"/> Economics | <input type="checkbox"/> Geology | <input type="checkbox"/> Geophysics | <input type="checkbox"/> Management |
| <input type="checkbox"/> Operation | <input type="checkbox"/> Production | <input type="checkbox"/> Reservoir | <input type="checkbox"/> Surveillance | <input type="checkbox"/> Other _____ |

List background and experience. (Use additional paper if required).

List your expectation for the Workshop, so that the committee can tailor a portion of the Workshop to answering attendees' concerns. (Use additional paper if required).

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- SPE MEMBER: RM 8,225.00 (US\$2,350.00)/person**
 NONMEMBER: RM 8,575.00 (US\$2,450.00)/person

Registration Deadline: 19 February 2010

- SPE MEMBER: RM 8,575.00 (US\$2,450.00)/person**
 NONMEMBER: RM 8,925.00 (US\$2,550.00)/person

Fee includes workshop registration, workbooks, certificate, 4 nights SINGLE accommodation with daily breakfast, 1-welcome reception/dinner, 3 luncheons, 2 dinners and daily coffee breaks.

PAYMENT BY CREDIT CARD

Credit Card Payment will be in U.S. Dollars only

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> American Express | <input type="checkbox"/> Master Card |
| <input type="checkbox"/> Visa | <input type="checkbox"/> Diners Club |

Card Number

Exp. Date

CVV Code

(CVV code is the 3 digit code on back of VISA/MasterCards and the 4 digit code on the front of American Express.)

PAYMENT BY CHEQUE

- Malaysian ringgit Cheque to SPE-Asia Pacific (M) Sdn. Bhd.
U.S. Dollars Cheque to **Society of Petroleum Engineers.**
- Payment Enclosed (Check No. _____)

Signature (as it appears on your credit card)

Name as it appears on Card _____

Billing address of Card _____

Zipcode/Postal Code of Card _____

Note: Forms will not be processed and space cannot be guaranteed unless accompanied by payment for total amount due.

CANCELLATION POLICY:

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- Cancellation received after the registration deadline, **19 February 2010** a 25% refund will be made to the registrant.
- No refund** on cancellation received seven (7) days, **22 February 2010**, prior to the starting of the Workshop date.
- Substitutions will not be accepted without prior Programme Committee approval.
- No refund** will be issued, if a registrant fails to show up at the Workshop.

THIS FORM MAY BE USED AS A COMPANY INVOICE

Mail completed registration form with remittance and any supporting material to:

Society of Petroleum Engineers
Suite 23-02, Level 23, Centrepoin South, Mid Valley City
Lingkar Syed Putra, 59200 Kuala Lumpur, Malaysia
Tel: +60.3.2288.1233 • Fax: +60.3.2284.9220 • E-mail: spekl@spe.org

**To submit your registration online, please visit the SPE website at www.spe.org
The online payments are secured by VeriSign.
(Credit Card Registration Only)**

EQUIVALENT CIRCULATING DENSITY (ECD) MANAGEMENT

POSTER PARTICIPATION FORM

You are invited to prepare a poster display for presentation. If you are interested in participating, please complete the form and return it to the SPE Asia Pacific Office (Kuala Lumpur, Malaysia), address as indicated below by **19 February 2010**.

(Please print in black ink)

DATE: _____

SPE Member: Yes Membership No. _____ No

NAME: _____

POSITION: _____

COMPANY: _____

ADDRESS: _____

TELEPHONE: _____ **FAX:** _____

E-MAIL ADDRESS: _____

Please provide the topic with a short abstract of the proposed poster:

Topic: _____

Abstract: _____

PLEASE RETURN THE POSTER PARTICIPATION FORM BY 19 February 2010 TO:

Clement Law, SPE Event Coordinator
Society of Petroleum Engineers
Suite 23-02, Level 23, Centrepoint South, Mid Valley City
Lingkaran Syed Putra, 59200 Kuala Lumpur, Malaysia
Tel: +60.3.2288.1233 • Fax: +60.3.2282.1220
E-mail: claw@spe.org • Web Site: www.spe.org/atws