

# SPE WORKSHOP



Society of Petroleum Engineers

19-20 Apr 2017

DoubleTree by Hilton Hotel Houston - Greenway Plaza | Houston, Texas, USA

## The Great Drilling Automation Debate

Drilling automation is no longer a blue-sky concept alive only on a company's technology plan. However, despite an ever increasing list of implementation initiatives, widespread adoption has been slow. With only the best crews on the job today, the argument that these folks can beat the machine has become more prevalent. Is this another example of short sightedness in our industry or are we on the cusp of widespread adoption of automation as activity ramps up and some crews are gone forever? Why has automation been unable to beat the best crews?

In a break with tradition, this workshop will provide opportunities to hear both sides of these and other discussions, some in true debate style. Through sessions geared at addressing tough discussions led by informed and experienced speakers, the workshop will likely provide new perspectives on the way forward as we enter the next phase of challenges posed by the new drilling reality.

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# The Great Drilling Automation Debate

## TECHNICAL AGENDA

WEDNESDAY, 19 APRIL

All technical sessions are located in the Greenway Ballroom.

**0700-0800** | Registration Check-In  
*Greenway Ballroom Foyer*

Continental Breakfast  
*Century Ballroom*

**0800-0830** | **Keynote Address: Will Automation Be a Competitive Differentiator?**

**Jonathan Crane**, VP Wells Technology  
Deployment & Tech. Services, Shell

**0830-1000** | **Session 1: The DSATS Trajectory – Onward, Upward, or Course Correction Required?**

Session Chairs: **Moray Laing**, SAS  
**Michael Behounek**, Apache  
**John Macpherson**, Baker Hughes

In this first session, the past, present, and future chairpersons of Drilling Systems Automation Technical Section (DSATS) will set the stage for the great debate by presenting the work done by DSATS over the past 10 years in support of automating of the drilling process. The session will act as an open forum to workshop attendees to both critique and propose future efforts for DSATS in the coming years. If you feel that DSATS could do more on certain issues, this is your chance to make your point and help craft future efforts.

- **Presentation 1:** The DSATS Charter  
**Moray Laing**, SAS
- **Presentation 2:** Rig Automation, Machines and Control Systems  
**Michael Behounek**, Apache Corporation
- **Presentation 3:** Connectivity, Silos and Data  
**John Macpherson**, Baker Hughes

**1000-1030** | Coffee Break  
*Century Ballroom*

**1030-1200** | **Session 2: Drilling Systems Automation: Automation Debate - Is Automation Paying its Way?**

Session Chairs: **Arthur Hale**, Aramco Services  
**Tony Beebe**, Northern Offshore

Although the industry has been on a downturn, new technology associated with sensors, automation, equipment design and data-driven real-time solutions are potentially revolutionizing the way we approach drilling operations today and tomorrow.

There is a significant cost not only to the development of this technology but to the testing and execution of these new and potentially standardizing approaches to drilling. A debate exists as to whether such improvements are necessary are really adding to the bottom line of rig operations. In this session a panel will debate the advantages, the necessity and the economics of this new technology. The intent is for a robust debate around the pros and cons of these new operational strategies. Audience participation and a lively discussion is anticipated.

- **Presentation 1:** Case Study, SCADAdrill – Shell’s Drilling Automation Project  
**David Blacklaw**, Global Wells Automation, Shell
- **Presentation 2:** The Path Forward, Get ‘er  
**Greg Ward**, President/CEO, RigMinder
- **Presentation 3:** Performance Drilling – Objectives and Challenges to Automation  
**Graham Mensa-Wilmot**, Drilling Engineer Advisor, Chevron

**1200-1330** | Lunch  
*Century Ballroom*

**Keynote: Maximizing the Value Proposition of Rigs through Innovation**

**Subodh Saxena**, Vice President, Western Hemisphere, Nabors, Inc.

**1330-1500** | **Session 3: Drilling Systems Automation: Business Models Making the Automation Case**

Session Chairs: **Arthur Hale**, Aramco Services  
**Tony Beebe**, Northern Offshore

As stated in Session 2, sensors, automation, equipment design and data-driven solutions are revolutionizing the way we approach drilling operations today and tomorrow. This session will explore cases where an automation solution has integrated services and improved productivity, where systems automation has driven construction efficiency, and where automated rigs differentiate drilling contractors from the crowd. The audience will hear from operators and service companies that have extracted real value out from these approaches.

- **Presentation 1:** Who Am I? : Am I a Blocker to Change or an Ambassador?  
**Evelyn MacLean-Quick**, VP/Head of Global Supply Chain, Hess
- **Presentation 2:** “Closed Loop Downhole Automation” Combined with “Surface Process Control”, the Full Automation Package in Action  
**Tony Pink**, VP Dynamic Drilling Solutions, NOV

- **Presentation 3:** The Zipper Drilling System – Circulatory Hoist Enables High Efficiency, Automated Drilling Operations

**Allan Richardson**, Chief Technology Officer and **Peter Root**, R&D Manager, Warrior Manufacturing

1500-1530 | Coffee Break  
*Century Ballroom*

1530-1700 | **Session 4: What Barriers are Impeding Progress? What Drivers Accelerate Uptake?**

Session Chairs: **Blaine Dow**, Schlumberger  
**J.G. Samuel**, ConocoPhillips

A small group of industry experts have been active in drilling automation for a while. A degree of success can be claimed, particularly leading up to the beginning of the oil price collapse in 2014. Looking at historic oil price cycles, this latest lull has similarities to the 1980's, a technology renaissance period. Then, efficiency-focussed methods rose to the forefront to keep the drilling business alive. Is drilling automation leading a new renaissance? Three experts representing academia, operators, drilling contractors and service providers discuss removing barriers and delivering breakthroughs to make this happen.

- **Presentation 1:** Deployment Platform  
**Kevin Kennett**, VP Marketing, Schlumberger
- **Presentation 2:** Human Factors  
**John Thorogood**, Drilling Engineering Advisor, Drilling Global Consultant LLP
- **Presentation 3:** R&D Space  
**Eric Van Oort**, Professor, University of Texas

**THURSDAY, 20 APRIL 2017**

0700-0800 | Continental Breakfast  
*Century Ballroom*

0800-0930 | **Session 5: What are the Cooperative and Competitive Domains for Drilling Systems Automation?**

Session Chairs: **Andreas Sadlier**, Halliburton  
**John de Wardt**, DE WARDT AND CO.

The growth of industrial automation has shown us that interoperability is critical to the growth of Drilling Systems Automation (DSA). The drilling industry thrives on competition and development of proprietary innovative solutions. Where is the right balance between collaboration and competition? Data, information and control connectivity is a core to interoperability. This session will develop from big data lessons, through DSA infrastructure experiences to a discussion on standards, commercial and proprietary solutions.

- **Presentation 1:** Lessons on Collaboration and Competition in Big Data and Automation from Outside Drilling

**Satyam Priyadarshy**, Chief Data Scientist, Halliburton

- **Presentation 2:** Experiences with Establishing DSA Infrastructure on a Drilling Rig – Why We Need Standards

**Hans-Uwe Brackel**, Systems Architect, Baker Hughes

- **Presentation 3:** Standards in Action, a Drilling Rig Example – The Good, the Bad, the Ugly

**Martin Cavanaugh**, Cavanaugh Consulting Ltd.

0930-1000 | Coffee Break  
*Century Ballroom*

1000-1130 | **Session 6: Data-driven Automation – Are the Risks Real, Perceived or Just Misunderstood?**

Session Chairs: **Mark Anderson**, Shell  
**Bill Chmela**, Motive Drilling Technologies

Data-driven control solutions are all the craze these days, with “cognitive expert advisor” and “machine learning” hitting the top of 2016 Gartner’s “Hype Cycle for Emerging Technologies” report. What is their place in drilling automation? This session will explore the pros and cons of both data-driven models and physics-driven models from both inside and outside of the drilling industry. Also this session will touch on how a “black box” solution can keep the humans on the rig apprised of its decisions and how the “black box” solution can work with humans to make better decision than either a human or a “black box” system could make independently

- **Presentation 1:** Model-driven Drilling Process Automation: Design Considerations and Results from Drilling 17 Sections in the North Sea  
**Eric Cayeux**, Chief Scientist at IRIS
- **Presentation 2:** Physics-constrained Machine Learning Approach to Reduce Kick Detection False Alarm Rates by 100x  
**Mark Hibbard**, President, CoVar Applied Technologies
- **Presentation 3:** From the Enterprise to the Edge: An Examination of the Pros and Cons of Different Types of Data-driven Solutions  
**Keith Holdaway**, Advisory Industry Consultant, SAS

1130-1300 | Lunch  
*Century Ballroom*

**Presentations from the Drillbotics Student Competition by University of Texas at Austin and Missouri University of Science and Technology Students**

# The Great Drilling Automation Debate

## 1300-1430 | **Session 7: How Much Data Do We Need, at What Quality, and How Much Are We Willing to Pay?**

**Session Chairs:** **Jim McKay, BP**

**Aaron Logan, Evolution Engineering**

The industry's focus on drilling automation has created separate camps, almost right wing / left wing divisions. They are divided by either a heavy focus on data quality and rates or the other group more concerned by the trending of data to support automation. The next three to five years shouldn't be blue sky solutions, but rather pragmatic areas of automation. Near terms solutions will likely be focused on optimization or improved safety of operations. There has to be a middle ground on an advancement that brings our industry forward –the question begs to be asked, what is the optimum cost per bit of data and/or data quality from telemetry to surface and/or from surface sensors. What is the tipping point of that cost? The valuation proposition has to be strengthened to justify many of the new technologies.

- **Presentation 1:** Key Considerations for Successful Drilling Floor Automation  
**Bill O'Grady, Chief Technical Officer, Athens Group**

- **Presentation 2:** Downhole Data and Drilling Automation? A Discussion on Availability, Latency, Accuracy and Quality  
**Robert Wylie, President and CEO, xnDrilling**
- **Presentation 3:** Fundamental Data Quality Issues and Processes – Working Together to Address  
**Zoom Nguyen, Planning Engineer, ConocoPhillips**

## 1500-1630 | **Session 8: The Forward Path**

**Session Chairs:** **Moray Laing, SAS**

**Riaz Israel, BP**

**Robin Macmillan, NOV**

This interactive session will be on a collation of key workshop messages and generation of concrete take-away actions to guide the industry in drilling systems automation and well construction

## GENERAL INFORMATION

### Accessibility

Our events and functions are accessible to all attendees with wheelchairs. If you require special arrangements, please contact our staff at the registration desk.

### Alcohol Policy

SPE recognizes the legitimate serving of alcoholic beverages in the process of conducting business and social activities. We also recognize that the use and consumption of alcohol carries with it the requirement for all attendees to consume those beverages responsibly.

### Commercialism

In remaining consistent with workshop objectives and SPE guidelines, commercialism in presentations will not be permitted. Company logos should be used only to indicate the affiliation of the presenter(s).

### Continuing Education Units

Attendees will receive 1.6 CEUs. One CEU equals 10 contact hours of participation. CEUs will be awarded through SPE Professional Development for participation and completion of SPE workshop. A permanent record of a participant's involvement and awarding of CEUs will be maintained by SPE.

### Documentation

The workshop online community will contain released copies of the workshop presentations.

### Electronic Devices

As a courtesy to the speakers and your fellow registrants, please turn off all electronic devices during presentations.

### Name Badges

Please wear your badge at all times. It is a courtesy to your fellow registrants, speakers and sponsors.

### Photography and Recording Policy

SPE reserves the exclusive rights to all video/audio recording or reproductions of the workshop.

Unauthorized video/audio recording is expressly prohibited in the session room(s) or poster area, whether by video, still or digital camera, mobile phone, or any other means or form of reproduction.

Any person attending may be photographed or videotaped, and by your attendance, you give permission to use your image in possible future marketing publications including print, online, and video.

### Workshop Format

Workshops maximize the exchange of ideas among attendees and presenters through brief technical presentations followed by extended Q&A periods. Focused topics attract an informed audience eager to discuss issues critical to advancing both technology and best practices.

Many of the presentations are in the form of case studies, highlighting engineering achievements and lessons learned. In order to stimulate frank discussion, no proceedings are published and members of the press are not invited to attend.