

IADC DEC Tech Forum, “Rig for the Future”

June 24, 2020, 8:20am-12pm, Online Only



Over the years, the drilling industry has used the same methods, processes, and basic machine technology to drill oil and gas wells. Will this trend continue in the future, or is a new Rig for the Future required? What is a Rig for the Future – more of the same (evolutionary) or is it a step change (revolutionary)? What technology is required to achieve a Rig for the Future – more automation? What kind of automation? What is the cost vs. benefit of the Rig for the Future, and is it worth it? What role will rig- and office-based personnel play? Will this new technology keep people safer? Will the Rig for the Future be better for the environment and have a reduced carbon footprint? What could the Rig for the Future look like in 2030, and what are the main obstacles that must be overcome? The IADC Drilling Engineers Committee (DEC) Q2 Technology Forum is designed to explore our progress and consider our future.

NOTE: PRESENTATIONS FROM THIS ONLINE EVENT ARE NOT AVAILABLE FOR VIEWING.

Agenda:

08.20-08.25 Welcome – Dennis Moore, Chairman

08.25-08.30 Introduction to event – Robert Estes, Halliburton

08.30-09.00 **The Future of Rig Power Systems:** Marcel Snijder, Patterson-UTI Drilling Company

Efficiency of power systems on drilling rigs improved steadily over the years until the development of today’s AC rigs. Progress has since plateaued, but the increased importance of reducing emissions has renewed the drive to improve efficiency. The next major leap in efficiency will come from implementing an autonomous energy management system that manages all power production on the rig. Eco-cell is an energy storage system that uses lithium batteries and genset automation to keep gensets running at their most efficient load range. The system automatically starts and stops gensets based on the rig demand and state of charge of the batteries. This presentation describes the technology and explains how it can enable significant emissions reductions and fuel cost savings. We also explore how to target specific types of emissions reductions or unique fuel consumption objectives.

09.00-09.30 **Robotics: A Critical Partner for the Digital Revolution in the Drive to Full Automation:** Andrew McKenzie and Daniel Meinders, National Oilwell Varco

The adoption of pad drilling and an increasing demand to achieve better, faster and cheaper results on the unconventional well design has strained most onshore rigs and related equipment in the marketplace today. Over the past decade, many optimization techniques have been researched and applied. With this, an increasing gap has been propagating amongst existing rigs, which encompasses a substantial variation in equipment, controls and instrumentation. This presentation is intended to support a path toward achieving the levels of automated machine and machine control that operators require and expect regarding safely, efficiently and cost effectively executing common industry rig floor drilling tasks.

09.30-10.00 **Orchestration and Automation Support Digital Drilling Approach:** Luis G. Hernandez, Schlumberger

Over the past decade, the industry has seen a dramatic surge in the footage drilled per rig per year. This pace of drilling has added to the load on both equipment and crews, and digital technologies are proving to be increasingly necessary to meet these growing demands. Since the early years of this millennium, we have been developing digital drilling solutions that are more prescient than ever. Two key elements of our approach to digital drilling are the orchestration of the various tasks conducted at the wellsite and the automation of the driller's tasks. The orchestration component uses a digital drilling plan to coordinate the activities at the wellsite, providing the right information to the right person at the right time, while ensuring procedural adherence. The automation element uses a goal-based approach designed to be able to adapt to constantly changing drilling condition within the constraints of standard operating procedures and best practices. These approaches have been tested in the Permian basin and elsewhere and their effectiveness compared to traditional approaches.

10.00-10.30 **Driving Continuous Improvement with Robotics:** Scott Boone, Nabors

Nabors Rigs of the future are platforms for the digitalization of drilling operations designed to minimize HSE and red zone risk, provide digital workflows to drive continuous improvement, automate repetitive tasks, provide remote operations and support and integrate technologies to improve efficiency and performance. Nabors will present the CanRig Robotics robotic system for seamless operations and additional digitalization technologies.

10.30-10.45 **Break**

10.45-11.15 **Drilling Automation – Evolving Rig Control:** Ketan Bhaidasna, Halliburton

The drilling industry is in the midst of a technology revolution that is brought to the forefront due to market conditions. This presentation will explore technologies at play in traditional rig operations. We will highlight an approach for how to transition from data logging into data analytics and automated control. In addition, we will discuss the efficiency of cloud-computing and edge-computing strategies as applied to rig control. The presentation will showcase a typical top-drive control application, where changing environments in fast processes are addressed in real time. We had to overcome hardware limitations, data measurement rates, communications pitfalls, and existing infrastructure challenges to implement such an active control scheme. The need for workflow optimization and risk mitigation using over-arching collation of data, algorithms, and multiparameter real-time control is what will drive future rigs. The argument for a workflow that operates independently or without constant human oversight is a compelling attraction when it comes to saving money.

11.15-12.00 **Operator's Panel**, moderated by Robert Estes, Halliburton

In this panel session, we will hear from operators on what they would like to see from drilling contractors and service companies/OEMs over the coming decade on Rig for the Future.

Panelists:

- Willie Thompson, Drilling and Completions Engineering Manager, Hess Corp

- Michael Behounek, Senior Drilling Advisor, Apache
- Nathan Moralez, Rig Automation Engineer, BP
- John Willis, Director Drilling, Completions and Well Servicing New Mexico, Occidental Petroleum

12.00 Adjournment