

International Association of Drilling Contractors



DEC Q2 Tech Forum Meeting

26 June 2019

8 am – 1 pm

Patterson-UTI Energy
10713 West Sam Houston Pkwy N #800
Houston, TX 77064

Minutes

Agenda:

- 08.00-08.25** Refreshments and networking
- 08.25-08.30** Welcome, review agenda and JIP updates (handouts) – Dennis Moore, Marathon Oil, Chairman
- 08.30-08.45** [Video update: JIP DEC 1 “Drilling Systems Automation \(DSA\) Roadmap”](#) – John de Wardt, DE WARDT & COMPANY
- 08.45-09.00** [Video update: JIP DEC-3 “Rho Ve Method Software Concept”](#) – Matthew Czerniak, GCS Solutions
- 09.00-09.30** [Enabling Closed-loop Path Tracking Control via Digital Twin](#): Umut Zalluhoglu, Halliburton

This presentation will discuss a drilling automation platform that enables closed-loop path tracking control for intelligent rotary steerable systems (RSS). The platform replicates the wellbore propagation in real time on the surface using the digital twin of the bottomhole assembly (BHA). It can automatically provide optimal steering decisions given the BHA configuration, drill bit selection, well plan and/or geo-steering target(s), and real-time sensory information received from the RSS and other downhole and surface systems. The steering decisions can either be displayed to the directional drillers in advisory form, or automatically communicated to the tool to enable closed-loop steering control. The presentation will discuss results from the field where the drilling automation platform is tested with a new generation RSS. By exactly following automatically generated steering decisions, multiple curve sections were smoothly drilled and accurately landed within tight tolerances.

- 09.30-10.00** **BOP Testing Automation Technologies – The Trifecta of Improving Process and Personal Safety While Reducing Rig Time:** Mark Anderson, Anderson & Spilman LLC

In 2013, Shell embarked on a project to improve and optimize BOP and other pressure-testing operations on drilling rigs and other types of units executing completion, workover and abandonment operations. A significant improvement in process and personal safety has been achieved, and a more than 50% reduction in BOP testing times was attained by applying existing automation technologies. This presentation will explain (1) the objectives of the project, (2) what technologies were utilized and how they were deployed, (3) performance improvement results achieved at date, and (4) how these technologies/results can be replicated by other. The scope of this automated BOP testing

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project touches on: pressure test planning, data collation, interpretation of pressure testing data, data exchange, modeling and data analysis, pumping equipment, valve position identification, valve actuation, leak detection and reporting.

10.00-10.30 [Seven Steps to Automated Directional Drilling](#): Bill Chmela, H&P Technologies

Automation of directional drilling has proven to reduce uncertainty and to deliver wells with lower drilling costs, lower lifting costs, improved hydrocarbon production potential and reduced risk of interference with other nearby wells. Seven steps were taken to improve directional drilling performance, with each step building upon the previous step to fully automated drilling. On the path towards fully autonomous directional drilling, tasks can be automated individually while other tasks continue to be performed by humans. Human expertise is kept “in the loop” by having experienced directional drillers in the field or overseeing operations from a remote center.

10.30-10.45 **Break**

10.45-11.15 [Empowering Operations to Reach New Levels of Productivity Through Automation](#): Matt Jackson, National Oilwell Varco

As the footprint of automation continues to grow, the need for support and infrastructure around the operation increases. While automation has shown increased consistency and efficiency, there are no magic bullets to getting an optimized process. Automation is a tool, but humans that understand how to optimize and effectively preplan are still required to ensure success. This presentation will discuss the organizational support required to gain full potential from a process automation delivery.

11.15-11.45 **The Roadmap to Fully Automated Drilling**: Bret Barre, MS Directional

As with self-driving cars, the shift to remove the driver out of the seat on the rig will not be easy. Mapping out what systems will be automated and what will remain in control of the human users is vital for a closed-loop system plan. Patterson-UTI is approaching drilling automation by developing applications that “plug and play” into the rig. This allows for automation to be tailored different levels, as customers only need vibration mitigation while others require fully automated geosteering. Patterson-UTI strategically initiated drilling automation by recent acquisitions of key services that enable automation. Each will have their own plug and play automated apps that integrate with a platform deployed on a super-spec rig. The platform will have a user-friendly interface customized with assistive features for remote access. Built-in sensors on the rig will enable the apps to deliver a semi- or fully- burdened automated drilling solution.

11.45-12.15 [Data Interoperability Workshop Knowledge Sharing](#): Darryl Fett, Total E&P Research & Technology USA LLC

In April 2019, over 50 industry experts met to discuss the issues and barriers delaying the implementation of interoperable systems used to share measurements and control data. This presentation summarizes the results of the workshop and recommendations of next best steps. The goal was to create a clear and compelling path forward to greatly improve interoperability needed for well construction operations. Participants examined the current state of interoperability and expressed their views of a desired future state. By examining the gaps that lie in between, a course of action could be directed at six key areas needing attention. Going forward, separate but coordinated working groups will be convened to propose solutions according to the task priorities determined in the workshop.

12.15 **Adjournment and lunch (sponsored by Patterson-UTI)**