IADC DEC Q1 2026 Tech Forum,
"Is Drilling Engineering Evolving? How is AI Enabling?"

Thursday, 26 March, 8:30am-12:30pm
*Venue: **Wild Well Control**, 2202 Oil Center Ct, Houston, Texas, 77073*

What emerging processes and technologies — such as Generative AI — are redefining well value? Drilling engineers are pivotal in well construction, influencing design, delivery and interventions through established workflows and decision-making frameworks. Increasing connectivity across stakeholders — from subsurface to abandonment — has introduced advanced tools that impact the entire well lifecycle.

The IADC Drilling Engineers Committee (DEC) will hold its Q1 Technology Forum on the morning of Thursday, 26 March. The forum will examine the development and application of next-generation drilling tools, workflows and processes, and how they integrate human expertise. Topics include well design, operational reporting, preventive maintenance, KPI-driven performance tracking and continuous improvement strategies. We welcome abstracts that explore whether Generative AI enhances efficiency by automating routine tasks, enabling employees to focus on higher-value work. Does AI truly transform data capture, job roles and operational reporting?

Special thanks to our event host Wild Well Control!

Agenda

08.30-08.45 Welcome – Matt Isbell, DEC Chairman, Hess; facility and safety briefing – Wild Well Control Technologies; introduction to event – Michael Edwards and Andrew Barry, DEC Board members

08.45-09.05 **"Transforming Operational Reporting: How Generative AI Automates DDR Data Capture,"** Fabio Concina, Kwantis View Presentation View Video Recording

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This presentation details a Generative AI solution for automating Daily Drilling Report (DDR) generation, addressing a persistent operational inefficiency in rig crew workflows.
The system architecture combines deterministic algorithms with Large Language Model capabilities. For time log generation, a segmentation algorithm isolates intervals of similar drilling activities by analyzing stand detection patterns and sensor readings. This algorithm offers configurable granularity, allowing operators to adjust activity resolution based on operational preferences. Activity descriptions are generated through customizable templates populated with sensor-derived parameters, ensuring consistency while capturing operation-specific details.

09.05-09.25 **"Applying Generative AI to Support Well Plan Creation: A Drilling Case Study,"** Hamza Raza, Nabors View Presentation View Video Recording

This project started because of how long it was taking drilling engineers to go through the entire process of reviewing well programs and making well plans from scratch every time. The goal was to build a drilling engineer brain from historical plans and wells that our current engineers had already created in order to take a massive load off their shoulders so they could

focus on other important tasks.

This approach was applied across 7 wells on 2 pads. What now takes approximately 2 minutes is the parsing of the well program and pulling the required information from it to build a well plan for the driller, compared to 1.5 to 2 hours when done manually. Accuracy was validated through side-by-side comparisons, engineer and operations reviews, and spot checks. In many cases, engineers found the output to be more accurate than manually created plans. Overall accuracy was approximately 95%.

09.25-09.45 **"The Drilling Engineer's Guide to AI Readiness: When to Invest, What to Avoid, and How to Prepare,"** Rob Blue, AI Driller View Presentation View Video Recording

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AI investment in the oil and gas sector was $5.3 billion in 2024, with projected growth to over $15 billion by 2029. While 95% of pilots fail to deliver measurable ROI, the technology shows genuine capability in specific applications. Analysis reveals four evaluation questions separating legitimate investments from technology theater: problem definition independent of AI terminology, data quality sufficient for manual decisions, quantifiable operational success metrics, and workflow integration without complete redesign. Successful implementations share problem-first development, foundational data architecture, and measurable outcomes. Failed implementations consistently skip data governance, lack clear metrics, and pursue technology-first strategies.

This provides drilling engineers with decision criteria for evaluating AI investments during market uncertainty. Data foundations protect capital while maintaining readiness for legitimate opportunities. Success requires starting with operational problems rather than AI solutions and establishing data quality before deployment.

IADC code assignment employs a Retrieval-Augmented Generation (RAG) pipeline leveraging historical operational data. The model retrieves relevant examples of user-assigned codes from past operations, enabling the LLM to infer appropriate codes and subcodes while providing transparent justification for each selection—supporting both automation and auditability. Deployed across four rigs processing 150+ rig-days of data, the solution achieved over 50% reduction in report preparation time while maintaining IADC compliance.

09.45-09.55 **Coffee break**

09.55-10.15 **"Artificial Intelligence-Enabled Drilling Time and Risk Estimation: Moving Beyond Spreadsheet Workflows,"** Andres Nunez Davila, Freddy Gori, Jorge Erives, Jose Telles, Jessica Pacca, Gerardo Leon, Oscar Azuara, Jorge Gallardo, Francisco Alvarez, SLB View Video Recording

Accurate and timely evaluation of project feasibility—including drilling time estimation and associated risk assessment—is essential for cost evaluation and overall project viability. Operational data for each well are recorded in Daily Drilling Reports (DDRs), which have historically been generated in non-standardized formats such as PDFs, spreadsheets, and word-

processing files, while legacy wells were often documented manually. Consequently, several long-standing challenges persist in conventional workflows, including the analysis of unstructured DDRs, manual evaluation of offset wells, prediction of operational sequences, calculation of productive time statistics, and human-driven risk assessments.

This presentation introduces the implementation of modern digital solutions for offset well data acquisition, drilling time estimation, and risk analysis evolving conventional drilling engineering tasks. By integrating data standardization, automation, and advanced analytics within a unified digital framework, these solutions significantly enhance data quality, reduce processing time, and enable robust, defensible risk evaluations.

10.15-10.35 **"Using Large Language Models (LLMs) in modern well engineering, from data input to workflow orchestration,"** Gaute Haansnar, Oliasoft View Presentation View Video Recording

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Engineers spend a disproportionate amount of time preparing data rather than performing engineering analysis. In some cases, engineers devote up to 30-50% of their time to sourcing, formatting, cleansing; and finally, transferring data between systems. Integrations between systems, supported by generative AI, allow engineers to introduce optimized methods to enhanced productivity. Specifically, imbedded LLMs deployed in specific systems enable continuous analysis and recalculations without data wrangling or manipulation.

Cloud-native software, made with modern architecture, is foundational to unlock AI workflows. When every calculation engine and simulator is built with programmatic interfaces to enable machine-to-machine communication, automatic data updates trigger recalculations throughout the computation chain. This infrastructure enables AI orchestrated engineering processes and empowers engineers to focus on analysis.

This presentation covers practical examples of how this is executed in a modern well engineering workflow and introduces measurable outcomes from deploying AI in well engineering environments.

10.35-10.55 **"Hole Cleaning and Borehole Stability Management with Integrated Real-Time Measurements and Modeling,"** Abraham Montes, The University of Texas at Austin

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Existing methods for evaluating hole cleaning and borehole stability during drilling are limited. This presentation will discuss a system that integrates advanced modeling with a state-of-the-art sensor to diagnose potential borehole instability and insufficient hole cleaning. The proposed system encompasses three main components. The first is a laser-based sensor that collects 2D and 3D data of the cuttings stream in real time. The second component is a digital tool that uses state-of-the-art artificial intelligence techniques to transform the collected data into information relevant for borehole condition evaluation, such as recovered cuttings volume and size distribution. The third component is a set of physics-based models—for cuttings transport and rock mechanical behavior—that provide a real-time baseline to assess whether there is an excess or deficiency of cuttings recovered at the surface and/or indications of rock failure, thereby supporting the diagnosis of poor hole cleaning or borehole instability.

This work presents the first automatic, fully integrated system capable of providing a comprehensive real-time evaluation of hole cleaning sufficiency. It combines an accurate and direct measurement of cuttings volume with a reliable estimate of the expected volume, thereby supporting stuck pipe prevention. More importantly, the system represents a key advancement toward fully automated hole cleaning and borehole stability management, as well as autonomous drilling.

10.55-11.10 **Short break** (lunch boxes can be picked up during this time)

11.10-11.30 **"SMEs Make the Model: Why AI Succeeds at Large Operators but Struggles at Smaller Ones,"**
John de Wardt, DE WARDT AND COMPANY, and Peter Kowalchuk, Taurex Drill Bits
View Presentation View Video Recording

Major operators and major service companies have strong drilling domain knowledge supported by education and in-house subject matter experts (SMEs). Globally, small regional operators have weak drilling domain knowledge, preferring to purchase knowledge rather than train internal resources.

Over half of global oil production comes from operators producing under 100,000 barrels per day, many closer to 5,000. Half of all wells drilled in 2025 were in Russia and China, highlighting stark differences in scale, technical depth, and operational maturity. These disparities directly impact AI adoption. Technologies like Generative AI depend on deep domain expertise and high-quality data, which are unevenly distributed. Large operators benefit from strong SME support and mature data foundations, while smaller operators often lack both. There is no universal AI playbook; successful adoption must align with each operator's capabilities.

AI has been applied successfully, so why is it that crash and burn with AI is also a reality?
AI has produced real value, but high-profile failures persist for the same structural reasons. Large organizations can rely on sustained capital, extensive operational data, and SMEs who can interpret and operationalize AI outputs. Smaller operators may acquire tools and possess historical data, but they often lack the one asset that cannot be purchased: domain expertise. Without it, data cannot be properly contextualized, labeled, or trusted. This presentation examines that gap and outlines practical, right-sized AI paths forward across the operator landscape.

11.30-12.30 **Interactive panel session**

- Steve Bowman, Chevron
- Josh Etkins, Shell
- Todd Fox, H&P
- Leianne Sanclemente, Superior Energy Services

12.30 Adjournment