



# Greenfields: Exploratory Drilling with ECO

## Challenge

- Timely delivered information
- Effective remote management.
- Drilling Hazards Prevention
- Improving drilling efficiency

## Solution

- Automated analysis, real-time visualization of key indicators
- Real-time notification of all well construction process participants when non-production processes occur.
- Live digital twin, predictive and prescriptive analytics
- Instrumentation data QA QC in real-time.
- Reliable and secure data transfer and storage at a remote support center
- Retrospective well data analysis tools
- Drilling engineering and well planning tools

## Results

- ✓ Reduction of borehole complications and disasters
- ✓ Increase in ROP by 1.7 times
- ✓ Reduction of mud losses associated with absorption by 57%

## CASE OVERVIEW

An E&P company drills wildcat wells in poorly explored and hard to access locations in Eastern Siberia. Exploration campaign success has been compromised by substantially greater expenses than foreseen. These high uncertainties were associated with a lack of reliable and effective tools for remote operations control and contractor management.

As a solution for the challenges facing the client deployed a digital ECO system tool to improve and efficiently manage well construction operations and related expenses: to timely estimate costs for technological operations, drilling equipment, and drilling fluids. The main requirements for the deployed digital platform were:

- Predictive and prescriptive analytics tools that will work in real-time and in conditions of limited geological data.
- Be able to ensure that information is delivered timely and data is transparent for all well construction involved contractors considering the conditions of an unstable Internet connection.
- Provide secure remote access and safe data repository, data center capable of leveraging additional insights via pre-existing well drilling data retrospective analysis.

## Data quality and a systematic approach.

The cloud component of the platform was deployed on the customer's servers, in an environment that is secure and isolated from physical and external access. The cloud-based functionality of the platform allowed the Client to carry out a retrospective analysis and engineering and design assessment of the risks associated with the upcoming drilling of appraisal wells. The Client's engineering team integrated all available licensed area data into the platform and performed a retrospective analysis of previously drilled wells.

These pre-engineering efforts made it possible to identify previously hidden technological and operational misses, determine the root causes of experienced downhole complications, and separate the geology and geomechanics hazards from operational flaws. The client's personnel were trained, and a set of tunings and digital platform reconfigurations has been performed to fit the Client specific needs. The adaptation of operational and reporting functionality meeting clients and local regulations was implemented. At a rig up and before the spud of a next well, the ECO gateway was configured to aggregate data from all sensors and instrumentation of services involved: Drilling contractor, mud loggers, wireline, and cementing units. Field personnel was instructed to work in ECO.

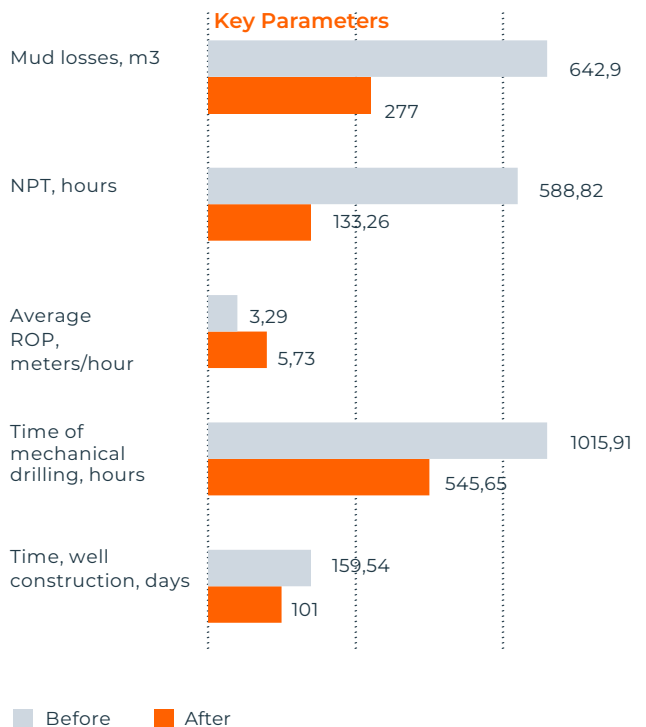
## Process transparency and prompt response

The result of due diligence preparations established process transparency and live involvement of all contractors into the digital ECO system made it possible to significantly improve operational efficiency and feet per day ratio.

Predictive analytics, based on a live, dynamic, multi-disciplinary physics-based modeling, allowed to identify and avoid in its early stages several downhole complications: catastrophic mud losses, fractures while drilling, and made it possible to maintain wellbore intact - preserve an open hole quality. Real-time analysis of drilling dysfunctions, and optimization of technological parameters, made it possible to drill wells with doubled penetration rate in the comparison with jobs before the ECO deployment. Automated morning reports, real-time KPIs analytics, and drilling parameters trend analysis allowed to minimize non-production time, reducing the time of off-bottom operation by 80%.

The result of the total time for well construction has improved by 35% compared to the wells completed prior ECO deployment. Drilling data, MWD, LWD, wireline, and cementing logging data, coring and cuttings analysis are available to the Client available in digital format in a single digital space enabling further drilling planning, play analysis, and production.

## Key Statistic Parameters



# 80%

## NPT time reduced

# 2 times

## faster drilling time

# 60 days

## Earlier completed well

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