SPE RUSSIAN PETROLEUM TECHNOLOGY CONFERENCE AND EXHIBITION

24–26 October 2016
WTC, Moscow, Russia

SPE-181928-MS.
Well Drilling Process Optimization in the Verkhnechonskoye Oil and Gas Condensate Field

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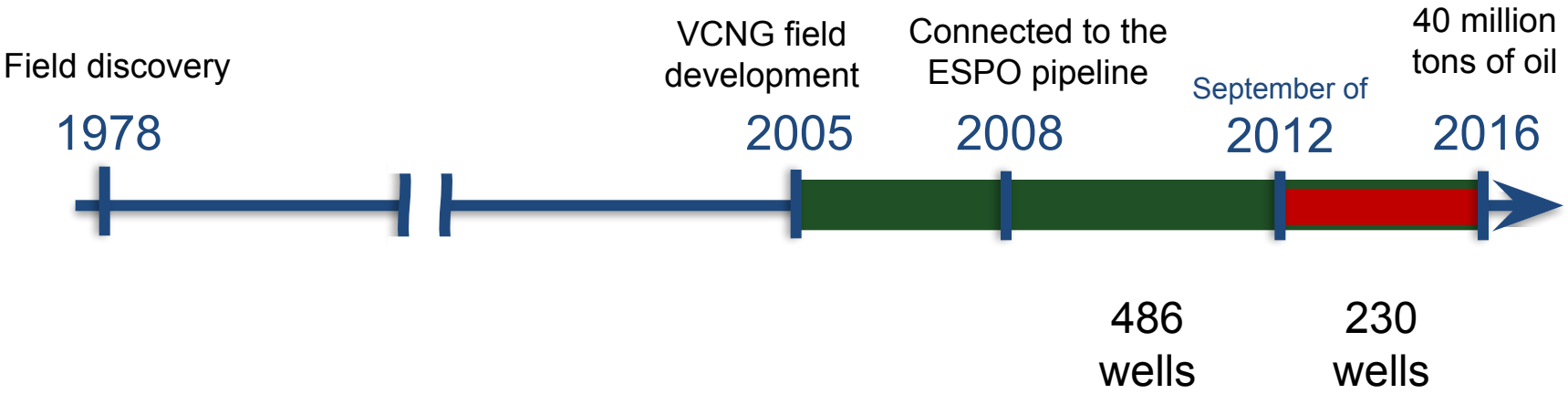
Verkhnechonskoye Oil and Gas Condensate Field

VCOGCF is located in the north of the Irkutsk Region, in the Chone river's head

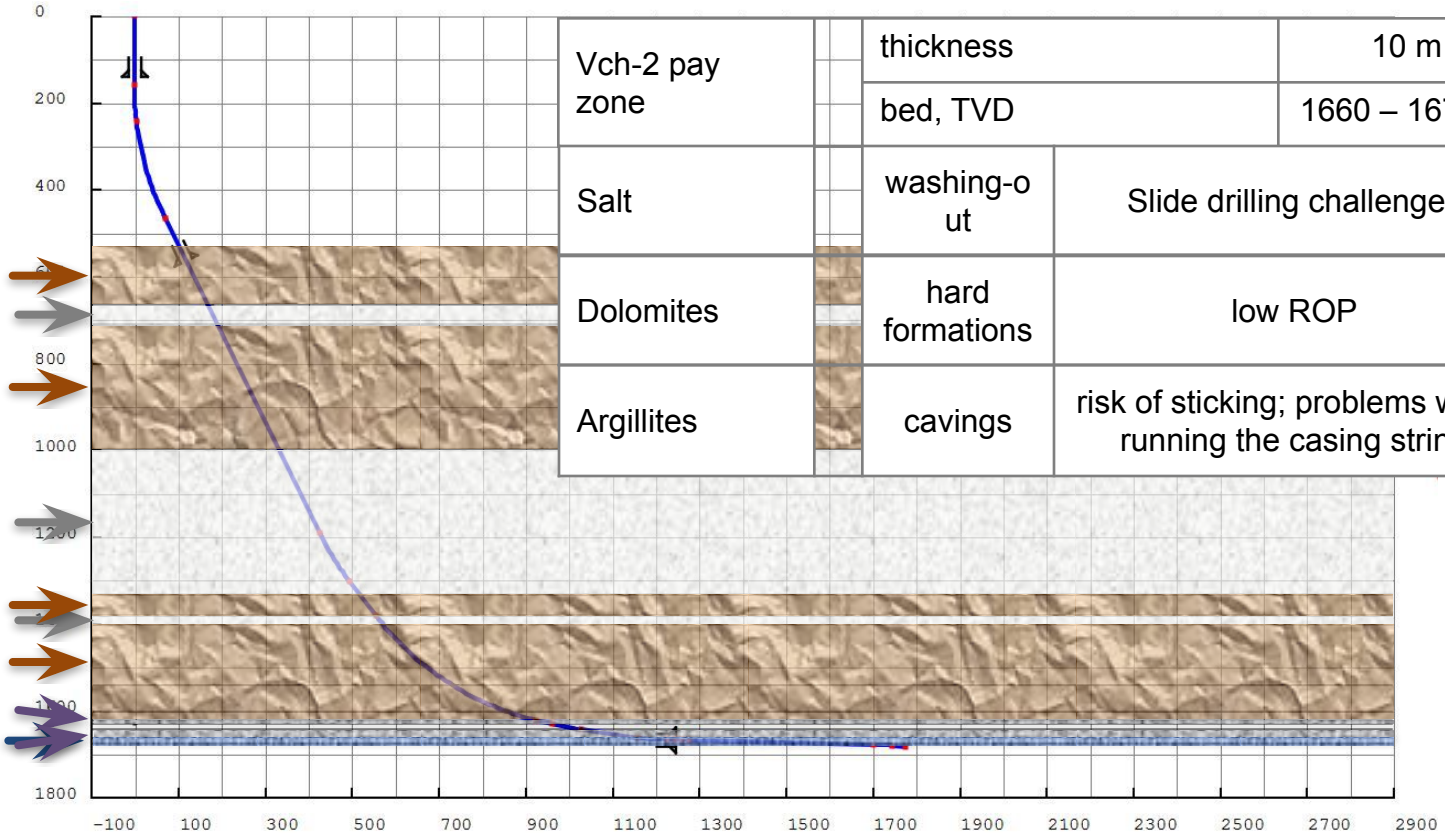
It is one of the largest in Eastern Siberia

- Oil reserves total 200 million tons
- Gas reserves total 95.5 billion m^3

Verkhnechonskoye Oil and Gas Condensate Field

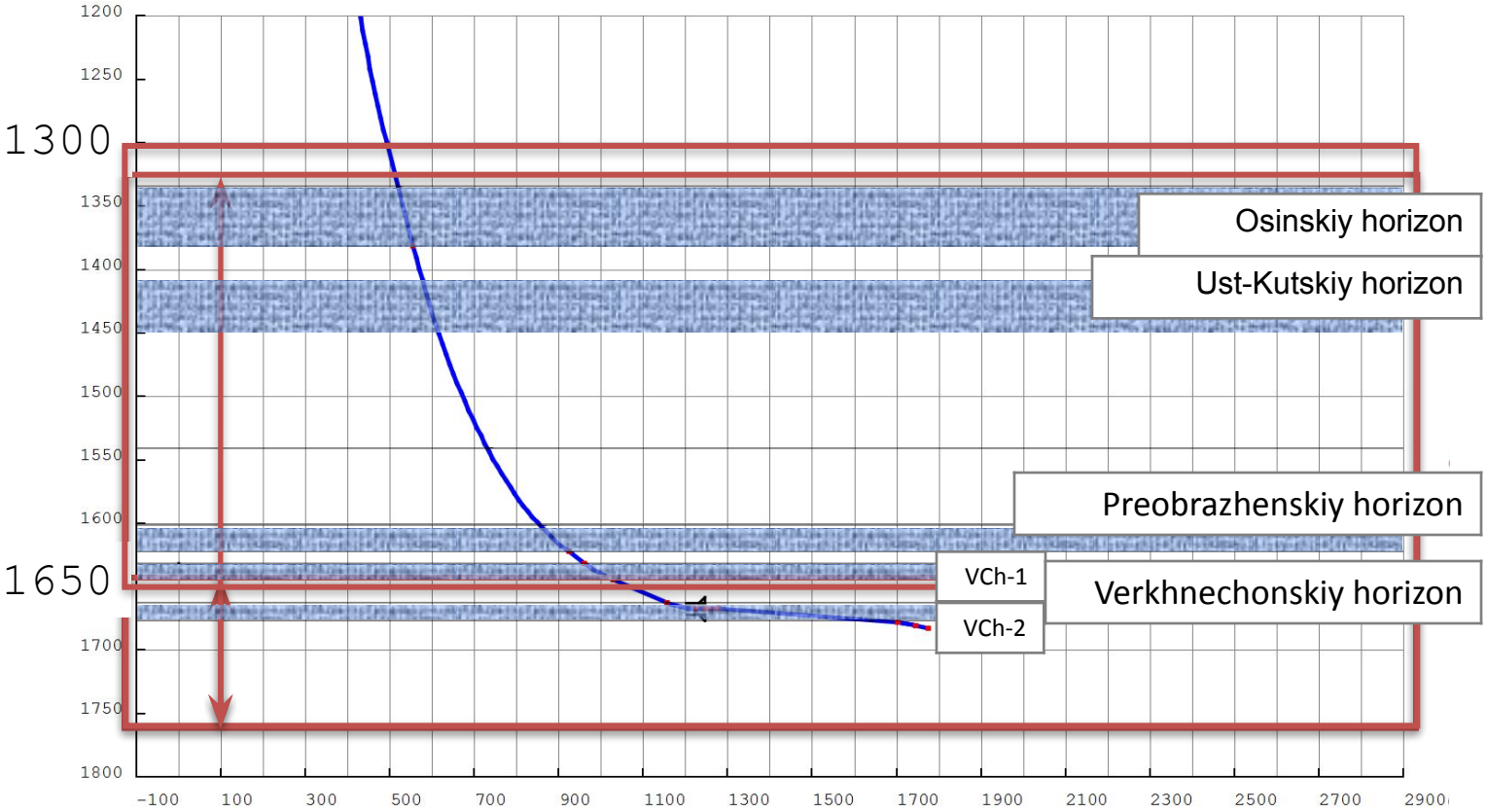


VCOGCF Geological Structure

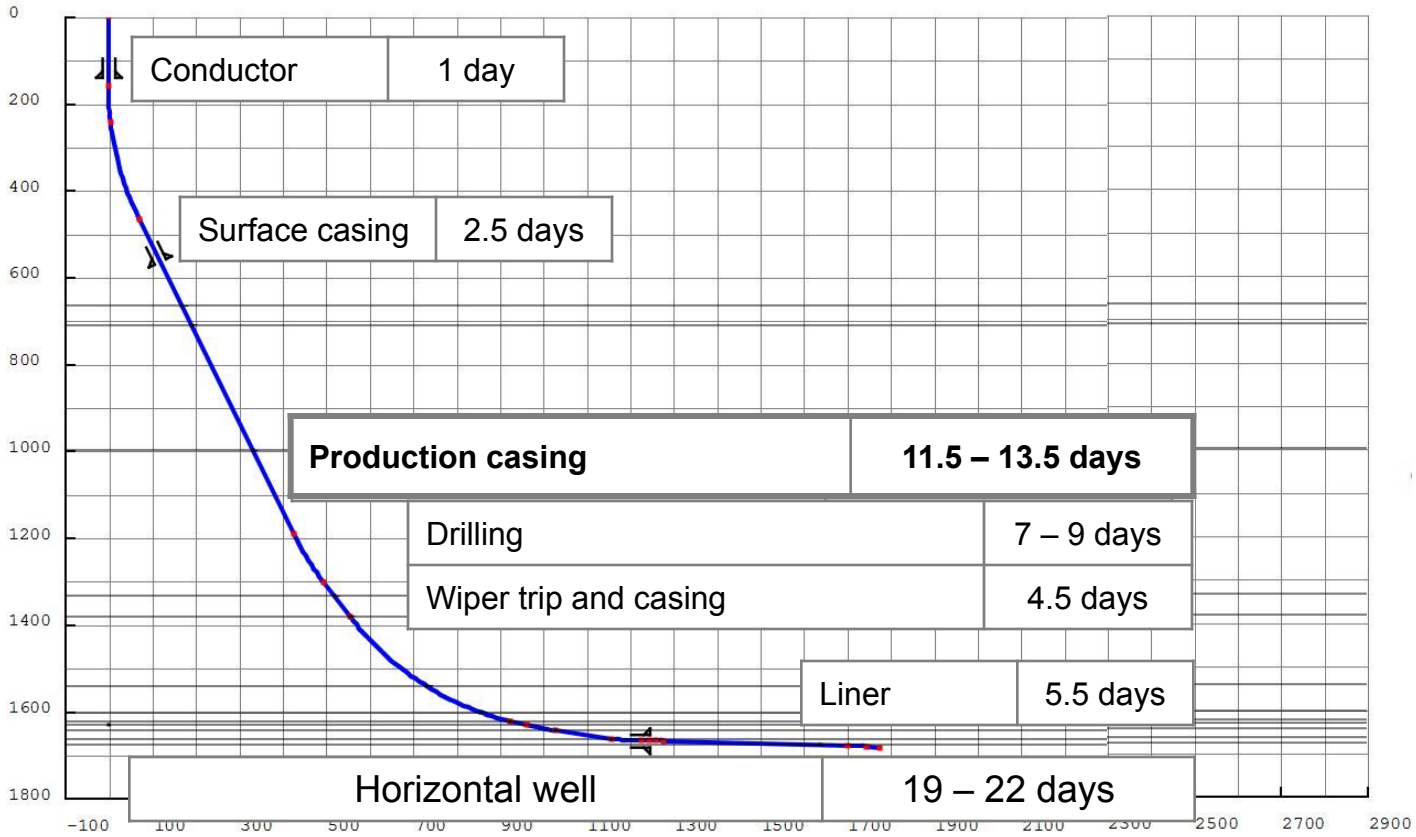


Vch-2 pay zone	thickness	10 m
	bed, TVD	1660 – 1670 m
Salt	washing-out	Slide drilling challenges
Dolomites	hard formations	low ROP
Argillites	cavings	risk of sticking; problems when running the casing string

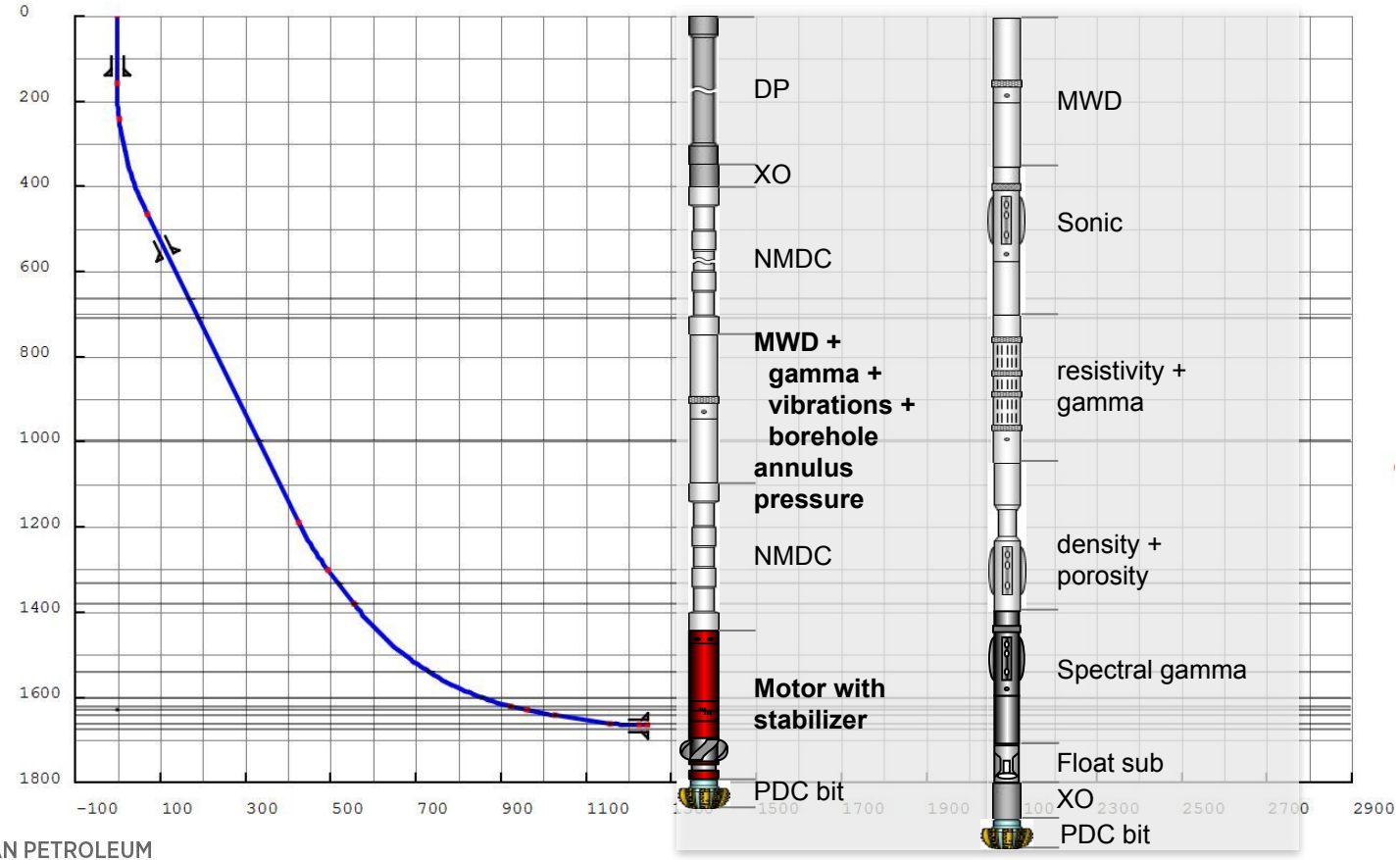
Pay Formations in VCOGCF



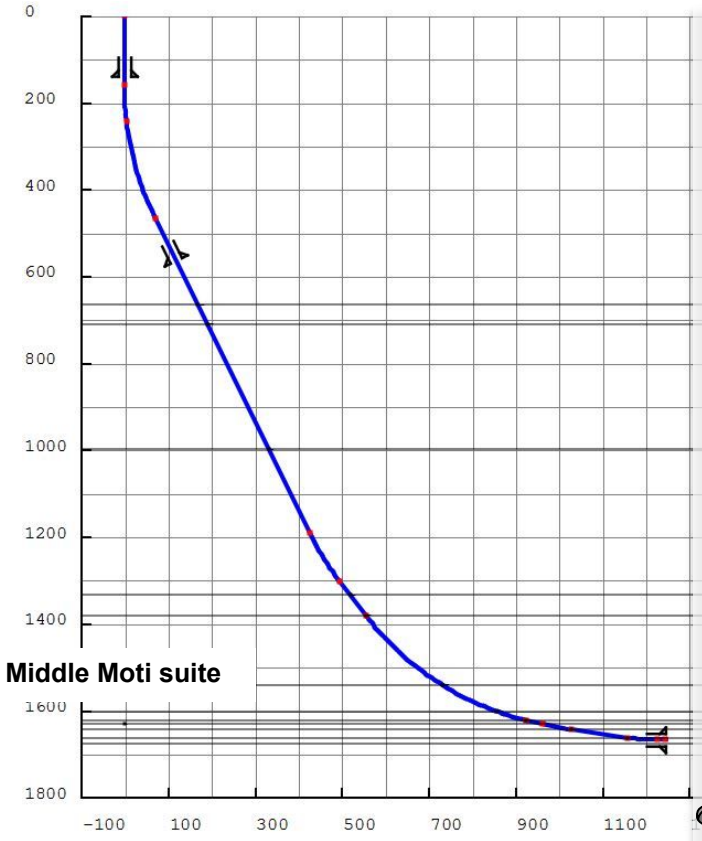
Well Drilling Process Optimization in VCOGCF

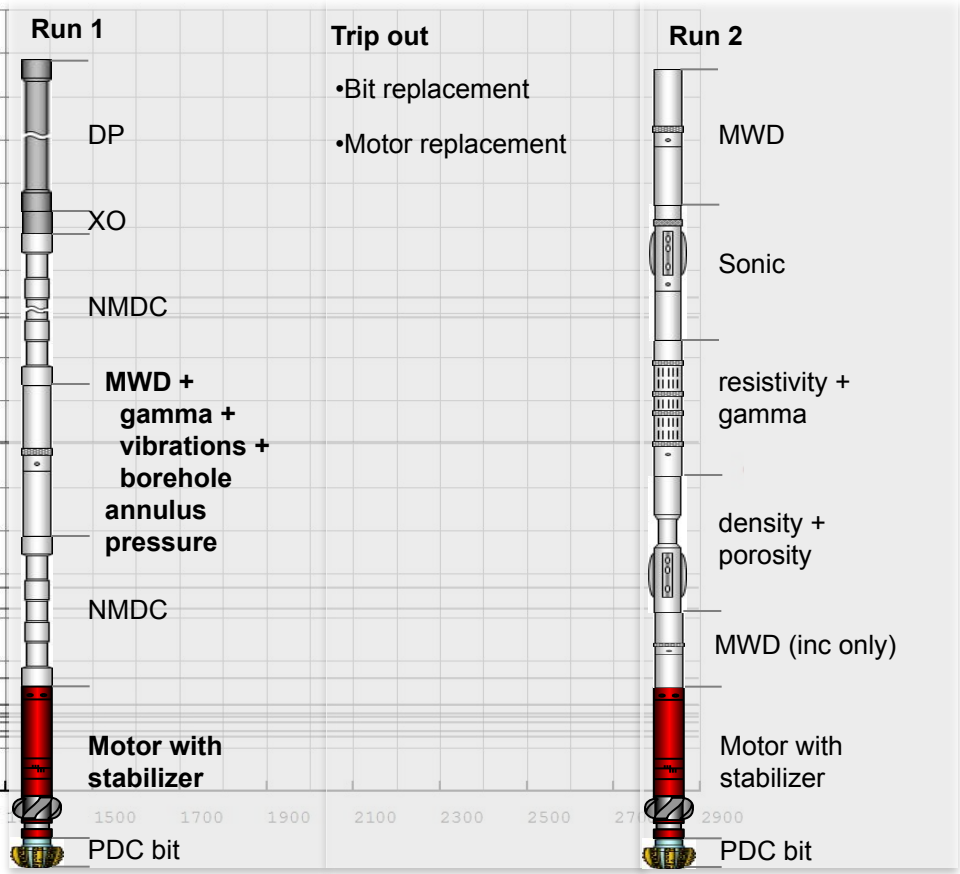


Production Casing Section Drilling



Experiment #1. Drilling over 2 Runs





Production Casing Section Drilling over 1 run

Water based mud

↓

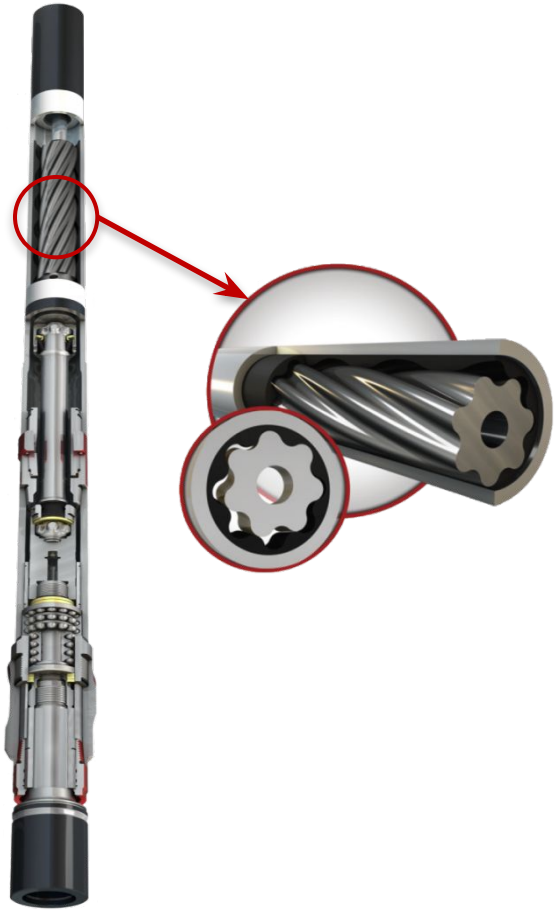
Oil based mud

↓

Stator elastomer wears out much faster

↓

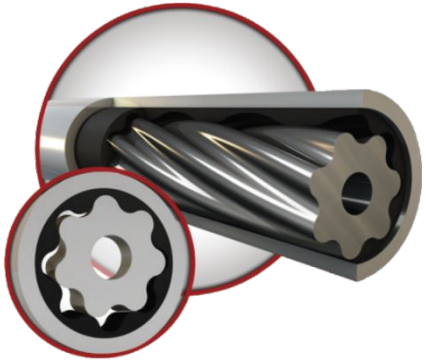
Motor with an oil-resistant elastomer is required



Motor with an Oil-Resistant Elastomer

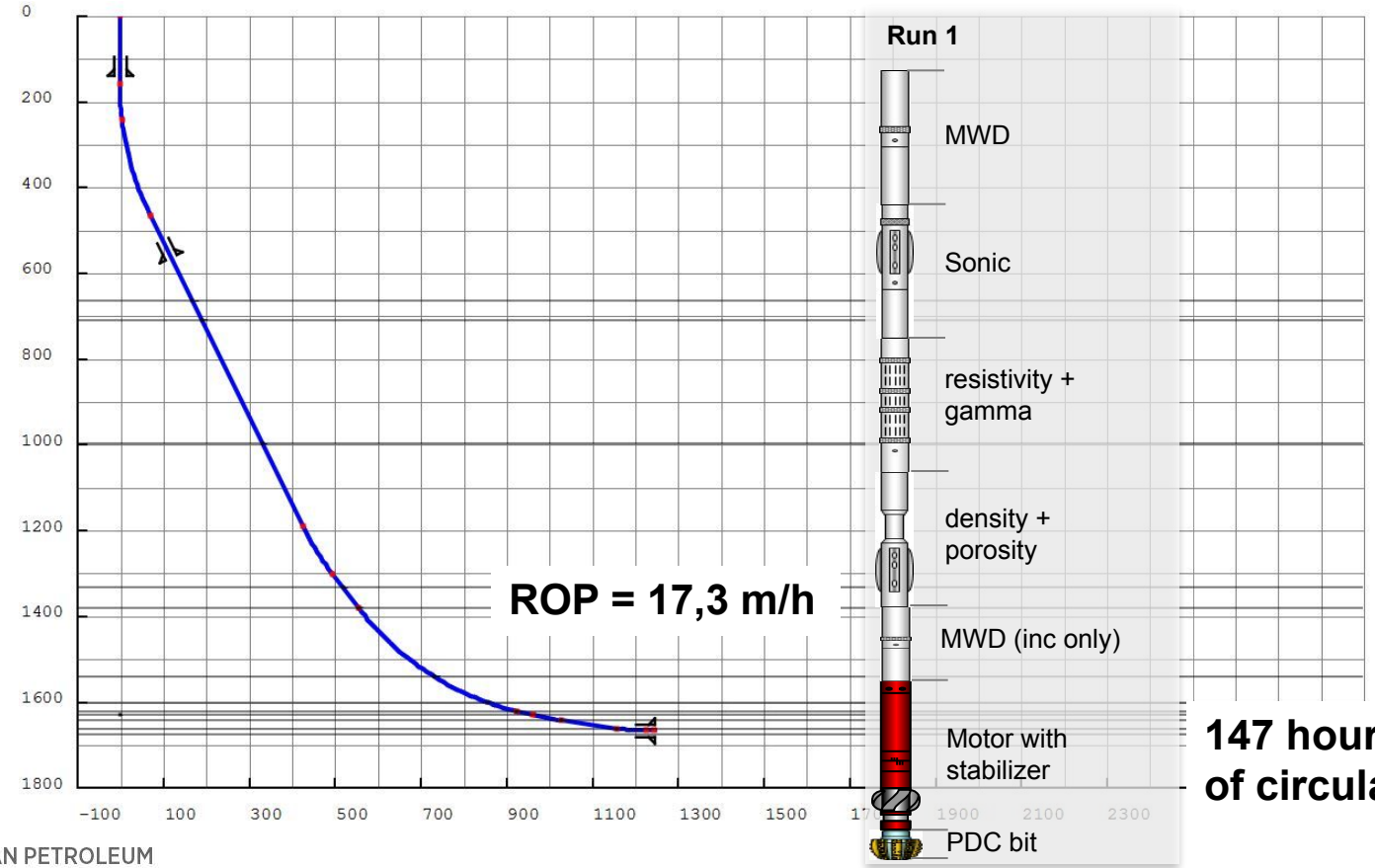
Drilling mud samples

Motor manufacturing



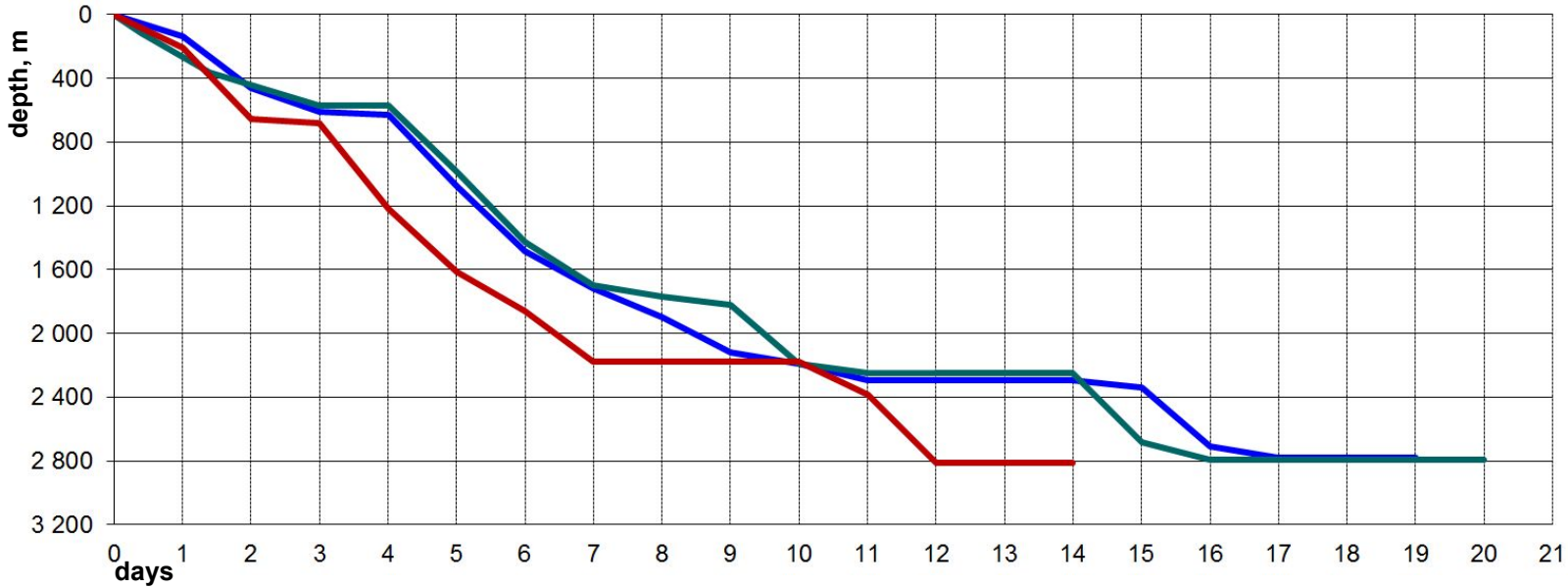
NBR-HR-37 elastomer

Experiment #2. Drilling over 1 Run



147 hours of circulation

Time for Drilling Production Casing Section

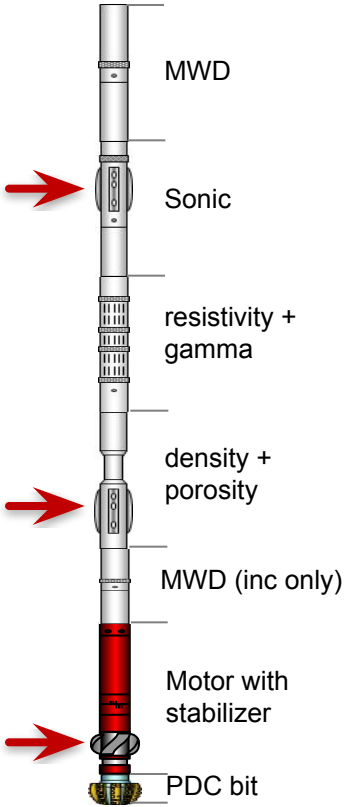


Conventional drilling of production casing section

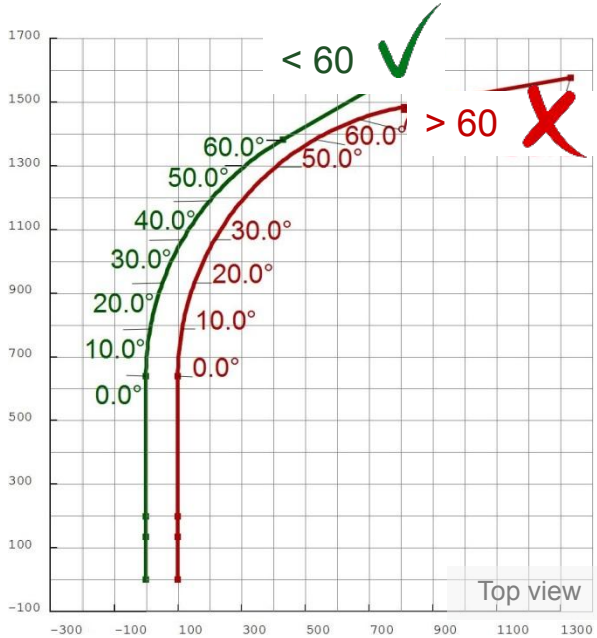
Drilling over 2 runs — 12-30 h

Drilling over 1 run — ≈ 45 hours

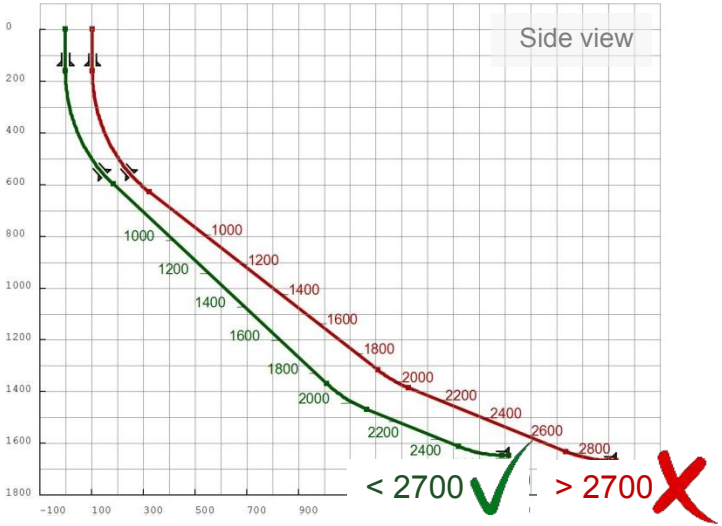
Restrictions



Azimuth change is to be less than 60°



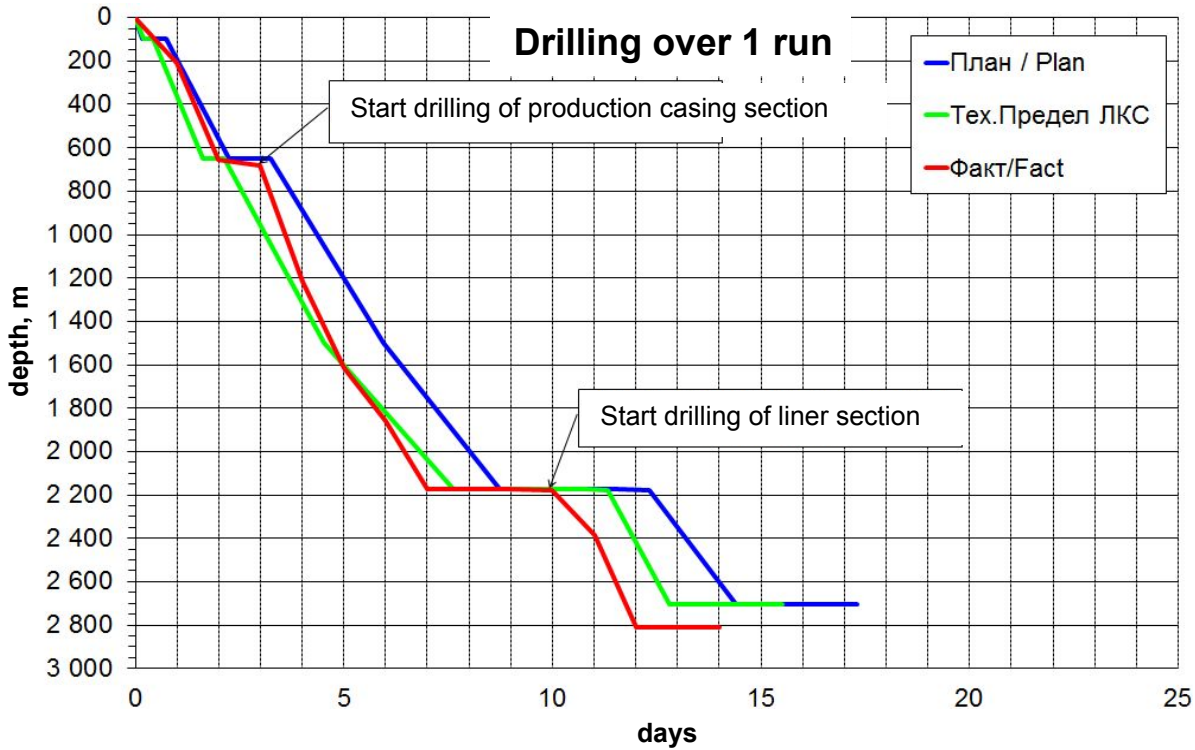
Production casing setting depth is to be less than 2700 m



The Results of Production Casing Section Drilling Optimization

- ✔ LWD suite is included in BHA
- ✔ Production casing section is drilled per one run
- ✔ The bit design is optimized
- ✔ An optimal size of the motor stabilizer is selected
- ✔ Water based mud is replaced by oil based mud
- ✔ Oil resistant elastomer is selected based on drilling fluid sampling
- ✔ MWD pulser is adjusted based on defined borehole conditions
  - Data transmission speed increase
  - ROP increase
- ✔ An individual approach to each well

Record well



Production casing interval is drilled and cased for **7 days**

Total well construction time **14 days**

The Results of Production Casing Section Drilling Optimization

✔ 8 wells drilled with Drilling optimization

✔ 250 hrs of total well-construction time saving

✔ 15 000 000 RUB – Value to Client

Acknowledgements / Thank You / Questions

The authors express thanks to the management groups of PAO “VCNG” (PAO “NK Rosneft”) and Weatherford companies for the permission to publish and submit the results of this paper.
We also express thanks to the drilling crew and the service specialists who were involved in the well drilling and were gathering the field data for analysis.