Introduction to Drilling

SPE LONDON

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Content



- History & Well Types
- Phases of a Well
- Rig Types
- Costs & Values

It's ALL about Drilling!



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Drilling Through Time

- 1000 BC salt drilling China, 800 ft by 300 AD
- 1264 mining oil seeps Baku
- 1594 oil wells hand dug (115 ft)
- 1859 1st oil well in USA (70 ft)
- 1989 vertical well: 40,230 ft (Kola, Russia)
- 2018 directional well : 49,250 ft (Sakhalin, Russia)







Well Types



- Exploration
 - Anything there? (success rate 1:5)
- Appraisal
 - How much is there?
- Development (Hydrocarbon / Geothermal / CCS)
 - Production : makes the money
 - Injection : keeps it coming



Vertical & Directional Wells





















Extended Reach Drilling (ERD)

Access distant targets



Drainage Radius



ERD Record: 41,338ft (14.2 km)



Drilling Rigs - Land









Drilling Rigs - Offshore







Drilling Rigs - Offshore









Well Time & Costs

- Drilling times
 - 5 to 500 days
 - Typical 20 50 days
- Drilling costs
 - US\$100k US\$1Mn per day
 - Well: US\$2Mn to US\$100's Mn
 - Typical onshore US\$5Mn / offshore US\$30Mn
 - ≈ 80% of costs are time dependent





Value of Drilling Quickly!



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Summary



- Wells
- Costs
- Phases of a Well
- Rigs

All Prospects look good on paper – need to drill



If we always do what we've always done, we'll only get what we've always had!