MERCURY

Drilling Optimization

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Introduction:

Drilling time is costly, and non-productive drilling time is the costliest of them all, and reduction of this time, through the adequate definition and monitoring of KPIs, data management, quantifying uncertainty in the subsurface, risk assessment, and use of modern drilling technologies and trends.

The oil and gas industry is at the point where the rise of fracking and enhanced oil recovery has stabilized the price at the lower levels, no matter that several large oil producers are practically squeezed out of business, which requires good engineers to reduce the non-productive drilling time to be able to reduce the production cost.

In the Big Data era, the benchmarking, identification, application, and implementation of drilling optimization techniques are a must to be used by good engineers.

Targeted Groups:

This course is designed for all professionals working in the field of engineering, oil and gas exploration, geology, and reservoir modeling.

It is also beneficial for other people involved in upstream oil production as it shows the interdependence of the data between the departments:

- Reservoir Engineers
- Petroleum Engineers
- Risk Managers
- Drilling Managers
- Field Service and Related Operations
- Tool Pushers
- Drillers

Course Objectives:

At the end of this course the participants will be able to:

- Recognize the influence of drill string mechanics
- Understand how to avoid drilling problems
- Appreciate the environmental effects of drilling activities
- Implement techniques to control non-productive time
- Effectively identify and monitor key performance Indicators KPI
- Implement real-time management of well construction and optimization

Targeted Competencies:

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- Reservoir modeling and drilling operations, as well as well design,
- Basic good engineering calculations
- How to complement conventional petroleum engineering analysis with the Big Data Analytics
- Non-conventional drilling methods
- Advanced drilling technologies

Course Content:

Unit 1: Drilling and Well Engineering Calculations:

- Drill String Mechanics
- Well Design Concepts
- Drilling Fluid Calculations
- Directional Drilling
- Measurement while Drilling Systems MWD
- Controllable and Non-controllable Non-Production Time NPT

Unit 2: Drilling Optimization:

- Introduction to Drilling Optimization
- Petroleum Rock Mechanics
- Defining of KPIs
- Use of Common Industry KPIs
- Wellbore Stability Analysis
- Rock Strength and Rock Failure

Unit 3: Quantitative Risk Assessment:

- Risk Management Process
- Cost-time Analysis
- Common Drilling Problems
- Measurement and Evaluation of Risk
- Limit State Function and Probability Failure Function

Unit 4: Well Engineering Design and Construction Optimization:

- Optimization of a Process and Its Elements
- Drilling Plan
- Rate of Penetration Monitoring
- Other Goals of Well Drilling and Construction
- Technical Limits and Quantum Change in Limits

Unit 5: Drilling Optimization-tools and Technologies:

- Advanced Drilling Techniques
- New Developments in Technology
- Use of Software
- Well Site Parameters and Drill String Inventory Optimization
- Kill Sheets Use