

DRILLING FLUIDS SCHOOL

DRL011

COURSE OVERVIEW

This drilling fluids school course prepares the trainee for an oil field position managing the drilling fluids on drilling rigs searching for oil or gas anywhere in the world.

Drilling fluids engineers; commonly known as 'mud men, mud engineers, drilling fluids representatives, or drilling fluids technicians, are an important part of the oil field team. Poor drilling fluids management can cost an operator hundreds of thousands of dollars dealing with unplanned events such as stuck pipe, slow rates of penetration (ROP), poor logging and cementing operations, and in some situations, even well blow outs.

Drilling fluids engineers develop expertise over time and know how to keep the mud functioning properly by using standardized testing procedures as recommended by the American Petroleum Institute (API).

The testing data provides a detailed overview of the drilling mud's properties, i.e. temperature, viscosity, pH, etc. The mud man can then begin chemical or mechanical treatments to raise or lower the mud's properties, bringing them in line with parameters as set forth in the mud program.

COURSE OBJECTIVES

Participants of this course will be able to:

- Be familiar with the mud types, tests, and properties
- Calculate volumes and economics of mud
- Select mud additives for the appropriate properties
- Combat drilling problems related to mud
- Optimize solids contents in drilling mud
- Perform tests to justify drilling problems and contaminants
- Optimize hydraulics for drilling operations
- Work with mud conditioning systems and optimize each one
- Troubleshoot drilling problems with mud additives
- Manage wastes generated from drilling operations
- Perform exercises related to the objectives

WHO SHOULD ATTEND

Junior drilling engineers, mud engineers, geologist, mud loggers, operation engineers,

COURSE DURATION

5 Working Days

COURSE OUTLINES

Day 1

1. **Pre course evaluation**
2. **Drilling Fluid Functions and properties**
 - Drilling fluid functions
 - Drilling Fluid properties
3. **Waste management and treatment**
 - Mud wastes
 - Waste management strategy
 - 3R strategy in waste management
4. **Mud tests**
 - Physical property tests
 - Chemical properties test
 - Exercise

Day 2

5. **Lost prevention**
 - Mud lost at surface
 - Mud lost downhole
 - Prevention techniques
 - LCM
6. **IFE (Integrated Fluid Engineer) completion and workover fluids**
 - Fluid types
 - Fluid selection
 - Fluid maintenance
7. **Solids control equipment**
 - Shale shaker
 - Hydrocyclones
 - Mud cleaner
 - Centrifuge
 - Troubleshooting solids control equipment
 - Exercise

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Day 3

8. Project planning

- Mud types
- Mud additives
- Mud selection

9. Land and offshore wells

- Difference between land and offshore well
- Mud preparation and maintenance

10. Fixed or variable flow rate analysis

- Mud pumps
- Flow rate calculation
- Recommended flow rate for good hole cleaning
- Change in flow rate
- Exercise

Day 4

11. Bit hydraulics optimization

- Hydraulic horse power calculation
- Optimization techniques
- MHHP technique
- IF technique

12. Surge and swab

- Origin of surge and swab
- Problems associated with surge and swab
- Recommendation to avoid surge and swab

13. Bingham plastic, power law and HB models

- Meaning of rheology
- Flow pattern
- Bingham plastic flow
- Power law flow
- Heschel Bulkely HB flow
- Calculation of flow parameters
- Exercise

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Day 5

14. Cutting concentration

- Solids in mud
- Solids calculation
- Cuttings concentrations

15. Critical flow rate calculation

- Flow rate calculation
- Critical flow rate calculation
- Pressure drop calculations

16. Mud additives and troubleshooting mud problems

- Types of additives
- Problems associated with mud
- Troubleshooting mud problems

17. Post course evaluation.

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