

Introduction to Drilling Fluids Technology



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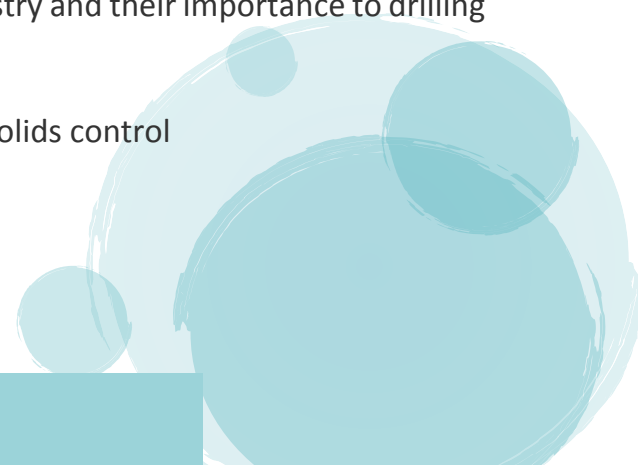
Introduction:

The demands placed upon drilling fluids have increased dramatically over the last two or three decades. The drivers include reducing environmental impact, maximizing well productivity, accessing high temperature reservoirs, extended reach drilling, and deep water drilling.

Course participants will learn about the fluid systems and additives developed to meet these demands, as well as basic introductions to drilling fluids, clay chemistry, and polymer chemistry. The molecular structure and functionality of various fluid additives is presented to gain an insight into how things work and how fluid formulations are designed to meet specific well parameters.

Objectives

By the end of this BTS training course, participants will be able to:

- Have an understanding of the composition and properties of drilling and completion fluid systems and additives
 - Gain insights into how things work, and where they do not work
 - Have grounding in clay chemistry and polymer chemistry and their importance to drilling fluid design
 - Have an appreciation of the importance of efficient solids control
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- Acquire a background in the mechanisms of formation damage, reservoir fluid design to maximize productivity, completion fluid systems, and the field applications of completion brines.

Who should attend?


Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Work over Engineers, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production Engineers & technologists, Well site Engineers, Lifting Personnel, Maintenance Engineers, Foremen, Industry Personnel

Course Outline:

Basic Geology

- Porosity & Permeability
- Reservoir properties
- Hydrocarbon reservoirs and origins

Pressure Detection

- Development & causes of Abnormal Pressure
 - Overview evaluation of Abnormal Pressure
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Fracture Gradient

- Introduction –What is a Fracture Gradient
- Fracture Gradients –Importance?

Introduction to Drilling Fluids

- History of Drilling Fluids (Mud)
- When / How 'MUD' came to be used in the Oil & Gas
- Industry, Functions of a drilling mud

Rheology & Hydraulics

- Physical properties of drilling 'muds', Bit hydraulics

Basic Chemistry & Drilling Fluids Chemistry

- Concepts & terminology
- Chemical types and reactions
- Water chemistry, pH and Alkalinity
- Control

Clay Chemistry

- Fundamental Clay Structure
- Interaction with water
- Control

- Use
- Interaction
- Loss Circulation
- Why, Materials
- Different WBM
- Classification
- Contaminates
- Salt, Solids
- Oils
- Acid gases
- Leading to property changes
- Common Calculations used in WBM

Polymers:

- Types
- Uses

Water Base Drilling Fluid (WBM):

- Components
- Miscellaneous Specialty Functions
- Clays

Oil Base Drilling Fluids or Non-Aqueous Fluids (OBM)

- Types, Inverts, Mineral, Common Calculations used in Oil Base Muds
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- Stuck Pipe
- Differential
- Key Seating
- Under gauged
- Kick
- Blowout
- Corrosion

Environmental Concerns.

Completion & Work over Fluids.

Solids Control

- During drilling a well, Analysis, Equipment

Common Drilling Problems and Mud Remedies Used Today

- Formation Damage
- Causes
- Mechanisms
- Loss Circulation