

WELLBORE STABILITY & HOLE CLEANING

DRL025

COURSE OVERVIEW

This course will cover a practical overview of the Wellbore instability, stuck pipe mechanics, and detail emphasis in hole cleaning conditions, practices, procedures and monitoring. The course focuses on correct responses by individuals and teams, early warning signs, and minimizing the impact to drilling operations. Through world-class presentations, practical discussion, and the best reference and instructional materials available, delegates hone their knowledge of basic drilling technology and how it relates to avoiding NPT.

COURSE OBJECTIVES

Upon successful completion of this course, participant will be able to:

- Identify mechanisms and risk factors that lead to stuck pipe incidents (Wellbore Instability, Hole Cleaning, Differential Sticking, and Wellbore Geometry)
- Assess mechanics of wellbore stresses and the impact on wellbore stability
- Analyze trends to identify early warning signs of developing wellbore problems
- Implement effective drilling and tripping practices
- Make cost-effective choices in planning fishing operations

WHO SHOULD ATTEND

Drilling Engineer, Drilling Supervisor, Risk Managers, and Drilling Managers.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Rock Mechanics

- Stress –strain diagrams
- Geo-mechanics and Structural Geology
- Mechanics and Causes of Folding
- Mechanics and Causes of Faulting and Fractures
- Factors Affecting the Bore Hole Stability
- Induced Factors Affecting Bore Hole Stability
- Drilling Fluid Effect on Bore Hole Stability
- Shale Stabilization

2. Wellbore Stability

- Mechanical Conditions
- Shale Deposition and Sedimentary Rocks
- Clay Chemistry
- The Earth's Stresses
- Stresses Around Borehole and Borehole Stability
- Mechanical Stress Failure
- Chemical Interactions
- Physical Interactions
- Well Site Analysis
- Borehole Stability Models

3. Stuck Pipe Prevention And Remediation

- Sticking Mechanisms
- Solids Induced Pack-Off
 - First Actions
 - Formation Related Induced Pack-Off: Causes, Description, Preventative Action, Rig Site Indicators, and Freeing Induced Pack-Off Stuck
 - Unconsolidated Formations
 - Mobile Formations
 - Fractured and Faulted Formations
 - Naturally Over-Pressured Shale Collapse
 - Induced Over-Pressured Shale Collapse
 - Reactive Formations
 - Tectonically Stressed Formations
- Mechanical and Wellbore Geometry
 - First Actions
 - Causes, Description, Preventative Action, Rig Site Indicators, and Freeing of Mechanical and Wellbore Geometry
 - Shoe Joint Backs Off
 - Keyseating
 - Undergauge Hole
 - Ledges and Doglegs
 - Collapsed Casing and Tubing
 - Green Cement
 - Junk
 - Cement Blocks

- Differential Sticking
 - First Actions
 - Causes, Description, Preventative Action, Rig Site Indicators, and Freeing of Differential Sticking
- Recognizing Stuck Pipe Mechanism
 - Stuck Pipe Freedom Worksheet
 - Stuck Pipe – Detection Flowcharts
 - Example

4. Hole Monitoring and Recommended Practices

- Hole Monitoring
- Recommended Practices for Stuck Pipe Prevention
- First Responses
- Test and Q&A Session

5. Hole Cleaning in Vertical and Low Angle Wells

- Hole cleaning pre-test and Introduction
- Fluids Mechanics and Rheology
- Hole Cleaning in low and medium angle wells

6. Hole Cleaning in Low, Medium and Horizontal Wells and Recommendations

- Hole cleaning in Low and medium Angle Wells
- Hole Cleaning in high angle and horizontal wells
- Recommended practices for hole cleaning
- Relationship between hole cleaning, ROP and stuck pipe risk

