

Underbalanced & Managed Pressure Drilling: Applications, Design & Operations

5 days

UBD-EN-P

Overview

LEVEL

Skilled

PURPOSE

This course provides a comprehensive and practical knowledge of non-conventional techniques used in advanced drilling and completion processes to enhance drilling performance and oil recovery.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

- deal with issues of narrow pore/fracture pressure gradient windows, lost circulation, abnormal pressures, kick/loss situations,
- drill wells in depleted reservoirs,
- acquire basic concepts of managed and underbalanced pressure drilling,
- review various managed pressure drilling methods and equipment,
- identify typical situations calling for managed pressure drilling and assess potential benefit,
- review typical applications, equipment and operation of underbalanced drilling.

WAYS AND MEANS

Several case studies and examples are discussed.

LEARNING ASSESSMENT

Exercises, quiz, written exam.

PREREQUISITES

Understanding the conventional drilling operations.
Well architecture and casing design knowledge.

Agenda

BASIC PRINCIPLES OF MANAGED PRESSURE DRILLING

1 d

History, objectives and definitions.
Occurrence and implications of narrow pore and fracture pressures windows on well design and well control.
Dynamic factors affecting bottom hole pressure.
Mathematics and examples.

MUD CAP DRILLING

0.5 d

History of mud cap drilling.
Pressurized and floating mud cap.
Mud cap operation.

MANAGED PRESSURE DRILLING EQUIPMENT

0.5 d

Rotating control devices.

Chokes.

Drill pipe non return valves and downhole annular valves.

ECD reduction tools.

Coriolis flowmeter, friction pump.

MANAGED PRESSURE DRILLING USING PRESSURE AS PRIMARY CONTROL

1 d

Introduction, open and closed back pressure systems.

Automated back pressure system technology.

Continuous circulating system technology.

MANAGED PRESSURE DRILLING USING FLOW AS PRIMARY CONTROL

1 d

Process description.

Equipment and technology.

Applications.

UNDERBALANCED DRILLING

0.5 d

Underbalanced drilling objectives and applications.

Underbalanced drilling equipment and operations.

CONCLUSION

0.5 d

Advantages of managed and underbalanced drilling.

Potential and limitations.

Typical applications.