

**DRL057** 

# **Drilling for Non-Drilling Engineers**

### **Course Description**

This course is designed for non-drilling engineers who are involved in drilling operations or have an interest in understanding the key principles of drilling engineering. It provides a comprehensive introduction to the concepts, technologies, and practices involved in drilling for oil and gas. Participants will learn about the drilling process, equipment, well control, and the role of engineers in managing drilling operations. The course focuses on providing non-drilling engineers with a solid foundation of knowledge to collaborate effectively with drilling teams and contribute to successful well delivery.

#### **Course Objectives**

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

- Understand the basic principles and processes involved in drilling operations.
- Identify the key components and equipment used in drilling rigs and their functions.
- Grasp the fundamentals of well control, safety, and risk management in drilling operations.
- Understand the role of different engineering disciplines in drilling operations.
- Familiarize with the various types of wells and drilling techniques.
- Communicate effectively with drilling teams and contribute to problem-solving during operations.
- Gain an understanding of the challenges and innovations in modern drilling engineering.

#### **Who Should Attend**

- Non-drilling engineers who want to expand their knowledge of the drilling process.
- Engineers from other disciplines (e.g., reservoir, production, mechanical, civil, etc.) working in the oil and gas industry.
- Technical professionals seeking a comprehensive overview of drilling operations.
- Anyone involved in multi-disciplinary teams with drilling operations who needs a basic understanding of drilling engineering.

#### **Course Duration**

5 Working Days



# **Course Outlines**

### 1. Introduction to Drilling Engineering

- Overview of the drilling process and its importance in oil and gas production.
- The role of drilling engineers and non-drilling engineers in drilling operations.
- Key terms and concepts in drilling engineering.

#### 2. Drilling Rig and Equipment

- Components of a drilling rig and their functions.
- Drilling equipment: drill bits, top drive systems, mud pumps, and blowout preventers (BOPs).
- Types of drilling rigs and their applications.

#### 3. The Drilling Process

- Well planning: site selection, well design, and cost estimation.
- Drilling a well: surface hole, intermediate hole, and production hole.
- Mud systems, drilling fluids, and circulation.

# 4. Well Control and Safety

- Introduction to well control principles and blowout prevention.
- The role of the blowout preventer (BOP) stack.
- Safety measures and risk management in drilling operations.

#### 5. Drilling Challenges and Problem-Solving

- Common challenges in drilling operations: wellbore instability, stuck pipe, lost circulation.
- Techniques to mitigate drilling problems and optimize operations.
- Collaboration between non-drilling engineers and drilling teams to solve challenges.

# 6. Types of Wells and Drilling Techniques

- Vertical, directional, and horizontal wells: definitions and applications.
- Advanced drilling techniques: Managed Pressure Drilling (MPD), Underbalanced Drilling (UBD).
- The future of drilling: innovations and emerging technologies.



#### 7. Drilling Fluids and Mud Systems

- The role of drilling fluids in the drilling process.
- Properties and functions of drilling mud.
- Fluid circulation, wellbore stability, and contamination control.

### 8. Post-Drilling Operations

- Well completion and testing processes.
- Transitioning from drilling to production.
- Case studies of successful drilling operations and lessons learned.

