N615: Introduction to Offshore Drilling

Instructor(s): Richard Heenan

2 Days	Competence Level: Awareness
Classroom Course	

Summary

This course provides an overview of the phases, operations, and terminology used in the drilling and completion of offshore oil and gas wells. It will provide participants with an understanding of the issues faced in all aspects of drilling operations, from well construction through to drilling, completion, testing and production. Sea bed and floating units are covered.

Learning Outcomes

Participants will learn to:

1. List the variables that determine rig selection.
2. Recognize the types of drilling units in use today.
3. List the components of a drilling rig.
4. Outline the stages of planning and drilling a well and list the tools required for each stage.
5. Identify the types of drilling fluids and how they are selected.
6. Explain the need for casing a well.
7. Discuss formation evaluation from cuttings, cores and logs.
8. Describe positioning, risers and BOP controls.
9. Understand the role of ROVs.
10. List the types of offshore production systems.

Duration and Training Method

This is a two-day course. Participants will earn 1.6 CEUs (Continuing Education Credits) or 16 PDHs (Professional Development Hours).

Who Should Attend

The course is intended for non-drilling personnel looking for an understanding of offshore drilling. This includes marine and logistics personnel, accounting, administrative and support staff, environmental professionals and new-hire geoscience and engineering staff.

Prerequisites and Linking Courses

No prior experience of knowledge of drilling operations is required.

A related course is N614 (Fundamentals of Directional Drilling). Aspects of drilling are also addressed in N607 (Petroleum Engineering for Non-Engineers), N422 (Reservoir Engineering for Non-Engineers) and N940 (Modern Completion and Production Enhancement Techniques).

Course Content

Day One

The focus is on drilling and related operations on bottom-founded drilling units. These include jackups, fixed production platforms (jackets), swamp barges, tender rigs, and gravity based structures (GBS).

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1. Petroleum Introduction
    - Basic petroleum geology
    - Porosity and permeability
    - How petroleum is formed
    - Petroleum traps (reservoirs)
2. Well Design and Construction
    - Concepts and considerations in designing a well
3. Types of Bottom Founded Offshore Rigs
    - Jackups, fixed production platforms (jackets), swamp barges, tender rigs, and gravity based structures (GBS)
4. Drilling Rig – Components and Functions
    - Hoist and rotary
    - Mud system
    - Drillstring
    - Blowout preventer system (surface stacks)
5. Personnel and Contracts
    - Personnel and responsibilities on a rig
    - Offshore conditions and lifestyle
    - Rig contract formats
6. Drilling an Example Well from Top to Bottom (this introduces the various activities as they are encountered during the drilling of the well)
    - Drill bits
    - Drilling fluids
    - Drillstring operations (making a connection and tripping)
    - Casing and cementing
    - Formation evaluation

Day Two

Builds on the concepts of the first day by introducing the additional issues that arise in floating drilling operations, and discusses additional topics including completions, directional drilling, offshore support operations, and offshore production concepts.

1. Personnel on a Floating Offshore Drilling Rig
2. Types of Floating Offshore Rigs
    - Drillships
    - Semisubmersibles
3. Additional Considerations for a Floating Drilling Operation
    - Rig positioning - anchoring and dynamic positioning (DP)
    - Motion compensation
    - Subsea blowout preventer systems (BOPs) and riser (components and operation)
4. Support of Offshore Operations
    - Divers and ROVs
    - Supply boats
    - Personnel transportation
5. Completions (brief overview)

- Typical completion - tubing conveyed perforation (TCP)
- Acidizing and hydraulic fracturing
- Multi-zone completions

6. Directional Drilling and Relief Wells
7. Offshore Production Systems
   - Bottom founded & floating production options
   - Workover options for offshore wells
   - FPSOs and offshore pipelines

Auxiliary Material - added if time permits

1. Fishing
2. Well Control