

A LDI Training Course

INTRODUCTION TO DRILLING ENGINEERING

By

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Course Objective

This course covers the basic overview in drilling engineering with an emphasis on field applications. Topics covered include well Rotary Drilling processes; Drilling Fluids; Drilling Cements; Drilling hydraulics, Rotary Drilling Bits, Formation Pore Pressure and Fracture Pressure, Casing Design and Directional Drilling and Control. Drilling Exercise will also be given to the participants during the individual topics. The objective is to develop an understanding and a working knowledge of Drilling Engineering concepts and to be able to use fundamental engineering principles for well design.

By completion of the course, you will be able to understand the concepts of wells design, use and calculate drilling parameters to drill a well effectively, write a simple Drilling Program and understand the principle and calculation used in the design process and fundamental calculations for a well design.

What you will learn

You will learn the following:

- Rotary Drilling
- Drilling Fluids
- Cements
- Drilling Hydraulics
- Rotary Drilling Bits
- Formation Pore Pressure and Fracture Pressures
- Casing Design
- Directional Drilling and Control

Course Outline

Rotary Drilling

1. Drilling Team
2. Drilling Rig
3. Drilling Rig Power System

4. Hoisting System
5. Circulating System
6. The Rotary System
7. Well Control System
8. Well Monitoring System
9. Special Marine Equipments
10. Drilling Cost Analysis

Drilling Fluids

1. Diagnostic Test
2. Pilot Test
3. Water Based Muds
4. Inhibitive Water Based Muds
5. Oil Muds

Cements

1. Composition of Portland Cement
2. Cement Testing
3. Standardization of Drilling Cements
4. Cement Additives
5. Cement Placement Techniques

Drilling Hydraulics

1. Hydrostatic Pressure in Liquid Columns
2. Hydrostatic Pressure in Gas Columns
3. Hydrostatic Pressure in Complex Fluid Columns
4. Annular Pressure During Well Control Operations
5. Bouyancy
6. Non Static Well Conditions
7. Rheological Models
8. Rotational Viscometer
9. Laminar Flow in Pipe & Annuli
10. Initiating Circulation of a Well
11. Jet Bit Nozzle Selection
12. Pump Pressure Schedules for Well Control Operations
13. Surge Pressures Due to Vertical Pipe Movement
14. Particle Slip Velocity

Rotary Drilling Bits

1. Bit Types
2. Rock Failure Mechanism
3. Bit Selection and Evaluation
4. Factor Affecting Tooth Wear
5. Factor Affecting Bearing Wear
6. Terminating a Bit Run
7. Factor Affecting Penetration Rate
8. Bit Operation

Formation Pore Pressure and Fracture Pressure

1. Formation Pore Pressure
2. Methods for Estimating Pore Pressure
3. Formation Fracture Resistance
4. Methods for Estimating Fracture Resistance

Casing Design

1. Manufacture of Casing
2. Standardization of Casing
3. API Casing Performance Properties
4. Casing Design Criteria
5. Special Design Criteria

Directional Drilling and Deviation Control

1. Definition and Reasons for Directional Drilling
2. Planning the Directional Well Trajectory
3. Calculating the Trajectory of the Well
4. Planning the Kick Off and Trajectory Change
5. Directional Drilling Measurement
6. Deflection Tools
7. Principles of the BHA
8. Deviation Control

Who Should Attend

The course is targeted for new Drilling Engineers who has less than 1 year of drilling experience and for Drilling Supervisors that has not been exposed to Drilling Engineering. The course is also suitable for other Engineers working on the Rig such as Mud Engineers, and Directional Engineers.

Why You Should Attend

This Course provides a complete coverage of Drilling Engineering Material for young Drilling Engineers. By completion of the Course, Participants is expected to better understand the physics behind Drilling Engineering concepts. The participants is expected to be able to write a simple Drilling Program.

LDI Training ensures that our instructor, learning tools and resources will provide course attendants with up-to-date knowledge for direct applications in their professional duties. It will also enable them to extrapolate and extend the provided information to related problems In different industrial situations. By requesting preliminary information about the technical back-ground of our participants we make sure that the course is taught at the appropriate level thus maximizing individual benefit. Furthermore we encourage a comprehensive and fully explorative question and answer teaching style.

Your Instructor

Ir. Faried Rudiono

He received a Bachelor degree in Mechanical Engineering from Bandung Institute of Technology (ITB) in 1983. From then on he went to work for Mobil Oil Indonesia as a drilling engineer. He was assigned to the United States 3 times in 1990-2001 in Louisiana working in the Gulf of Mexico, then in 1995-2000 working as an engineer in the International Drilling Services division, and then moving on to Mobil Producing Nigeria as Drilling Engineering Manager from 2000 to 2003. He was assigned back to

Houston in 2005-2006 as Project Staff working on various projects in Australia, Papua New Guinea and Vietnam. He then was called back home to become the Banyu Urip Drilling Manager. He left ExxonMobil in 1998 to join Pertamina as Operational Director and eventually CEO and President Director of Pertamina Drilling Services Indonesia (PDSI). He has close to 35 years experience in the Drilling business and has gone through all aspects of Drilling sub divisions in Engineering and Operational aspect. He retired from PDSI in 2015.