Introduction to Drilling & Well Operations

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Introduction:

This course is intended for individuals who need to work closely with drilling operations; to give a complete understanding of the processes involved in the drilling of oil and gas wells. This introductory course gives an overview of drilling and well operations, drilling systems and challenges in the drilling industry.

It will provide the candidates with a basic understanding of drilling and well technology and terminology. It is designed to present the theory of drilling and the rig site. The course offers a complete overview of the drilling process starting at the well planning stage and concluding with production.

Designed to be accessible by those with no experience in the industry, it serves to assure a base level of fundamental drilling knowledge to act as a foundation for any further training in drilling. The course delivers a comprehensive introduction to the drilling industry working from fundamental basics through to functional descriptions of many of the techniques and equipment used in current drilling operations. To reinforce the learning opportunities there will be simple exercises requiring a basic understanding of mathematics.

Who Should Attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Work over Engineers, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production Engineers, Well site Engineers, Foremen, and Industry Personnel

Course Objectives:

By the end of this course delegates will be able to:

- Name the most important parties involved in the drilling of a well
- Gain an overview of drilling technology to develop an awareness of the equipment terminology and operations associated with the drilling process
- Describe some of the organization structures onboard and onshore
- Describe the main functions of a drilling rig and it's equipment
- Understand some of the most common terms used in the oilfield
- Learn about classification of drilling methods
- Know the principles of rock tool interaction in drilling
- Acquire the definition and terminology
- Identify the application of different drilling methods
- Know the selection of drills
- Understand the methods of measuring drilling performances
- Conform to current safety practices
- Know drilling trends and new technology
- Learn basic communications and supervisory skills to ensure a safe, efficient operation

Course Outline:

Well Construction Overview:

- Where drilling fits in the E&P process and interaction with other domains
- What information is required and available from well construction group?
- The different risks involved in well construction
- Roles and responsibilities of the well site and office drilling team
- Different rig types and main equipment used in well construction

Well Design Overview:

- The well planning/design process including data inputs e.g. Pore Pressure, Frac Gradient, rock mechanics, lithology and completion requirements
- Typical time line for well planning/design and long lead items e.g. rig selection, tubulars and well heads
- Offset well analysis
- Well timing, costs, risks and AFE generation
- Impact of surface constraints in well design e.g. existing wells on pad, anti-collision requirements
- Impact of rig capability in well design
- Drilling fluid selection including drilling performance, environmental constraints and formation damage
- Basic Casing and Cementing

Directional Drilling & Deviation Control:

- Types of directional wells and their applications
- Different deflection tools and directional BHAs and their functions
- Bit types, features and their application
- Understanding of the log data and offset information with respect to drilling requirements

- Capabilities of steerable systems (Motors, turbines and RSS)
- Geodetics and coordinate systems
- Requirements of wellbore surveying and the effect on target sizing

Well Control:

- Causes of kicks, prevention, detection; and significance of underground and surface blowouts
- Causes and significance of shallow gas including prevention through use of shallow gas seismic surveys
- Typical well control equipment including drilling BOPs, wire line pressure control equipment, Christmas trees
- Well Execution and Operations
- Well construction activities (e.g. casing, logging, cementing, and completions) required to meet the specified well objectives
- Typical drilling problems including stuck pipe, kicks, wellbore instability and lost circulation including the causes and mitigation
- Operational risks e.g. Rig equipment failures and potential consequences

- Real-time operations
- The real-time concept and infrastructure
- The various applications of real-time monitoring
- The value of the real-time measurements
- The interpretation of the real-time measurements