Integrated Geological Well Planning and Operations

Course Price

£2950

Course Description

The aim of this course is to practically demonstrate how wells are planned and executed taking into consideration the inputs of various discipline. This integrated approach will be facilitated across discipline understanding and responsibilities of each team member. At the end of this course, participants will be exposed to hands on steps in planning and executing different well objectives. Delegates will also understand the methodology and techniques used in generating geological and formation pressure prognosis for exploration, appraisal and development wells.

Course Objectives

Who Should Attend

This short course is intended for members of multidisciplinary asset teams including geoscientists, reservoir petroleum and drilling engineers. Asset teams comprise of multidisciplinary team members all working together to achieve a common objective. To accomplish this, they must not only understand each other’s technical discipline, but should also contribute to each other’s efforts and support the business for cost effective planning and operation. Consequently, different aspects of geological well planning such as geological prognosis, formation pressure prediction, wellbore stability and trajectory planning will be discussed. Well site and petrophysical methods will be utilized in an integrated method that highlights the role and relevance of various disciplines to achieve well objective.

Course Content

- Understanding the Petroleum system
- Health Safety, Environment
- Rock Classification: Carbonate and Siliciclastics
- Well site and operations geologists duties and responsibilities
- Drilling rig systems and components: Land, Swamp, semi submersible and drill ships
- Well planning: Defining well objective (Exploration, Appraisal, development) Location preparation, coordinate reference systems, contractor evaluation and selection, geological prognosis, trajectory plan, formation pressure prediction, earth stress system and 1D mechanical earth model
- Well site Method: Depth, block height, ROP, Survey measurement, drilling fluids, over pressure
detection, equivalent circulating density, equivalent static density, well site calculations, casing point selection cementing, well control procedures.

- mudlogging equipment, parameter monitoring and interpretation, sample description, gas monitoring and analysis, show evaluation
- Conventional Coring/Sidewall, special cores and core point picking and drill stem testing
- Measurement while drilling and wireline Methods: Open hole tools, cased hole tools, pressure and fluid sampling, dipmeters, borehole imaging devices, depth Shifting, determination of water resistivity, quick look interpretation, formation evaluation of naturally fractured reservoirs
- Directional Drilling and Geosteering tools Pre-well model generation –Forward and Inversion modeling Geometric placement and other Geosteering method
- Structural geology and fundamental geomechanics: fractures, faults, borehole geology Drilling and subsurface risk identification, mitigation and management
- Data management, after action review and Report writing

Day 1
Elements of Petroleum System
- Source Rock
- Migration Pathway
- Reservoir
- Traps/Seal
- Time

Health Safety & Environment
- HSE Management System
- Survival course
- Personal protective equipment
- Job risk Analysis
- Work permit
- Safety cards
- Safety Pyramid

Reservoir Geology
- Carbonate and Clastic rock Overview
- Rock Fabric and Classification
- Depositional Environment

Wellsite and Operations Geology
- Operations Geologist role and tasks
- Wellsite geologist duties and responsibilities
- Data Management Tools

Structural Geology
- Structural geology and fundamental geomechanics
- fractures, faults, borehole geology
- Image log Interpretation

Well Planning Requirement & Procedure
- Defining Well Objective(s) (Exploration/Appraisal/Development)
- Contractor Evaluation & Selection
- Location Preparation-Surface/Subsurface risk identification, mitigation and management
- Coordinate Reference Systems
- Geological Prognosis- Exploration, Appraisal and Development wells
- Well Trajectory Planning, Formation Pressure Prediction
- Earth Stress System & 1-D Mechanical Earth Model
Day 2
Well Site Procedures:
• Fundamental Concept Of Depth Measurement and Referencing
• Block Height, Rate Of Penetration and other drilling parameters
• Survey Measurement & Calculation TVD TVT TST
Drilling Operations: Components and accessories
• Hoisting system
• Circulation system
• Rotary system
• Circulation System
• Drill Bits
• Oil and water base mud
• Casing Strings
Well Site Calculations
• Overbalance And Underbalanced Drilling, Equivalent Circulating Density, Equivalent Static Density,
• Leak Off Test Well Control Procedures
Mudlogging
• Mudlogging Equipment, Parameter Monitoring And Interpretation, Sample Description, Gas Monitoring & Analysis, Show Evaluation, Wetness ratio and hydrocarbon balance
Coring
• Conventional Coring, Sidewall coring & Special Cores
• Core Point Picking And Drill Stem Testing

Day 3
Measurement while drilling and wireline Methods:
• Open hole tools, cased hole tools, pressure and fluid sampling
• Difference between LWD and wireline measurement
• Depth of investigation and Vertical resolution
• Depth Shifting
• Determination of water resistivity
• Quick look interpretation,
• Formation evaluation of naturally fractured reservoirs

Day 4
Directional Drilling and Geosteering
• Short, medium and long radius wells, Extended reach wells
• Geosteering tools
• Geosteering Methodology
  o Pre-well model generation
  o Forward and Inversion modeling
• Geometric placement
• Geosteering with reservoir model
• After action review
• Report writing
CPD Unit

Continuing Professional Development

28 HOURS CPD