PETROLEUM TRAINING COURSES

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CONTENTS

INTRODUCTION

DRILNET is specialized in the technology transfer in the petroleum and para petroleum sector. Our expertise covers all sectors of the oil industry: Oil, Gas and Energy Project Management, Exploration, Production, Development, Refining and Logistics, but also Safety, Maintenance and Management.

Training is the first activity of our company, that has been accredited since 2000 by the French competent bodies as a training center under the number 93 13 0999613. Thus, we are entitled to offer training services: training engineering (training needs audit, training programs creation, manual editing), conventional training presentation (in premises and on site), coaching (on-the-job training), blended learning and e-learning. In addition to this, DRILNET offers the possibility to train your future trainers.

We are recognized worldwide as an expert in this field, as we train the personnel of the biggest international petroleum companies. DRILNET develops drilling training programs and trains engineers and technicians of international companies such as ADCO (UAE), BOUMERDES UNIVRSITY (Algeria), COFOR (France), DELTAWELL (Italy), DIETSMANN (Monaco), DRILLMEC (Iraq, Italy), ENI and ENI CORPORATE UNIVERSITY (UAE, Malaysia, Kazakhstan, Iraq, Italy), FORASOL (France), GAZ DE FRANCE (France), GSP (Romania), GTSC (UAE), HALLIBURTON (Algeria), OMV-PETROM (Romania), PRIDE (France, Kazakhstan), POLITECHNICO (Italy), RST GLOBAL SOLUTIONS (Singapore, Netherlands, UAE), SCHLUMBERGER (France, UK, Algeria), SONATRACH (Algeria), TNK-BP ROSNEFT (Russia), TOTAL (France, Syria) and others.

Through our partnerships and associations we provide all existing certifications: **American Safety & Health Institute, AWS, Chartered Institute of Environmental Health, Crane Certification Association of America, Croix Rouge Internationale, Emergency First Response, IADC, IASST, IMI Awards, IOSH Managing Safety, LEEA, MCA, National Safety Council, NEBOSH, NFPA, OPITO, STCW 95, UK Spill, etc.**

DRILNET is a proud Member of the **Society of Petroleum Engineers**, the **International Well Control Forum** and also the **Romanian Association of Drilling Contractors.**

The training catalogue represents an assembly of technical guide sheets. The durations and the subjects introduced can be adapted in accordance with the context and the objectives of the client. Depending on your needs, you can choose a course in our training catalogue, and we propose to help you to adapt it in accordance with your objectives and your means.

You will find hereafter a list of petroleum courses covering well construction, fluids & cement, well completion & workover, production optimization, new technologies and reservoir topics, and also IADC and IWCF certified courses.

All training programs can be developed for different skill levels depending on client's request. The basic level training can be presented as introductory (in 3 days instead of 5 as for basic course). Also, any training program can be developed as an advanced or specialization level training to meet the client's specific needs and requirements. The duration of such training can vary from 1 to several weeks or planned out over a period.

All training courses can be completed by the practical application period on site.

In addition to the courses listed hereafter, we propose general training programs. You can receive the related catalogue upon request.

WELL CONSTRUCTION					
Course Title	**Who should attend**	**Level**		**Duration**	**Content**
Introduction to Petroleum Industry	• Operating staff beginners • Clerical and support services staff	Basic	x	5 days	**Page 15**
		Advanced			
		Specialization*			
Introduction to Drilling Theoretical Training	• Engineers and technicians interested but not involved in drilling	Basic	x	4 days	**Page 16**
		Advanced			
		Specialization*			
Introduction to Drilling Practical Training	• Drilling staff beginners before their first job experience on the on land drilling rig	Basic	x	5 days	**Page 17**
		Advanced			
		Specialization*			
Drilling Rigs & Rig Equipment	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 18**
		Advanced	x	10 days	
		Specialization*	x	15 days	
Drilling Rig & Rig Inspection	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 20**
		Advanced			
		Specialization*			
Rig Mud Equipment & Mud System	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 21**
		Advanced			
		Specialization*			

WELL CONSTRUCTION

Course Title	Who should attend	Level		Duration	Content
Rig Mud Equipment, Mud System & Laboratory	• Drilling supervisors • Drilling engineers • Operations engineers	Basic		15 days	**Page 21**
		Advanced	x		
		Specialization*			
Well Construction: Drilling Materials, Equipments & Operations	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 22**
		Advanced	x	10 days	
		Specialization*			
Drilling Engineering: Geology & Reservoir	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 24**
		Advanced			
		Specialization*			
Well Monitoring	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 25**
		Advanced			
		Specialization*			
Well Construction: Drilling Engineering	• Drilling superintendents, • Drilling supervisors • Drilling engineers • Completion engineers • Operations engineers	Basic	x	5 days	**Page 26**
		Advanced	x	10 days	
		Specialization*	x	20 days	
Drilling Practices & Operations	• Drilling supervisors • Drilling engineers • Operations engineers	Basic		10 days	**Page 27**
		Advanced	x		
		Specialization*			

WELL CONSTRUCTION					
Course Title	**Who should attend**	**Level**		**Duration**	**Content**
Rig Sizing	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 28**
		Advanced			
		Specialization*			
Drill String, BHA & Design	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 29**
		Advanced			
		Specialization*			
Casing Design	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 30**
		Advanced			
		Specialization*			
Borehole Instability & Common Drilling Problems (Stuck Pipe, etc.)	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 31**
		Advanced	x	10 days	
		Specialization*	x	15 days	
Fishing Tools & Operations	• Drilling supervisors • Drilling engineers • Operations engineers	Basic		5 days	**Page 33**
		Advanced	x		
		Specialization*			
Back Off & Side Track	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 34**
		Advanced			
		Specialization*			

WELL CONSTRUCTION					
Course Title	**Who should attend**	**Level**		**Duration**	**Content**
Directional Drilling	• Drilling engineers • Production engineers • Operations engineers • Drilling supervisors • Toolpushers • Managers • Technical support personnel	Basic	x	5 days	**Page 35**
		Advanced			
		Specialization*			
Drilling Bit Technologies	• Drilling engineers • Drilling supervisors • Toolpushers • Drillers • Managers • Technical support personnel	Basic		5 days	**Page 36**
		Advanced	x		
		Specialization*			
Coring Technologies	• Drilling engineers • Drilling supervisors • Toolpushers • Drillers • Managers • Technical support personnel	Basic	x	5 days	**Page 37**
		Advanced	x	10 days	
		Specialization*			
Introductory Course to Well Control	• Roughnecks • Floormen • Roustabouts • Derrick man • Fluids engineer • Drilling engineers & technicians beginners	Basic	x	5 days	**Page 38**
		Advanced			
		Specialization*			
Well Control	• Assistant driller • Driller • Toolpusher • Superintendents & supervisors (Drilling / Fluids & Cement / Production / HSE) • Technicians & engineers	Basic		5 days	**Page 39**
		Advanced	x		
		Specialization*			
Well intervention	• Engineers and technicians who are involved in the planning and realization of well intervention operations as wireline, coiled tubing, snubbing	Basic		5 days	**Page 41**
		Advanced	x		
		Specialization*			

FLUIDS & CEMENT					
Course Title	**Who should attend**	**Level**		**Duration**	**Content**
Drilling Fluids Technologies	• Drilling engineers • Fluids & cement engineers • Drilling supervisor • Fluids & cement supervisor • Toolpusher	Basic		10 days	**Page 42**
		Advanced	x		
		Specialization*			
Drilling Fluids Technologies & Laboratory	• Drilling engineers • Fluids & cement engineers • Drilling supervisor • Fluids & cement supervisor • Toolpusher	Basic		15 days	**Page 42**
		Advanced	x		
		Specialization*			
Drilling Fluids & Solids Control	• Drilling engineers • Fluids & cement engineers • Drilling supervisor • Fluids & cement supervisor • Toolpusher	Basic	x	5 days	**Page 44**
		Advanced			
		Specialization*			
Cementing Technologies	• Drilling engineers • Fluids & cement engineers • Drilling supervisor • Fluids & cement supervisor • Toolpusher	Basic	x	5 days	**Page 46**
		Advanced	x	10 days	**Page 48**
		Specialization*			
Cementing Technologies & Laboratory	• Drilling engineers • Fluids & cement engineers • Drilling supervisor • Fluids & cement supervisor • Toolpusher	Basic		15 days	**Page 48**
		Advanced	x		
		Specialization*			
Drilling Fluids & Cement Technologies & Practices	• Senior technicians • Mud engineers • Any other personnel involved in operations	Basic		17 weeks	**Page 49**
		Advanced			
		Specialization*	x		

PRODUCTION OPTIMIZATION

Course Title	Who should attend	Level		Duration	Content
Well Testing	• Production supervisor • Production engineer • Any other personnel involved in E&P operations as a coordinator	Basic	x	5 days	**Page 51**
		Advanced			
		Specialization*			
Artificial Lift: Gas Lift	• Reservoir engineers • Petroleum engineers	Basic	x	5 days	**Page 52**
		Advanced			
		Specialization*			
Water Injection Operations	• Oil & Gas technicians	Basic	x	1 day	**Page 53**
		Advanced			
		Specialization*			
Introduction to Hydraulic Fracturing	• Oil and gas industry executives, managers, and directors • Legal personnel • Financial institutions • Engineers in energy extraction and production • Governmental and community	Basic		2 days	**Page 54**
		Advanced	x		
		Specialization*			
HP/HT Well Drilling	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 55**
		Advanced			
		Specialization*			
Pore Pressure Determination	• Drilling supervisors • Drilling engineers	Basic		5 days	**Page 56**
		Advanced	x		
		Specialization*			
Daily Monitoring of Wells	• Production engineers • Production technicians	Basic	x	5 days	**Page 57**
		Advanced			
		Specialization*			

NEW TECHNOLOGIES					
Course Title	**Who should attend**	**Level**		**Duration**	**Content**
Managed Pressure Drilling (MPD)	• Drilling Engineers • Mud Engineers • Superintendents • Supervisors • All professionals involved in well planning and operations	Basic		5 days	**Page 58**
		Advanced	x		
		Specialization*			
Under Balanced Drilling	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	5 days	**Page 59**
		Advanced			
		Specialization*			
Coil Tubing Technologies	• Drilling engineers • Production engineers • Operations engineers • Drilling supervisors • Production supervisors • Toolpusher • Managers • Technical support personnel	Basic	x	5 days	**Page 60**
		Advanced			
		Specialization*			
Casing While Drilling	• Drilling supervisors • Drilling engineers • Operations engineers	Basic	x	2 days	**Page 61**
		Advanced			
		Specialization*			

COMPLETION & WORKOVER

Course Title	Who should attend	Level		Duration	Content
Well Completion	• Drilling engineers • Production engineers • Operations engineers • Drilling supervisors • Production supervisor • Toolpusher • Managers • Technical support personnel	Basic	x	5 days	**Page 62**
		Advanced			
		Specialization*			
Well Testing - DST	• Production engineers • Operations engineers • Drilling supervisors • Production supervisor • Toolpusher • Managers • Technical support personnel	Basic	x	5 days	**Page 63**
		Advanced			
		Specialization*			
Wireline Logging & Slickline Operations	• Production engineers • Operations engineers • Drilling supervisors • Production supervisor • Toolpusher • Managers • Technical support personnel	Basic	x	5 days	**Page 64**
		Advanced			
		Specialization*			
Well Completion Engineering	• Production engineers • Operations engineers • Drilling supervisors • Production supervisor • Toolpusher • Managers • Technical support personnel	Basic		10 days	**Page 65**
		Advanced	x		
		Specialization*			

RESERVOIR

Course Title	Who should attend	Level		Duration	Content
Reservoir	• Petroleum engineers • Reservoir engineers • Production engineers • Geologists	Basic	x	5 days	**Page 67**
		Advanced			
		Specialization*			

*Specialization courses are organized on the client's request according to their training specifications

CERTIFIED COURSES					
Course Title	**Who should attend**	**Level**	**Duration**	**Certification**	**Content**
Introductory Course to Well Control	Any personnel working on the rig who needs an introductory training in well control	L2	5 days	**IWCF**	**Page 68**
Well Control	Anyone involved in drilling and/or well control operations in a non-supervisory position: all positions from floorman to driller inclusive	L3	5 days	**IWCF**	**Page 69**
Well Control	Anyone involved in drilling and/or well control operations: all positions from driller inclusive	L4	5 days	**IWCF**	**Page 70**
Introductory Course to Well Intervention	Any personnel working on the rig who needs an introductory training in well intervention	L2	5 days	**IWCF**	**Page 71**
Well Intervention	Engineers and technicians who are involved in the planning and realization of well intervention operations as wireline, coiled tubing, snubbing	L3	5 days	**IWCF**	**Page 72**
Well Intervention	Engineers and technicians who are involved in the planning and realization, and supervising of well intervention operations as wireline, coiled tubing, snubbing	L4	5 days	**IWCF**	**Page 73**
Introductory Course to Well Cap	Any personnel working on the rig who needs an introductory training in well control	L2	5 days	**IADC**	**Page 74**

CERTIFIED COURSES					
Course Title	**Who should attend**	**Level**	**Duration**	**Certification**	**Content**
Well Cap	Anyone involved in drilling and/or well control operations in a non-supervisory position: all positions from floorman to driller inclusive	L3	5 days	**IADC**	**Page 75**
Well Cap	Anyone involved in drilling and/or well control operations: all positions from driller inclusive	L4	5 days	**IADC**	**Page 76**
Introductory Corse to Well Intervention	Any personnel working on the rig who needs an introductory training in well intervention	L2	5 days	**IADC**	**Page 77**
Well Intervention	Engineers and technicians who are involved in the planning and realization of well intervention operations as wireline, coiled tubing, snubbing	L3	5 days	**IADC**	**Page 78**
Well Intervention	Engineers and technicians who are involved in the planning and realization, and supervising of well intervention operations as wireline, coiled tubing, snubbing	L4	5 days	**IADC**	**Page 79**

INTRODUCTION TO PETROLEUM INDUSTRY

Duration: 5 days

Objectives

This 5-day introductory course is designed to provide non-technical personnel in the petroleum industry with fundamental understanding of the upstream and the downstream petroleum industry.

The participants will have a condensed presentation of various activities within these two sectors. The course explains the business, operations, processes and technologies in the exploration, production, refining and transportation of hydrocarbons. The course will teach the structure and dynamics of the industry and will also provide the basic fundamentals as well as the terminology used.

Upon completion of this course the trainees will have a good approach to challenges, constraints and methods used in upstream and downstream petroleum sectors. They will also be familiar with the various actors involved in these sectors. Your staff will feel sufficiently familiar with the industry to function more effectively with their co-workers and, due to increased confidence and knowledge, their productivity will improve

Who should attend

- Operating staff beginners
- Clerical and support services staff (secretariat, management, logistics, legal, communication, etc.).

Prerequisite

None

Program

- Introduction to geology
- Exploration
- Exploration drilling
- Development
- Production
- Well design
- Drilling Rig Crew organization
- Refining
- Transportation of Petroleum

INTRODUCTION TO DRILILING THEORETICAL TRAINING

Duration: 4 days

Objectives

To provide a comprehensive overview of drilling techniques and operations:

- ✓ To acquire the vocabulary specific to drilling
- ✓ To review drilling operations and equipment
- ✓ To learn about roles and responsibilities of different professionals involved in drilling

Who should attend

Engineers and technicians interested but not involved in drilling: geologists, geophysicists, reservoir engineers, completion, production and process staff, platform designers, economists, etc.

Prerequisite

None

Program

ORGANIZATION OF DRILLING OPERATIONS

- Drilling principle
- Cost, duration of a drilling job
- Different people involved, types of contracts
- Safety

WELL ARCHITECTURE

- Reservoir notions
- Functions of different casings
- Parameters to be taken into account to determine well architecture
- Examples of architectures

DRILLING PRINCIPLES - EQUIPMENT

- Different types of bits
- Drilling string
- Drilling rig
- Hoisting function and equipment
- Pumping function and equipment
- Rotating function and equipment
- Power function
- Mud and solid treatment
- BOP

SPECIAL OPERATIONS

- Cementing operations
- Wellhead
- Directional drilling
- Well control
- Fishing
- Wireline logging, well test (DST)

OFFSHORE DRILLING OPERATIONS

- Different types of rigs
- Problems related to their use

WELL COMPLETION

- Reservoir-wellbore interface
- Equipment for flowing wells
- Well intervention

INTRODUCTION TO DRILILING PRACTICAL TRAINING

Duration: 5 days

Objectives

This 5-day introductory course is designed to Drilling staff beginners with fundamental understanding of the drilling and with a first job experience on the well site.

Upon completion of the course, participants:

- ✓ know the drilling equipment and corresponding well techniques,
- ✓ know the different operations,
- ✓ know the functions of the different people involved in drilling,
- ✓ have acquired the specific drilling vocabulary,
- ✓ are ready to join the rig floor team as a floorman beginner

Who should attend

Drilling staff beginners before their first job experience on the on-land drilling rig

Prerequisite

None

Program

THEORETICAL TRAINING: 4 days

- Hydrocarbons
- On site Crews organization
- Drilling team
- HSE considerations
- Security on a well site
- How to be on a drilling rig
- Drilling rig
- Drill string
- Drill string equipment
- Drill bit
- Problems while drilling
- Fishing
- Casing and Cementing - General
- The wellhead
- The Packers
- Drilling fluids
- Pumping equipment
- Mud circuit and mud equipment
- Coring
- Evaluation

PRACTICAL TRAINING: 1 day

Visit and practice on the drilling rig site to acquire a first experience on the rig floor and from the monkey board, going through the power and pump equipment and discovering real material and equipments used for tripping and drilling a well

DRILLING RIGS & RIG EQUIPMENT

Duration: 10 days*

Objectives

This 10-day training course is designed to drilling supervisors, drilling engineers and operations engineering staff to provide with an advanced knowledge on the drilling rig and the rig equipment.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

A basic knowledge on the drilling rig and the rig equipment is required.

Program

DRILLING RIGS
- History and principles of the rotary drilling
- Rig types – classification
- Drilling mast and derricks
- The substructures
- Power installed
- The lifting system

THE DRILLING STRING
- Drill string introduction
- Drill pipe
- Heavy weight drill pipe (HWDP)
- The drill-collars (DC)
- The stabilizers
- Near bit
- Sub et crossover
- The reamers

ROTATING SYSTEMES AND EQUIPMENTS
- Rotary table (RT)
- Kelly bushing & slips
- Kelly
- Swivel

RIG FLOOR TRIPPING EQUIPMENTS
- Introduction
- Tongs for tubular materials
- Tripping procedures

INTRODUCTION TO DRILLING BITS
- Roller bits
- Bits with natural diamonds
- Synthetic diamonds tools

INTRODUCTION TO CASING (Architecture of the well) and Cementing
- Introduction
- Casings
- Cementing

INTRODUCTION TO WELLHEAD - BOP & AUXILIARY EQUIPMENT
- Wellhead
- Well control equipment

PUMPING EQUIPMENT
- Introduction
- The duplex pumps
- The triplex pumps
- Pumps maintenance
- Pump accessories

MEASUREMENTS
- Nature of measurements
- Reasons for measuring
- Measures users
- Measurements presentation
- Other

INTRODUCTION TO THE DRILLING FLUIDS - MUD MEASURING DEVICE
- Introduction
- Drilling fluids functions
- Mud types
- Main mud products: role and use
- Main measuring instruments of the mud

HIGH AND LOW PRESSURE MUD CIRCUITS - MUD PIT EQUIPMENT AND TREATMENTS
- High pressure circuit
- The valves
- Low pressure circuit

INTRODUCTION TO HYDROSTATIC – HYDRODYNAMIC AND KICKS CONTROL
- Necessary concepts of physics for kicks control
- The pressures
- Causes of kicks
- Kick detection while drilling
- Kicks detection while tripping
- Principle of a kick control

SAFETY ON RIG SITE
- Introduction
- Safety equipment for the drillers
- Safety while working
- Handling – lifting – transports
- Gas emanations – H_2S, CO_2, C4, etc
- Fire protection
- First aid

The same course can be delivered in 5 days with less detail on each topic, and inversely in 15 days with a closer look at each theme according to client's needs and requirements.

DRILLING RIG & RIG INSPECTION

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with a basic knowledge on the drilling rig and the rig inspection.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

DRILLING RIGS

- History and principles of the rotary drilling
- Rig types – classification
- Drilling mast and derricks
- The substructures
- Power installed
- The lifting system

DRILLING STRING

- Drill string introduction
- Drill pipe
- Heavy weight drill pipe (HWDP)
- The drill-collars (DC)
- The stabilizers
- Near bit
- Sub et crossover
- The reamers

ROTATING SYSTEMES AND EQUIPMENTS

- Rotary table (RT)
- Kelly bushing & slips
- Kelly
- Swivel

RIG FLOOR TRIPPING EQUIPMENTS

- Introduction
- Tongs for tubular materials
- Tripping procedures

RIG MUD EQUIPMENT & MUD SYSTEM

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with a basic knowledge on the rig mud equipment and the mud system.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

DRILLING FLUIDS FONCTIONS
- Cleaning Of the Well
- Cuttings Suspension
- Sedimentation of Fine Cuttings on Surface
- Lubrication and Cooling Of the Drilling Assembly
- Stability of the Hole
- Formation of Impermeable Mud Cake
- Control of Formation Pressure
- Increase of Rate Of Penetration (ROP)
- Hydraulic Energy Transmission to Tools and Bit
- Downhole Information
- Damage Minimization of Formations
- Control of Corrosion
- Control of Safety and Toxicity

MUD TYPES
- Water Based Mud
- Oil-Based Fluids

MAIN MUD PRODUCTS: ROLE AND USE
- Colloidal Clays
- Organic Colloids
- Thinners and Anti-Flocculants
- Mineral Additives
- Special Organic Products
- Weighting Materials
- Plugging Agents

MAIN MEASURING INSTRUMENTS OF THE MUD
- The Marsh Funnel Viscometer
- Mud Density Scale
- API Filter Press
- Sand
- Ph Measuring Methods
- Level Measurements (And Mud Volumes in the Pits)
- Daily Report of the Derrick-Man (A Derrick-Man Responsibility)

HIGH PRESSURE CIRCUIT
- The pump discharge lines
- The rig floor manifold
- The stand pipe
- The kelly hose
- Connecting elements

THE VALVES
- High pressure (HP) valves
- Low pressure valves

LOW PRESSURE CIRCUIT
- The shale shaker
- The decantation
- Mud degassing
- The hydrocyclones
- Special treatments for solids elimination
- Mud fabrication
- Transfer – pump boosting
- Measures

Two weeks laboratory can be added to the course if the training is done on field or base camp having a mud laboratory

WELL CONSTRUCTION: DRILLING MATERIALS, EQUIPMENTS & OPERATIONS

Duration: 10 days*

Objectives

This 10-day course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with an advanced knowledge on the drilling materials, equipments and operations.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

A basic knowledge on the drilling materials, equipments and operations is required.

Program

RIG EQUIPMENT AND CALCULATIONS

- Driving power and transmission
- The drawworks
- The drilling line
- The reeving
- The usage of drilling pumps

BHA STABILIZATION - VERTICAL DRILLING

- Drilling objective in vertical hole
- Deviation phenomena while drilling dipped and interbedded formations
- BHA selection
- Stabilizations
- Conclusion

BHA – AUXILIARY EQUIPMENTS

- Hole openers
- The shock subs
- The drilling jars
- The safety equipment
- The turbines and downhole motors

BHA – TOTCO INCLINOMETER

- Description of the standard “TOTCO” inclinometer
- Assembly and operation principle of the TOTCO
- Various run-in methods
- Determination of the time setting
- “Directional double recorder” TOTCO

INTERACTIONS BITS / ROCKS

- Introduction
- Inter-actions bit / rock

ROLLER CONE BITS

- Introduction
- Mode of work of tricone bits
- Description and manufacturing
- Tricone characteristics
- Rock bit metallurgy
- Improvement of rock bit technology
- Rock bit classification

FIXED CUTTER BITS (Natural and synthetic diamond bits)

- Introduction
- Mode of work of fixed cutter drill bits
- Diamond bits
- Fixed cutter bits

CORING TECHNOLOGY
- Introduction
- The standard core barrels
- Coring solutions
- Oriented coring
- Core bits
- Coring procedures
- Other coring techniques
- Core analysis

DRILL STRING CALCULATIONS
- Remind of the Archimedes' principle
- Buoyancy factor
- Determination of number of drill collars / WOB

CASING
- Purpose of casing
- Casing specification and classification
- Preparation of the casing
- Running in hole operations
- The liner

WELLHEAD
- Introduction
- Basic design concepts of wellhead
- Casing heads housing
- Casing head spool
- Sealing arrangements between casings
- Tubing head spools
- Valves
- Auxiliary wellhead equipment

BOP AND AUXILIARY EQUIPMENT
- Roles
- Types of bops
- Choice of bops
- Ram type bops
- The annular bop
- Diverter
- Rotating bop
- Choke manifold, kill and choke lines
- Inside bop valve
- Recommendations
- Different bop stack configurations
- Hydraulic control of the BOPs

WELL CONTROL
- International system of units (SI)
- Introduction
- Necessary pressure notions needed for well control
- Causes of kicks
- Kicks detection
- Shut-in procedures in fixed rig (rig equipped with a surface bop)
- Kick calculations
- Kill methods of well control

The same course can be delivered in 5 days with less detail on each topic.

DRILLING ENGINEERING: GEOLOGY & RESERVOIR

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with a basic knowledge on the drilling engineering.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

GEOLOGY

- Introduction
- Geology of your region
- Oil fields and gas fields system
- Marginal marine environments
- Tectonic: folds and faults
- Seismic and logging
- Logging
- Integrated study

INTRODUCTION TO PETROPHYSICS

- Introduction
- Porosity
- Permeability
- Wettability
- Capillary pressure
- Pressures

INTRODUCTION TO HYDROCARBONS

- Introduction
- Requirements for petroleum accumulation
- Kerogen types
- Temperature and time
- Crude oil classifications
- Migration processes
- Petroleum chemistry and thermodynamical analysis
- Subsurface pressure
- Conclusion

INTRODUCTION TO RESERVOIR & DRIVE MECHANISMS

- Introduction
- Original hydrocarbons in place in the reservoir
- Reserves
- Drive mechanisms
- Reservoir study

WELL MONITORING

Duration: 5 days

Objectives

This course is designed to provide trainees with an overview of the well monitoring techniques.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

WELL PLANNING ISSUES
- Geological analysis and evaluation
- Engineering data
- H2S / CO2 / mercaptans
- Casing design criteria
- Casing design
- Cementing program
- Wellhead and BOP
- Directional drilling and well survey program
- Bottom hole assemblies and drillstring design
- Bit selection
- Drilling fluid program
- Rig selection
- Wellbore evaluation
- Well production testing
- Completion objectives and design
- Well intervention / well killing

DOCUMENTS REQUIRED FOR DRILLING A WELL

WELL COSTING
- Reasons For Costing

FACTORS AFFECTING WELL COSTS
DRILLING TIME ESTIMATE
TIME ESTIMATE
DETAILED TIME ESTIMATE

ELEMENTS OF WELL COSTING
- Rig Costs
- Operations costs
- Services
- Total Well Costs

NON PRODUCTIVE TIME (NPT)
- Classification of NPT
- Calculation of NPT

RISK ASSESSMENT IN DRILLING COST CALCULATIONS
- Estimating the P10 value
- Estimation of P50 Value
- Estimation of P90 Value

LEARNING CURVES
- Learning Rate
- Types of Learning Curves

TECHNICAL LIMIT DRILLING
COST REDUCTION

DRILLING CONTRACTING STRATEGIES
- Conventional Contract
- Integrated Services (IS)
- Integrated Project Management (IPM)
- Turn Key Contract

CURRENT AND FUTURE TRENDS IN DRILLING CONTRACTS

WELL CONSTRUCTION: DRILLING ENGINEERING

Duration: 10 days*

Objectives

This 10-day course concerns drilling engineering knowledge. At the end of the session, the trainees acquired the necessary knowledge to prepare a drilling program and completion program.

Who should attend

Drilling superintendents, drilling supervisors, drilling engineers, completion engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

A basic knowledge on drilling technologies and on drilling engineering calculations is required.

Program

WELL PLANNING
- Introduction
- Well planning

PORE PRESSURE & TEMPERATURE
- Introduction
- Pressure and gradient definitions
- Abnormal pore pressure detection
- Temperature prediction

CASING DESIGN and BOP PRESSURE RATING
- Introduction – casing design process
- Data collection
- Formation integrity tests
- Fracture gradient determination
- Casing setting depth and sizes
- Casing design
- Pressure rating of bop equipment

DRILLSTRING DESIGN
- Drill pipe properties – review
- Drill pipe stress and deformations
- Drilling strings calculations

RIG SIZING
- Capacity and power required for the hoisting system
- Rotary table power requirements
- Power required for pumping
- Mud system evaluation

BIT SELECTION
- Introduction & Program
- Drilling bit classification (review)
- Bit selection
- Critical rotary speeds
- Drilling optimization
- Bit hydraulics
- General considerations

FLUID HYDROLICS CONSIDERATIONS
- Hydraulics program preparation
- Design of the hydraulics program

CEMENTING CONSIDERATIONS
- Introduction
- Cement (review)
- Slurry selection
- Cement placement
- Well control
- Job design

The same course can be delivered in 5 days with less detail on each topic, and inversely in 20 days with a closer look at each theme according to client’s needs and requirements.

DRILLING PRACTICES & OPERATIONS

Duration: 10 days

Objectives

The two-week course is designed for engineers and field personnel involved in planning and implementation of drilling programs. The course covers all aspects of drilling technology. Drilling is a complex operation requiring the marriage of different technologies and disciplines. The course provides all the fundamentals necessary to drill a well whether it is a shallow well or a complex, high pressure well.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

A basic knowledge on the drilling technologies is required.

Program

INTRODUCTION TO GEOLOGY

- The earth
- The rocks
- Tectonics
- Stratigraphy
- Petroleum geology
- The reservoir (pore pressure, fluids)
- Oil prospecting

DRILLING BITS

- Bit optimization – drill off test
- Mechanical and hydraulic parameters
- IADC bit wear classifications, study of bit wears

DRILLING JARS

- Types, positioning and calibration

BOREHOLE STABILITY AND COMMON DRILLING PROBLEMS

- Borehole stability
- Stuck pipe
- Lost circulation
- Corrosion

FISHING

- Causes, prevention
- Equipments, tools and procedures
- Typical fishing string
- Free point indicator
- Back-off – side track

BOP AND WELLHEAD TESTS

- BOP and accumulators tests (capacity calculations and tests)
- Wellhead test procedures

CASING AND FORMATION TESTS

- Casing test
- Shoe bond test
- Leak off test

DIRECTIONAL DRILLING AND EQUIPMENTS

- Directional well planning
- Horizontal wells

SAFETY DRILL (KICK DRILL)

EVALUATION AND CORRECTION

RIG SIZING

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with a basic knowledge on the rig sizing.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

INTRODUCTION

CAPACITY AND POWER REQUIRED FOR THE HOSTING SYSTEM

- Hoisting capacity
- Derricks, masts and substructures
- Power required for the hoisting system

ROTARY TABLE POWER REQUIREMENTS

POWER REQUIRED FOR PUMPING

- Review - characteristics of the mud pumps
- Theoretical and practical flow rate
- Discharge pressure
- Power

MUD SYSTEM EVALUATION

- Volume requirements
- Mixing systems
- Solids control needs
- Special requirements as per prognosis

DRILL STRING, BHA & DESIGN

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the drill string, BHA and design.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

THE DRILLING STRING

- Drill String introduction
- Drill Pipe
- Heavy Weight Drill Pipe (HWDP)
- Drill Collar (DC)

BHA STABILIZATION-VERTICAL DRILLING

- Drilling objective in vertical hole
- Deviation phenomena while drilling dipped and interbedded formations
- BHA Selection
- Common Stabilizations
- Conclusion

BHA – AUXILIARY EQUIPMENTS

- Hole Openers
- Shock Subs
- Drilling Jars
- Safety equipment
- Turbines & Downhole Motors

BHA – TOTCO INCLINOMETER

- Description of standard TOTCO inclinometer
- Assembly & operating principle of TOTCO
- Various run-in methods
- Determination of time setting
- Directional double recorder TOTCO

DRILLSTRING DESIGN

- Drill pipe properties- review
- Drill pipe stress & deformation
- Drilling strings calculations

CASING DESING

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the casing design.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

INTRODUCTION – CASING DESIGN PROCESS

DATA COLLECTION

FORMATION INTEGRITY TESTS

FRACTURE GRADIENT DETERMINATION

- Factors Influencing Fracture Gradient
- Theory of wellbore breakage
- FIT Interpretation
- Hubbert and Willis method

CASING SETTING DEPTH AND SIZES

- Casing Profiles
- Casing seat recommendations
- Example: Casing Seat Selection
- Casing and Hole Sizes
- API Casing Classification

CASING DESIGN

- Purpose of Casing
- Factors Influencing Casing Design
- Design Criteria
- Design Criteria

PRESSURE RATING OF BOP EQUIPMENT

BOREHOLE INSTABILITY & COMMONG DRILLING PROBLEMS

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the reasons of the borehole instability and other common drilling problems and the methods to resolve them.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

REASONS OF BOREHOLE INSTABILITY

- Shale instability
- Unconsolidated formation
- Fractured formation
- Mobil formation
- Thermal reaction – evaporate deposits
- Bad hole-cleaning

STUCK PIPE

- Introduction
- Definitions
- Causes

MECHANISMS

- Definitions
- Hole pack-off causes
- Hole bridge causes

SETTLED CUTTINGS

- Settled cuttings, near vertical wellbore (<35°)
- Settled cuttings, high angle wellbore (>35°)
- Indications of settled cuttings
- Preventive actions
- Minimum flow rate (gpm) versus hole size and hole angle
- Maximum rate of penetration (rop) versus hole size and hole angle
- Minimum circulating strokes factor (csf) to clean hole
- High angle hole cleaning guidelines (>35°)

SHALE INSTABILITY

- Chemically stressed
- Mechanically stressed

UNCONSOLIDATED FORMATION

- Indications of unconsolidated formation
- Preventive actions for unconsolidated formation

FRACTURED FORMATION

- Indications of fractured formation
- Preventive actions for fractured formation

CEMENT BLOCKS

SOFT CEMENT

JUNK

DIFFERENTIAL STICKING

- Definition
- Differential sticking conditions

WELLBORE GEOMETRY

LOSS CIRCULATION

- Definitions
- Adverse effects on drilling operations
- Loss circulation mechanism

PRESSURE INDUCED FRACTURE
- Causes of lost circulation
- Warning
- Indications
- First actions (total loss)
- Preventive actions

NATURALLY EXISTING FRACTURE / HIGH PERMEABILITY
- Causes of lost circulation
- Warning
- Indications
- First actions (total loss)
- Preventive actions

LOSS SEVERITY CLASSIFICATIONS
- Seepage loss
- Partial loss
- Total loss

METHODS FOR LOCATING LOSS DEPTH
- Survey methods
- Practical methods
- Considerations for survey methods

RESTORING CIRCULATION
- Guidelines for lost circulation solutions
- Guidelines for successful lost circulation materials (lcm) results
- Seepage loss solutions (< 3 m3/hr)
- Partial loss solutions (> 3 m3/hr)
- Total loss solutions (no return)
- Sealing materials used for lost circulation
- Spotting procedures for lost circulation materials (lcm)
- Spotting procedures for specially pill
- Spotting procedures for gunk pill (cement/bentonite/diesel)
- Spotting procedures for cement

LOSS CIRCULATION PREVENTION GUIDELINES

PRECAUTIONS WHILE DRILLING WITHOUT RETURNS

The same course can be delivered in 10 or 15 days with a closer look at each topic according to client's needs and requirements

FISHING TOOLS & OPERATIONS

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the fishing tools and operations.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

INTRODUCTION
- Definitions
- Causes

PREVENTIONS AND PROCEDURES
- Deficiency of equipments
- Human error or human negligence
- Inadequate program
- Borehole stability
- Fundamental rules

DECISIONS
- Decision parameters
- Decision tree

FISHING TOOLS
- Minimum equipment required on rig site
- Repairing tools
- Impression Block
- Junk Fishing Tools
- Milling Tools
- Washover Tools
- External Catch Tools
- Internal Catch Tools
- Releasing Spear
- Safety Joints
- Jarring System
- Internal Pipe Cutting Tools
- External Pipe Cutting Tools
- Cable Fishing Tools
- Back-Off Tools

FISHING BHA
- BHA for Milling Operations
- BHA for Junk Basket Operations
- BHA for Releasing Spear
- BHA for Internal or External Catch tools
- BHA with jar Intensifier
- BHA for Washover Operations

BHA for Washover Operations

BACK OFF & SIDE TRACK

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the back off and side track.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

INTRODUCTION

STUCK POINT DETERMINATION

- Elongation Measurement or Free-Pointing
- The Free Point Indicator (FPI)

BACK OFF

- Back off with explosive
- Mechanical back off

SIDE TRACK

- Introduction
- Kick off zone selection
- Side track procedures in openhole
  - Setting of cement plug method
  - An alternative to openhole side track: whipstock
- Side track procedures in cased hole
  - Side track through a casing window
  - Side track with the whipstock

DIRECTIONAL DRILLING

Duration: 5 days

Objectives

This 5-days introductory course is designed to provide a comprehensive introduction to directional drilling and horizontal applications. With theory and practice, attendees will learn the benefits of directional and common methods adapted to design, drill, survey and monitor deviated wells.

Who should attend

Drilling, production and operations engineers, drilling supervisors, toolpushers, managers and technical support personnel, and also services companies staff.

Prerequisite

None

Program

INTRODUCTION
- History
- Applications Of Directional Drilling

DIRECTIONAL WELL PLANNING
- Positioning And Coordinate Systems
- Survey Calculation Methods
- Basic Well Planning

SURVEYING
- Magnetic Declination Angle
- Magnetic Interference
- Survey Instruments

DEFLECTION METHODS
- Whipstock
- Jetting
- Down Hole Motor With Bent Sub
- Steerable Positive Displacement Motor
- Toolface Orientation

DOWNHOLE MOTORS
- Positive Displacement Motor
- Steerable Displacement Motor
- Drilling Fluid Requirements With Pdms

DRILL STRING, BHA SELECTION & DESIGN ROTATE/NON ROTATE ASSEMBLIES

HORIZONTAL WELLS

DRILLING BIT TECHNOLOGIES

Duration: 5 days

Objectives

This course module is designed to provide a large overview of the drilling bits and their use. On completion of the course, the attendees will be able to describe the concept of the different drilling bits, to cope with the drilling performance following the bit choice and to describe the bit wear.

Who should attend

Drilling engineers, drilling supervisors, toolpushers, drillers, managers and technical support personnel engaged in drilling and workovers.

Prerequisite

A basic knowledge on the drilling technologies is required.

Program

INTER-ACTION BIT / ROCK

- Characteristics of the rock as material to be destroyed
- Attack of the rock by the bit
- Attack of the bit by the rock
- Bit optimization

ROLLER CONE BITS

- Mode of work
- Description and manufacturing
- Tricone characteristics
  - Cutting structure
  - Bearings and Seals
  - Hydraulic system
- Rock bit metallurgy
- Improvement of rock bit technology
- IADC Rock bit classification

DIAMOND AND FIXED CUTTER BITS

- Introduction – Type of diamonds used
- Mode of work
- Diamond bits
  - Manufacturing
  - Application
  - Design
  - Selection
- Fixed cutter bits
  - Manufacturing
  - Design
- IADC Classification

BIT OPTIMIZATION

- The drilling parameters
  - Mechanical parameters
  - The drill off test
  - Hydraulic parameters
  - Design
- Bits choice
  - Based on the wear analysis
  - The break even method

STUDY OF WEAR ON ROLLER CONE BIT

- Roller cone bit IADC dull grading system
- Dull condition evaluation

STUDY OF WEAR ON FIXED CUTTER BITS

- Fixed cutter bit IADC dull grading system
- Dull condition evaluation

CORING TECHNOLOGIES

Duration: 5 days

Objectives

This course module is designed to provide an overview of the coring equipments and operations. On completion of the course, the attendees will be able to describe the coring process and to choose the equipment accordingly to the operational objectives and constraints.

Who should attend

Drilling engineers, drilling supervisors, toolpushers, drillers, managers and technical support personnel engaged in drilling and workovers.

Prerequisite

None

Program

INTRODUCTION

THE STANDARD CORE BARRELS

CORING SOLUTIONS

- Conventional coring
- Fiberglass inner tubes
- Aluminum inner tubes
- Long barrel coring
- Gel coring
- Unconsolidated formation coring
- Oriented coring
- Horizontal well coring
- Pressure well coring
- Sponge coring (DBS)
- Clean core (DBS)
- CoreGard concept (BHI)

ORIENTED CORING

CORE BITS

CORING PROCEDURES

- The planning phase
- Rig site location
- Picking up the coring equipment
- Running in the hole
- Cutting of the core
- Making a connection
- Operating parameters

OTHER CORING TECHNIQUES

- Sidewall coring
- Wireline coring
- Slimhole coring

CORE ANALYSIS

The same course can be delivered in 10 days with a closer look at each topic according to client’s needs and requirements.

INTRODUCTORY COURSE TO WELL CONTROL

Duration: 5 days

Objectives

To provide the personnel working on the drilling rig with a general training on the well control techniques and equipments.

Who should attend

- Roughnecks
- Floormen
- Roustabouts
- Derrick man
- Fluids Engineer
- Drilling engineers & technicians beginners
- Any personnel working on the drilling rig who need a basic training in well control

Prerequisite

None

Program

- Familiarization with the phenomena of abnormal pressure during operations
- Primary Well Control
- Causes of kicks
- Kicks indications
- Basic calculations
- Normal & abnormal formation pressure
- Hydrostatic exercises
- Hydrostatic pressure losses due to the defective filling of wells
- Pressure systems losses & equivalent circulation density
- Leaks back tests & determination
- Equivalent mud losses
- Maximum mud weight - fracturing pressure
- Introduction to the kill sheet
- Introduction to the well control equipment

WELL CONTROL

Duration: 5 days

Objectives

The course is intended for Drilling technicians, drilling engineers and drilling supervisors to enable them to understand origins, detection and many of the well control issues that can adversely impact their company's drilling operations, particularly possible responses to the phenomena of formation pressure variation during drilling operations. This course provides the participants with theoretical and practical knowhow and techniques to handle well control situations in drilling environments on both surface and subsea locations.

Who should attend

- Assistant Driller
- Driller
- Toolpusher
- Superintendents & Supervisors (Drilling / Fluids & Cement / Production / HSE)
- Technicians & Engineers

Prerequisite

None

Program

INTRODUCTION: DEFINITION OF KICK AND BLOWOUT – TERMINOLOGY

WELL CONTROL NOTIONS

- Basic Concepts
  - Hydrostatic Pressure
  - Formation Pressure
  - Overburden Pressure
  - Fracture Pressure
  - Maximum Pressure allowable
  - Bottom-Hole Pressure
  - Pump Pressure
  - Surge and Swab Pressure
  - Shut-In Drill Pipe Pressure
  - Shut-In Casing Pressure

- Basic Calculations
  - Capacity
  - Displacement
  - Pump outputs
  - Fluid weight up
  - "U" tube / others

KICK INFORMATION

- Causes - Detection during drilling and during tripping
- Importance of the type and volume of effluent

- Driller's procedure for well control
- Safety equipment periodic test and safety drill
-
- KILLSHEET NOTIONS AND USAGE
- Taking readings
- Strokes to bit
- Kill weight mud
- Initial circulating pressure
- Final circulating pressure
- Decline schedule

DRILLER'S METHOD
- Control principle - calculations and kill graph
- Application: case story / equipment incidents / risk of losses above the kick zone

WEIGHT AND WEIGHT METHOD
- Applications

WELL CONTROL EQUIPMENT
- B.O.P
- Diverter
- Closing units and accumulator
- Choke and standpipe manifolds
- Inside B.O.P & safety valve....

EVALUATION AND CORRECTION

Practical exercises on simulator are added if the training is followed by IWCF certification session.

WELL INTERVENTION

Duration: 5 days

Objectives

To provide an understanding of well intervention and pressure control techniques, with the skills to plan, supervise and carry out well intervention:

- ✓ To understand the behavior of a producing well,
- ✓ To learn about the equipment used in wire line, coiled tubing and snubbing,
- ✓ To grasp safety barrier principles,
- ✓ To learn about the equipment, and acquire the methods used to control well pressure,
- ✓ To pass the IWCF "Well Intervention" Test.

Who should attend

Engineers and technicians, who have to plan, supervise or carry out well intervention

Prerequisite

None

Program

BASIC PRINCIPLES AND WELL FUNDAMENTALS

- Physics applied to the well
- Hydrostatic pressures
- Specific gravities
- Densities
- Pressure gradient
- Pore pressure
- Over/underbalance

COMPLETION EQUIPMENT

- Different types of completion
- Specific equipment as
- Packers
- SCSSV
- Side pocket mandrels
- Casing, tubing
- Tubing hanger
- Xmas tree

DIFFERENT TYPES OF INTERVENTION WITH THEIR RESPECTIVE EQUIPMENT

- Wire line intervention
- Slick line
- BOP
- Lubricator
- Stuffing box
- Tool trap
- Braided line, e-line
- Double BOP
- Grease injection system
- Tool trap, tool catcher
- Coiled tubing
- Different types of BOP, strippers
- Problem during the interventions, interpretation and decision
- Snubbing
- BOP, types and stacks
- Specific constraints
- Problem during the interventions, interpretation and decision

PRESSURE CONTROL APPLIED TO COMPLETION AND WELL INTERVENTION

- Barriers, pressure tests
- Well calculation (pressure, volume, kill fluid, pumping time, balancing the pressure at the circulating device…)
- Shut in procedures
- Kill methods (direct or reverse circulation, bull heading, lubricate and bleed…)
- Specific problems linked to producing wells (thief zones, losses, plugging, migration, hydrates…)
- Responsibilities, decision making

DRILLING FLUIDS TECHNOLOGIES

Duration: 10 days*

Objectives

This course module is designed to provide an overview of the drilling fluids techniques and operations.

Who should attend

- Drilling Engineers
- Fluids & Cement Engineers
- Drilling Supervisor
- Fluids & Cement Supervisor
- Toolpushers from drilling and production sectors

Prerequisite

A basic knowledge on drilling fluids technologies is required.

Program

DRILLING FLUIDS FUNCTIONS

- Introduction
- Drilling fluid functions
- Summary

BASIC CHEMISTRY

- Introduction
- Classification of matter
- Atomic structure
- Valence
- Electron shell
- Ionic bonding
- Ionic bonding
- Compounds
- Formula
- Stoichiometry – stoichiometric reactions
- Equivalent weight
- Balancing and equation
- Solubility
- Ph and alkalinity
- Acids, bases and salts
- Concentrations of solutions
- Mixtures – solutions – emulsions – dispersions

COMMON CHEMICAL REACTIONS IN THE MUD CHEMISTRY

- Introduction
- Gyp or anhydrite contamination
- Cement contamination
- Seawater
- Carbon dioxide gas contamination
- Carbonate and bicarbonate contamination
- Hydrogen sulfide (h2s) contamination
- Removal of oxygen with oxygen scavenger
- Acid treatments
- Phosphates
- Effect of lignite on calcium

CONTAMINATION AND TREATMENT

- Introduction
- Anhydrite or gypsum contamination
- Cement contamination
- Carbonate contamination
- Salt contamination
- Salt water flow
- Hydrogen sulfide (h2s) contamination
- Quick reference for recognizing and treating contaminants

DRILLING FLUIDS - CALCULATIONS
- Introduction
- Us oilfield and metric units
- General wellbore calculations
- Pumps output
- Annular velocity
- Circulation time
- Hydrostatic pressure
- Example calculations
- Weight increase using mud materials
- Weight reduction using water or oil
- Volume increase using mud materials
- Mixing liquids of different densities

RHEOLOGY
- Introduction
- Rheology
- Flow regimes

CLAY CHEMISTRY
- Introduction
- Type of clay
- Caution exchange capacity (cec)
- Composition of clay-water mud
- Principles of chemical treatment

TESTING Equipments and PROCEDURES
- Introduction
- Density of fluid (or mud weight)
- Viscosity
- Filtration
- Sand content
- Liquid and solid content
- Hydrogen ion concentration (ph)
- Chemical analysis of water drilling fluids

NON INHIBITIVE WATER BASED MUD SYSTEMS
- Introduction
- Non-inhibitive fluid

INHIBITIVE WATER BASED MUD SYSTEMS
- Introduction
- Calcium-based muds
- Lime muds
- Gyp muds
- Salt based muds
- Potassium-based muds
- Polymer fluids

OIL BASED MUDS
- Introduction
- Oil mud applications
- Disadvantages of oil mud
- Oil mud products description
- Types of base oils used
- Oil mud formulations
- Mixing procedures
- Oil mud properties
- Trouble shooting oil muds
- Oil mud calculations
- Gas solubility in oil mud

SOLIDS CONTROL
- Introduction
- Characteristics of solids
- Methods for solids controls
- Principles of mechanical solids separation
- Sequence of solids control devices
- Solids removal devices
- Dewatering and zero-discharge solids control

DRILLI-IN FLUIDS
- Introduction
- Formation damage mechanisms
- Drill-in fluids types and applications

One week laboratory can be added to the course if the training is done on field or base camp having a laboratory.

DRILLING FLUIDS & SOLIDS CONTROL

Duration: 5 days

Objectives

This course module is designed to provide an overview of the drilling fluids and the solids control.

Who should attend

- Drilling Engineers
- Fluids & Cement Engineers
- Drilling Supervisor
- Fluids & Cement Supervisor
- Toolpushers from drilling and production sectors

Prerequisite

None

Program

DRILLING FLUIDS AND HYDRAULICS

DRILLING FLUIDS
- Make-up of a drilling fluid
- Normal drilling fluids
- Special drilling fluids
- Lime base muds
- Lime-treated muds
- Emulsion muds - oil in water
- Inhibited muds
- Gypsum base muds
- Oil based muds
- Inverted emulsions
- Salt water muds
- Silicate muds
- Low solids muds
- Drilling fluid classification systems
- Drilling fluid additives

MATERIAL BALANCE EQUATIONS

OIL-BASED DRILLING FLUIDS
- Electrical Stability
- Oil: Water Ratio
- Aniline Point

DRILLING FLUID ECONOMICS

DRILLING FLUID PROPERTIES

PRESSURE
- Hydrostatic pressure
- Hydraulic pressure
- Imposed pressure
- Pressure imposed by the pump
- Pressure imposed by the formation
- Pascal's law

DRILLING FLUID REPORTING PARAMETERS
- Density
- Plastic viscosity
- Yield point
- Gel strength
- Ph
- Filtrate/water loss
- Alkalinity, mud pm alkalinity, filtrate
- Salt/chlorides
- Calcium
- Sand content
- Solids content
- Funnel viscosity

HYDRAULICS
- Bingham plastic model
- Power law model

HYDRAULIC CALCULATIONS
- Surface pressure losses
- Pressure loss in the drillstring
- Drillstring pressure losses
- Annular pressure losses
- Reynolds number and critical velocity

CUTTINGS TRANSPORT
- Cuttings slip velocity

SWAB AND SURGE PRESSURE
- Swab and surge analysis report

MUD HYDRAULICS ANALYSIS REPORT

SOLIDS CONTROL INTRODUCTION

CHARACTERISTICS OF SOLIDS
- Types of solids
- Classification of particles sizes
- Shape of solids
- Concentration and size distribution of solids

METHODS FOR SOLIDS CONTROLS
- Dilution method
- Gravity settling method
- Mechanical separation method
- Chemical-mechanical separation method

PRINCIPLES OF MECHANICAL SOLIDS SEPARATION
- Processing in sequence
- Total flow processing
- No bypassing

SEQUENCE OF SOLIDS CONTROL DEVICES
- Solid removal region
- Addition region
- Mud check (suction) region

SOLIDS REMOVAL DEVICES
- Shale shakers
- Hydrocyclones
  - Desanders
  - Desilters
  - Mud Cleaners
- Centrifuges

DEWATERING AND ZERO-DISCHARGE SOLIDS CONTROL

CEMENTING TECHNOLOGIES
BASIC
Duration: 5 days

Objectives

This 5-days course is designed to provide a basic knowledge on the cementing technologies. This session will cover cement standards, cement materials, primary cementing, plug cementing, squeeze cementing, cement evaluation, and good cementing practices.

Who should attend

- Drilling Engineers
- Fluids & Cement Engineers
- Drilling Supervisor
- Fluids & Cement Supervisor
- Toolpushers from drilling and production sectors

Prerequisite

None

Program

CEMENTING-GENERAL
- Introduction
- Casings
    - Types of casing strings
- Cementing
    - Cementing objectives
    - Cement slurry volume
    - Displacement volume
    - Cements usage
    - Cementing job process
    - Cementing equipment for single stage column
    - Cementing for multiple stage column

CEMENT SLURRY PROPERTIES
- Introduction
- Cement slurry properties
    - Slurry properties as defined in laboratory testing

LABORATORY TESTING

- Introduction
- Slurry preparation
- Slurry tests
  - Density measurement
  - Fluid-loss testing
  - Rheology testing
  - Thickening-time tests
  - Compressive strength testing
  - Transition time testing
  - Slurry contamination testing
  - Free fluid testing
  - Slurry stability/settling test
- Other tests

CEMENTING EQUIPMENT

- Introduction
- Bulk cement handling equipment
- Cement mixing equipment
- Auxiliary equipment

MUD REMOVAL-SLURRY DISPLACEMENT

- Introduction
  - Importance of mud displacement
  - Mud-removal process
  - Factors affecting mud-displacement efficiency
- Well preparation
  - Mud conditioning before running casing
  - Running casing
  - Conditioning the drilling fluid
- Displacement techniques
  - Problem analysis
  - Turbulent-flow technique
  - Effective laminar-flow technique
- Displacement fluids or preflushes
  - Purpose of chemical washes and spacers
  - Chemical washes
  - Spacers
  - Preflush volumes for turbulent-flow displacement
  - Preflush volumes for effective laminar-flow displacement

CEMENTING TECHNOLOGIES ADVANCED

Duration: 10 days*

Objectives

This 10-days course is designed to develop and deepen the basic knowledge on cementing. This session will cover cement standards, cement materials, primary cementing, plug cementing, squeeze cementing, cement evaluation and good cementing practices

Who should attend

- Drilling Engineers
- Fluids & Cement Engineers
- Drilling Supervisor
- Fluids & Cement Supervisor
- Toolpushers from drilling and production sectors

Prerequisite

A basic knowledge on the cementing technologies is required.

Program

- Primary cementing & casing hardware
- Cement manufacturing and additives
- Cement slurry properties
- Laboratory testing
- Cementing equipments
- Mud removal – Slurry displacement
- Gas migration
- Foam cement
- Special cements
- Well analysis and slurry selection
- Horizontal well cementing
- Cementing failure – Causes and Solutions
- Remedial cementing
- Introduction to cementing evaluation

One week laboratory can be added to the course if the training is done on field or base camp having a cement laboratory.

DRILLING FLUIDS & CEMENT TECHNOLOGIES & PRACTICES

Duration: 17 weeks

Objectives

The purpose of this training course is to train future drilling fluid supervisors or anyone else responsible for Fluid engineering projects in the company.

At the end of the training, the trainees acquired the necessary knowledge to analyze a drilling fluids program (mud and cement). They are able to prepare and to follow the operations while drilling and to converse efficiently with the specialists.

Who should attend

- Senior technicians
- Mud engineers
- Any other personnel involved in operations

Prerequisite

- Basic knowledge of physics and chemistry,
- Training as a Derrickman and Assistant Driller in a contractor drilling company
- Drilling knowledge: level Assistant driller of the "Drilling supervisor training program"

Program

If the pre-requisites are respected, the training start with the module "Basic Fluids & Cements" courses named "BFC". If the trainees have no experience in drilling, they must follow the module "Basic Drilling Training (BDT)" before to start "BFC".

I. BASIC DRILLING TRAINING PROGRAM (3 weeks)

INTRODUCTION TO PETROLEUM GEOLOGY (5 days)

- Introduction - The Earth
- The Rocks
- Tectonic
- Stratigraphy
- Reservoir characterization
- Exploration : geology, geophysics
- Cartography (theory and practice on)
- Rig site geology

INTRODUCTION TO DRILLING (10 days)

- Drilling rigs
- Drilling rig functions
- Drill string and equipments
- Architecture of a well
- Casing and equipment
- Well head
- Bop and Auxiliary equipment
- Drilling bit technology
- Coring technology and core bit
- Directional drilling
- Well control
- DST (introduction)
- Completion (introduction)
- Safety on rig site
- Knowledge Evaluation

II. BASIC FLUIDS & CEMENTS (BFC) (14 weeks)

BASIC DRILLING FLUIDS (8 weeks)

- Drilling Fluid Functions, types and properties of the drilling fluids.
- Basic Chemistry

- Chemical dosages
- Common Chemical reaction in mud chemistry
- Use of the control material
- Basic Engineering calculations
- Rheology
- Hydraulic
- Clays chemistry, structures and properties
- Shale caused problems
- Solid content
- Calculations on LGS/HGS
- Filtration, Darcy's law
- Water-based mud systems
- Testing water based mud system
- Contamination
- Polymer mud system
- Gypsum mud system
- Saturated salt water mud.
- KCL, PHPA mud system
- Borehole Stability
- Oil based mud system
- Solids removal - Solids analysis
- Drill-in Fluids, damaging fluids
- Service Companies presentation: Systems & Produces
- Elaboration of a drilling fluid program
- Drilling fluid reports and well reports

WORKOVER/COMPLETION FLUIDS (5 days)

- Completion/Workover Fluid Functions, types and properties.
- Characteristics and usage limits (engineering).
- Application and fluid design.
- Formation damage

BASIC CEMENT (5 weeks)

Theoretical Training (20 days)

- Primary cementing
- Casing hardware
- Cement manufacturing and cement chemistry Cement laboratory introduction
- Properties and characteristics of slurries
- Cementing additives
- Calculation on slurries: definition of the different terms
- Rheology: models, calculations, application to slurry rules displacement
- Spacers
- Mechanism of fluids displacement: mud/spacer/slurry
- Application to Primary cementation
- Cementing equipments : cementing unit, batch mixer, cementing head, visit on yard
- Primary cementing: calculations
- Liner cementing: method and calculations
- Special systems: Saturated salty slurries, Thixotropic, Lightweight slurry system
- Introduction to horizontal well cementing
- Gas migration
- Criteria for successful cementing
- Reasons of failures of the cementing operations and remedies
- Plug cementing and placement
- Remedial cementing
- Cementing job evaluation: during the job, after the job
- Cementing job evaluation: during the job, after the job
- Service Companies presentation: Systems & Products

Laboratory (5 days)

- Laboratory facilities and equipments
- Procedures & Normalization of API tests
- Realization and mixing of a cement slurry
- Density design and Rheological characteristic
- Filtration test
- Thickening time test - Compressive strength test spacer scavenging capabilities determination
- Mixing spacer : rheology and compatibilities
- Laboratory cement report
- Application Computer Aid

****There are two possibilities for on-the-job training:***

- ***Organized by the client without Drilnet***
- ***Organized by the client with the "On job training" process from Drilnet***

WELL TESTING

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the well testing allowing the production optimization.

The aim of the course is to provide trainees with sufficient knowledge to understand the importance of the planning and programming stage in defining the requirements of the well test. Upon completion of this course, the participants will have a better understanding of the factors in planning and preparing a successful well program.

Who should attend

- Production Supervisor
- Production Engineer
- Any other personnel involved in E&P operations as a coordinator

Prerequisite

None

Program

- Introduction
- Aims And Objectives
- Introduction To Well Testing
- Types Of Well Tests
- Formation Damage & Skin Effect
- Reservoir Fluid Sampling
- Surface Sampling
- Safety Planning
- Responsibilities
- Defined Responsibilities For The Well Test Program
- The Well Test Design
- Operations Design
- Offsite Checklists
- Onsite Checklists
- Examples Of Well Test Programs/Procedures
- End Of Well Test Operations

ARTIFICIAL LIFT:
GAS LIFT
Duration: 5 days

Objectives

The aim of this course is to explain how a gas lifted well is working and how to design it.

This course covers all the aspects of a gas lift installation from the reservoir aspect up to the surface installation and trouble shooting.

Who should attend

This course is intended primarily for reservoir engineers and petroleum engineers beginners or experienced.

Prerequisite

None

Program

- Flowing gradients -Tubing performances curves
- Inflow performances
- Well representation
- Reservoir performances
- Nodal analysis
- Outflow performances
- Vertical pressure gradients curves for two-phase flow
- Introducing gas lift
- Principles, main parameters
- Characteristics, advantages and limitations.
- Gas lift downhole equipment
  - Valves- type and functions
  - Casing operated valves, butting operated valves
  - Miscellaneous valves
  - Valve calibration at workshop
  - Design of gas lift installation
  - Positioning side pocket mandrels
  - Valve selection
  - Gas lift design
  - Completion designs
- Special gas lift system
  - Close-circuit gas lift.
  - Intermittent gas lift.
  - High-pressure gas lift, high IP,
  - Dual gas lift
- Analyzing and monitoring a gas lift operation
  - Surface equipment
  - Start up procedures and recommendations.
  - Trouble shooting

WATER INJECTION OPERATIONS

Duration: 1 day

Objectives

This 1-day course is designed to provide oil & gas technicians with knowledge and understanding of water injection operations.

Who should attend

Oil & Gas Technicians

Prerequisite

None

Program

- Principles of water injection
- Principles of deaeration
- Principles of oxygen scavenging
- Deaeration and filtration plant
- Types of water injection filtration plant available
- Water injection wells, downhole completions and reservoir formation
- Water injection operations and monitoring
- Hazards associated with water injection operations

INTRODUCTION TO HYDRAULIC FRACTURING

Duration: 2 days

Objectives

The course is designed to give a broad overview of how fracturing works, the terminology used, and the processes that are incorporated into hydraulic fracturing. The attendees will be presented an in-detail tour of the various processes, history, requirements, and issues surrounding hydraulic fracturing. On the completion of the course the attendees will be able to identify the processes of hydraulic fracturing and articulate the various challenges and issues associated with this drilling technique.

Who should attend

- Oil and gas industry executives, managers, and directors
- Project managers and directors
- Operational directors and managers
- Environmental, health, and safety managers and directors
- Regulators from local, state, and federal levels of government
- Legal personnel involved with the oil and gas industry
- Financial institutions involved in oil and gas activities
- Engineers in energy extraction and production
- Governmental and community affairs executives, managers, and directors
- Individuals new to the oil and gas industry

Program

PERSPECTIVE

HYDRAULIC FRACTURING IN OIL & GAS ACTIVITIES

GEOLOGY

- Classification of rocks
- Formation
- Porosity
- Permeability
- Geological mapping
- Creation of oil and gas
- Brief history of oil and gas production

DRILLING

- What it takes to drill (people, equipment, money, time, etc.)
- History of drilling: from water to oil and gas
- Differences in drilling techniques
- Vertical and horizontal
- Casing in drilling
- Problems with drilling
- Well completionFRACTURING
- History of hydraulic fracturing
- Action of fracturing
- Frac design
- Shale plays = differences in fracturing
- Onshore vs. offshore fracturing
- Post-treatment reports
- Well bore diameter
- Fracturing horizontal wells

TRUTHS AND MYTHS

- Groundwater contamination
- Water used for fracturing
- Fracturing causing earthquakes
- Emissions stemming from fracturing
- EPA's Pavilion, Wyoming, report
- Current issues facing fracturing

FUTURE OF HYDRAULIC FRACTURING

- Regulations and transparency
- "Super fracturing": How deep? How far?
- Technology development

HP/HT WELL DRILLING

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the drilling of high pressure and high temperature wells.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

DEFINITION

RIG SELECTION

MUD SELECTION

- Comparison between Water Based and SBM muds
- Well control issues
- FIT considerations
- Thermal effects on fracture gradient
- Pressure to break gel
- Pipe speed
- Breathing and/or Ballooning
- Barite sagging in HPHT Wells

CASING DESIGN

- Example casing design for HPHT Wells

TEMPERATURE EFFECTS ON CASING STRENGTH

- Example Reduced Burst Strength Due to High Temperature

DRILLING STRING CONSIDERATIONS

- Drilling components
- Measurement tools

WELL TESTING CONSIDERATIONS

- Mud as a test fluid
- Kill weight brine as a test fluid
- Sea water as a test fluid
- Consequences for testing with sub kill or kill weight fluid
- Typical test string design

CEMENTING CONSIDERATIONS

TRAPPED ANNULUS PRESSURE

- Cause
- Mathematical analysis
- Differential pressures

PORE PRESSURE DETERMINATION

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors and drilling engineers with an advanced knowledge on the pore pressure determination.

Who should attend

- Drilling Supervisors
- Drilling Engineers

Prerequisite

A basic knowledge on the pore pressure determination is required to follow this course.

Program

DEFINITIONS

HYDROSTATIC PRESSURE
- Overburden Pressure
- Matrix Stress

PORE PRESSURE
- Normal Pore Pressure
- Abnormal Pore Pressure
- Subnormal Pore Pressure

CAUSES OF ABNORMAL PORE PRESSURE
- Depositional Effects
- Diagenetic Processes
- Tectonic Effects
- Structural Causes
- Reservoir Structure
- Thermodynamic Processes
- Abnormal Pore Pressure Evaluation

MUD LOGGING METHODS
- Rate of Penetration (ROP)
- Corrected D Exponent
- Pore Pressure Calculation From DC Exponent Data
- Limitations of the D Exponent
- Drag, Torque and Fill
- Gas Levels
- Temperature Data
- Flowline Temperature
- Cuttings Parameters

LOGS
- Gamma Ray
- Resistivity
- Sonic Logs
- Theory Of Sonic Logging
- Resistivity Logs
- Formation Density Logs

DAILY MONITORING OF WELLS

Duration: 5 days

Objectives

This 5-day basic course is designed to provide production engineers and technicians with knowledge on the daily monitoring of wells.

Who should attend

Production engineers & technicians from petroleum and services companies

Prerequisite

None

Program

PRESENTATION: "FROM RESERVOIR TO SEPARATOR"

BASIC KNOWLEDGE
- The effluent
- The reservoir
- The effluent and the reservoir

TUBING ARCHITECTURE
- Types of completion
- Discussion of a typical completion
- Pressure drops
- Hydrostatic pressure loss
- Effects of friction
- Pressure loss in the installations
- Representation of pressure loss

ACTIVATION
- Selection of an activation means
- Gas lift activation
- Reciprocating rod pumping
- Electrical submersible pumping
- Progressing cavity pumping
- Hydraulic reciprocating pumping
- Hydraulic jet pumping

WIRE-LINE AND MAINTENANCE OPERATIONS
- Plugs, SCSSV, injection valves
- Bottom hole measurements, simultaneous surface measurements
- Other wire-line operations
- Coiled tubing, Swabbing
- Reservoir treatment

MEASUREMENTS AND RECORDINGS
- Definitions
- Location
- Procedures
- What for?
- Which record types?

THE WELL AND ITS DRAWBACKS
- Deposits
- Hydrates
- Corrosion

THE WELL AND ITS CONTROL
- Wells monitoring
- Wells kick off
- The collapse
- The trouble shooting

MANAGED PRESSURE DRILLING (MPD)

Duration: 5 days

Objectives

This 5-day course is designed to provide drilling supervisors and drilling engineers with an advanced knowledge on the managed pressure drilling. The purpose of this training is to provide a comprehensive and practical knowledge of non-conventional techniques used in advanced drilling and completion processes to enhance drilling performance and oil recovery

Who should attend

- Drilling Engineers
- Mud Engineers
- Superintendents
- Supervisors
- All professionals involved in well planning and operations

Prerequisite

A basic knowledge on drilling and well control is required to follow this course.

Program

BASIC PRINCIPLES OF MANAGED PRESSURE DRILLING

- History, objectives and definitions
- Occurrence and implications of narrow pore and fracture pressures windows on well design and well control
- Dynamic factors affecting bottom hole pressure
- Mathematics and examples

MUD CAP DRILLING

- History of mud cap drilling
- Pressurized and floating mud cap
- Mud cap operation

MANAGED PRESSURE DRILLING EQUIPMENT

- Rotating control devices
- Chokes
- Drill pipe non return valves and down-hole annular valves
- ECD reduction tools
- Coriolis flow-meter, friction pump

MANAGED PRESSURE DRILLING USING PRESSURE AS PRIMARY CONTROL

- Introduction, open and closed back pressure systems
- Automated back pressure system technology
- Continuous circulating system technology

MANAGED PRESSURE DRILLING USING FLOW AS PRIMARY CONTROL

- Process description
- Equipment and technology
- Applications

CONCLUSION

- Advantages of managed pressure drilling
- Potential and limitations
- Typical applications

UNDER BALANCED DRILLING

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the under balanced drilling.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

INTRODUCTION TO UBD
- Why the UBD?
- Well Candidate for UBD, the criteria
- Misunderstandings on UBD

UBD FLUID TYPES
- Liquid drilling Fluids
- Gaseous drilling Fluids
- Mist Drilling
- Foam Drilling
- Aerated Fluid Drilling

UBD TECHNIQUES
- Gas Injection through Standpipe
- Gas Injection through Parasitic String
- Gas Injection through Parasitic Liner

SYSTEM REQUIREMENTS
- Surface equipment
- Downhole equipment
- Coiled Tubing drilling

DRILLING ENGINEERING
- Fluid mechanics
- Torque & Drag
- Hole Stability

SPECIAL CONSIDERATIONS
- Safety
- Regulation Requirements
- Environmental issues
- Corrosion of Drillstring
- Erosion of Tubulars
- Downhole Fire
- Vibrations

COIL TUBING TECHNOLOGIES

Duration: 5 days

Objectives

This 5-days course is designed to provide a comprehensive introduction to coil tubing equipments and operations.

Who should attend

Drilling, production and operations engineers, drilling and production supervisors, toolpushers, managers and technical support personnel engaged in drilling, completions and workover.

Prerequisite

Drilling technologies knowledge's are necessary to better understand the program content.

Program

- CT Unit types
- CT Components
- CT Auxiliary Equipments
- CT Tools
- Nitrogen Equipments
- CT Application
  - Gas Lift, Fill Removal, Jetting, Stimulation, etc.
  - Milling, Drilling, Cementing, Fishing, Sand Control, etc.
- N2 Calculations

CASING WHILE DRILLING
Duration: 2 days

Objectives

This 2-days course is designed to provide trainees with an overview of the casing while drilling techniques.

Who should attend

Drilling supervisors, drilling engineers and operations engineers of petroleum companies, drilling contractors and services companies

Prerequisite

None

Program

- General view
- Advantages and Disadvantages
- Types of CwD, Scenarios for CwD applications
- Operational aspects of CwD
- Rig and downhole tool equipment design and applications
- Hydraulics
- Drilling fluids for CwD
- Well control while drilling with casing
- Surface-hole casing while drilling
- Drilling efficiency optimization
- New technology development and application
- Successful implementation of the technology around the world
- Drilling feasibility analysis
- HPHT, deepwater
- Review of benefits, challenges and limitations
- Cost comparisons and risk management

WELL COMPLETION

Duration: 5 days

Objectives

This course module is designed to provide an overview of the completion design process, and a fundamental explanation of the well and service equipment and operations. On completion of the course, the attendees will be able to describe a completion process, to cope with the completion operations and with the use of selected equipments.

Who should attend

Drilling, production and operations engineers, drilling and production supervisors, toolpushers, managers and technical support personnel engaged in drilling, completions, and workovers.

Prerequisite

The course requires a good understanding of basic well construction and operations.

Program

INTRODUCTION TO THE TOPIC AND PROGRAM

COMPLETION OBJECTIVE AND FUNCTIONS

COMPLETION DESIGN
- Reservoir
- Mechanical considerations
- Safety

COMPLETION CONFIGURATION
- Single completion method and scheme
- Single selective characteristics
- Intelligent completions
- Dual completion
- Gravel pack completion

TUBING
- Classification
- API's nomenclature
- Tubing thread and size
- Tubing API

PACKERS
- Packer functions
- Main elements of the packer
- Different type of packer
- Tubing-packer connection

SAFETY VALVE
- General
- Surface controlled safety valve
- Control lines

AUXILIARY EQUIPMENT
- Landing nipples - Circulating valve
- Flow coupling

COMPLETION FLUID
- Definition - Characteristics
- Well gradient - Type of completion fluid

CASING PERFORATION
- Objective
- shaped charge perforating
- Casing' s perforating mechanism
- Charge performance

WELLHEAD AND CHRISTMAS TREE

GATE VALVE

WELL UNLOADING (DISPLACEMENT FLUID AND DISPLACEMENT SYSTEM)

WELL TESTING - DST

Duration: 5 days

Objectives

This course module is designed to provide an overview of the well test process during drilling or after completion, and a fundamental explanation of the formation testing technologies, service providers, tool/gauge types, measurement principles. On completion of the course, the attendees will be able to describe a well test process, to cope with the well testing operations and with the use of selected equipments.

Who should attend

Drilling, production and operations engineers, drilling and production supervisors, toolpushers, managers and technical support personnel engaged in drilling, completions, and workovers.

Prerequisite

Drilling technologies knowledge's are necessary to better understand the program content.

Program

INTRODUCTION TO WELL TESTING

TYPES OF WELL TESTS

FORMATION DAMAGE & SKIN EFFECT

RESERVOIR FLUID SAMPLING

- Definition , Importance of reservoir fluid sampling
- Sampling procedures design

SURFACE SAMPLING

- Introduction, Well conditioning
- Gas surface sampling methods
- Oil surface sampling methods
- Special surface sampling cases
- Wellhead sampling, Safety

SAFETY PLANNING

RESPONSIBILITIES FOR THE WELL TEST PROCESS

WELL TEST DESIGN

OPERATION DESIGN

- General process
- Electronic gauge guidelines & design
- Data acquisition
- Sampling program design

OFF-SITE CHECKLIST

- Electronic gauges checklist
- Surface test equipment checklist
- Sampling checklist

ON-SITE CHECKLIST

- Well-site preparation
- General preparation checklist
- Electronic gauges checklist
- Sampling checklist

EXAMPLE OF WELL TEST PROGRAM AND PROCEDURE

GLOSSARY

DST PRINCIPLE

- Historic of DST
- DST environment and operating conditions, DST advantages

DST BASIC CONCEPT

- Downhole pressures
- Operation sequences
- DST string and components

EXAMPLE OF DST APPLICATION (PROGRAM AND OPERATION)

WIRELINE LOGGING & SLICKLINE OPERATIONS

Duration: 5 days

Objectives

This 5-day basic course is designed to provide drilling supervisors, drilling engineers and operations engineering staff with knowledge on the wireline logging and the slickline operations.

Who should attend

Drilling, production and operations engineers, drilling and production supervisors, toolpushers, managers and technical support personnel engaged in drilling, completions and workover.

Prerequisite

None

Program

WIRELINE LOGGING

- General guidelines
- Preparations
- Quality control
- Witnessing wireline logging runs
- Handling explosives
- Handling radioactive sources

WRELINE LOGGING APPLICATIONS

CCL-CBL-VDL-USIT

- Calipers
- Gamma-Ray (Gr)
- Resistivity
- Temperature & pressure
- Sonic
- Density
- Neutron
- Spontaneous potential

OTHER WL OPERATIONS

- Wireline set inflatable bridge plug
- Wireline set packers
- Logging tool fishing

SLICK LINE OPERATIONS

- Introduction
- Slickline equipment
- Slickline applications
- Slickline issues

WELL COMPLETION ENGINEERING

Duration: 10 days

Objectives

This course module is designed to provide an overview of completion techniques and operations. On completion of the course, the attendees will be able to define the material needed to equip an oil/gas well, to understand a completion program and to follow the rig operations.

Who should attend

Drilling, production and operations engineers, drilling and production supervisors, toolpushers, managers and technical support personnel engaged in drilling, completions, and workovers.

Prerequisite

The course requires a good understanding of basic well construction and operations.

Program

COMPLETION DESIGN ASSUMPTIONS AND CONSIDERATIONS

- Planning
- Concept
- Type and Classification
- Wellbore and reservoir interface
- Completion configuration
- Equipments

FROM PRE-FEASIBILITY TO INSTALLATION

- Pre-feasibility
- Feasibility, Detail and Dedicated study
- Special project – Gas storage
- Nodal analysis a few more details
- Tubing design

WELL PREPARATION AND COMPLETION GENERAL PROCEDURE

- Well control equipment overview
- Barriers concept and configuration
- Well preparation
- General procedures

FORMATION DAMAGE - COMPLETION FLUIDS

- Formation damage, mechanism and classification
- Completion fluids
- Reason to prevent damage
- Brines - Fluid displacement
- Fluids properties & selection
- Brine selection versus type of operation
- Packer fluid definition and function
- Additives type and purposes
- Stimulation
- Potential safety hazard in acidizing
- Acids used in well stimulation
- Carbonate acidizing
- Acidizing techniques for carbonate formation
- Sandstone acidizing

PERFORATION

- Process
- Charge case functions and characteristics
- Perforating mechanism
- Gun performance data
- Type of guns and perforation methods
- Perforating conditions
- Gun selection and perforating techniques

TUBULAR GOODS

- Manufacturing process
- Nomenclature
- Type of connection and selection criteria
- Tubing specifications and definition
- Tubular damage
- Tubing handling, transportation and storage

- Ancillary equipment for storing and running tubular
- Tubular expandable technology

PRODUCTION PACKERS AND ACCESSORIES

SUBSURFACE SAFETY VALVES
- Function, Types and Categories
- Installations
- Controlled safety valve and SSD
- Lubricator valve

COMPLETION EQUIPMENT ACCESSORIES
- Communication devices
- Landing nipple
- Flow control equipment
- Additional auxiliary completion tools
- Down hole pressure and temperature transmitter

TUBING MOVEMENT AND PACKER FORCES
- Mechanical properties and failure of the material
- Design factor overview
- Factors governing tubing movement
- Tubing stress analysis outline
- Tubing to packer connection
- Load cases for production and injection wells

CORROSION & EQUIPMENT SELECTION
- Corrosion causes and effects
- Metallurgy typology & definition
- Non metallic sealing material classification
- Elastomer types
- Seal material selection criteria
- Effects of down hole environment
- Failure mechanism
- Plastic material

WELL HEAD EQUIPMENT AND CHRISTMAS TREE

RESERVOIR

Duration: 5 days

Objectives

This 5-day basic course is designed to provide reservoir engineers and other staff involved in reservoir operations with knowledge on the characteristics of the reservoir and reservoir fluids, reservoir classification and behavior, and also production tests.

Who should attend

Petroleum & reservoir engineers, geologists, production engineers

Prerequisite

None

Program

GENERAL CHARACTERISTICS OF A HYDROCARBONS RESERVOIR
- Formation of oceans
- Formation of mountain chains

CHARACTERISTICS OF RESERVOIR
- General remarks
- Porosity
- Permeability
- Wettability
- Capillary pressure
- Distribution of fluid

CHARACTERISTICS OF THE RESERVOIR FLUIDS
- Dry gas
  - Composition
  - Specific Gravity
  - Compressibility factor
- Gas condensate (CO_2)
- Oil
  - Composition
  - Specific gravity
  - Viscosity
  - Substances Present In the Crude
  - Gas Oil Ratio
- Water
  - Salt Content and salinity
  - Water oil ratio

RESERVOIR CLASSIFICATION
- Rocks
- Sedimentary rocks
- Igneous rocks
- Aquifer

RECOVERY
- General remarks
- Drive mechanism
  - Depletion
  - Dissolved gas drive
  - Gravity Segregation drive
  - Gas Cap Drive
  - Water drive
  - General conclusions
- Primary and enhanced recovery
  - Water Injection
  - Gas injection

RESERVOIR BEHAVIOUR
- Dynamic condition
  - Flow type (Single phase and multiphase flows)
  - Drainage Area - Drainage Radius
  - Losses of pressure
  - Volumes
  - Pressure
  - Temperature
- Static conditions
- Routine test and periodic test

PRODUCTION TEST
- General remarks
- Type of test
- Use of data
  - Problems of a disorderly production
  - Rate limitation

INTRODUCTORY COURSE TO WELL CONTROL (L2 IWCF)

Duration: 5 days

Objectives

Theoretical & practical course for surface installations at introductory level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IWCF testing.

Who should attend

Any personnel working on the rig who needs an introductory training in well control.

Prerequisite

None

Program

At the end of the training the delegates will be able to understand the followings:

SURFACE PRINCIPLES & PROCEDURES

- Overview
- Introduction to Well Control
- Barrier Concept
- Risk Management
- Causes of kicks
- Kill Warning Signs and Indicators
- Circulating Systems
- Fracture Pressure and Maximum Surface pressure
- Influx Characteristics and Behavior
- Shut In Procedures
- Well Control Methods

SURFACE EQUIPMENT

- Blowout Preventers
- Associated Well Control Equipment
- Choke Manifold and Chokes
- Auxiliary Equipment
- Barriers
- Testing
- BOP Control Systems

WELL CONTROL
(L3 IWCF)
Duration: 5 days

Objectives

Theoretical & practical course for surface installations at the driller level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IWCF testing.

Who should attend

Anyone involved in drilling and/or well control operations in a non-supervisory position: all positions from floorman to driller inclusive.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L2 IWCF, Introductory Course to Well Control, to access to this training. Dispensation can be given to candidates who have undergone industry accepted vocational training.

Program

At the end of the training the delegates will be able to understand the followings:

SURFACE PRINCIPLES & PROCEDURES

- Overview
- Introduction to Well Control
- Barrier Concept
- Risk Management
- Causes of kicks
- Kill Warning Signs and Indicators
- Circulating Systems
- Fracture Pressure and Maximum Surface pressure
- Influx Characteristics and Behavior
- Shut In Procedures
- Well Control Methods
- Well Control during Casing and Cementing Operations.
- Well Control Management
- Contingency Planning

SURFACE EQUIPMENT

- Blowout Preventers
- Associated Well Control Equipment
- Choke Manifold and Chokes
- Auxiliary Equipment
- Barriers
- Testing
- BOP Control Systems

WELL CONTROL
(L4 IWCF)
Duration: 5 days

Objectives

Theoretical & practical course for surface installations at supervisory level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IWCF testing.

Who should attend

Anyone involved in drilling and/or well control operations: all positions above driller.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L3 IWCF, Well Control, to access to this training. Dispensation can be given to candidates who have successfully completed an appropriate in-house graduate training program.

Program

SURFACE PRINCIPLES & PROCEDURES

- Overview
- Introduction to Well Control
- Barrier Concept
- Risk Management
- Causes of kicks
- Kill Warning Signs and Indicators
- Circulating Systems
- Fracture Pressure and Maximum Surface pressure
- Influx Characteristics and Behavior
- Shut In Procedures
- Well Control Methods
- Well Control during Casing and Cementing Operations.
- Well Control Management
- Contingency Planning

SURFACE EQUIPMENT

- Blowout Preventers
- Associated Well Control Equipment
- Choke Manifold and Chokes
- Auxiliary Equipment
- Barriers
- Testing
- BOP Control Systems

INTRODUCTORY COURSE TO WELL INTERVENTION (L2 IWCF)

Duration: 5 days

Objectives

Theoretical & practical course providing candidates at introductory level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IWCF testing.

Who should attend

Any personnel working on the rig who needs an introductory training in well intervention.

Prerequisite

None

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)

WELL INTERVENTION
(L3 IWCF)
Duration: 5 days

Objectives

Theoretical & practical course providing candidates at the driller level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IWCF testing.

Who should attend

Engineers and technicians who are involved in the planning and realization of well intervention operations as wireline, coiled tubing, snubbing.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L2 IWCF, Introduction to Well Intervention, to access to this training. The dispensation can be given to candidates who have undergone industry accepted vocational training.

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)

WELL INTERVENTION
(L4 IWCF)
Duration: 5 days

Objectives

Theoretical & practical course providing candidates at supervisory level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IWCF testing.

Who should attend

Engineers and technicians who are involved in the planning and realization, and supervising of well intervention operations as wireline, coiled tubing, snubbing.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L3 IWCF, Well Intervention, to access to this training. The dispensation can be given to candidates who have successfully completed an appropriate in-house graduate training program.

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)

INTRODUCTORY COURSE TO WELL CAP (L2 IADC)

Duration: 5 days

Objectives

Theoretical & practical course for surface installations at introductory level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IADC testing.

Who should attend

Any personnel working on the rig who needs an introductory training in well control.

Prerequisite

None

Program

At the end of the training the delegates will be able to understand the followings:

- Blowout Prevention Selection
- Diverter Systems – Purpose
- Classification of Blowout Preventers
- BOP Operational Characteristic Tests
- Choke Manifolds – Purpose
- Kill Lines
- Control Systems
- Remote Control Panels
- Closing-in Kicks (Soft & Hard)

WELL CAP
(L3 IADC)
Duration: 5 days

Objectives

Theoretical & practical course for surface installations at driller level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IADC testing.

Who should attend

Anyone involved in drilling and/or well control operations in a non-supervisory position: all positions from floorman to driller inclusive.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L2 IADC, Introductory Course to Well Cap, to access to this training. Dispensation can be given to candidates who have undergone industry accepted vocational training.

Program

At the end of the training the delegates will be able to understand the followings:

- Blowout Prevention Selection
- Diverter Systems – Purpose
- Classification of Blowout Preventers
- BOP Operational Characteristic Tests
- Choke Manifolds – Purpose
- Kill Lines
- Control Systems for Purpose Mounted
- Remote Control Panels
- Closing-in Kicks (Soft & Hard)

WELL CAP
(L4 IADC)
Duration: 5 days

Objectives

Theoretical & practical course for surface installations at supervisor level. The course is designed to enhance the understanding of the fundamentals of well control that can be applied at most well control operations, and to prepare candidates for IADC testing.

Who should attend

Anyone involved in drilling and/or well control operations: all positions from driller inclusive.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L3 IADC, Well Cap, to access to this training. Dispensation can be given to candidates who have successfully completed an appropriate in-house graduate training program.

Program

At the end of the training the delegates will be able to understand the followings:

- Blowout Prevention Selection
- Diverter Systems – Purpose
- Classification of Blowout Preventers
- BOP Operational Characteristic Tests
- Choke Manifolds – Purpose
- Kill Lines
- Control Systems for Purpose Mounted
- Remote Control Panels
- Closing-in Kicks (Soft & Hard)

INTRODUCTORY COURSE TO WELL INTERVENTION (L2 IADC)

Duration: 5 days

Objectives

Theoretical & practical course providing candidates on the introductory level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IADC testing.

Who should attend

Any personnel working on the rig who needs an introductory training in well intervention.

Prerequisite

None

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)

WELL INTERVENTION
(L3 IADC)
Duration: 5 days

Objectives

Theoretical & practical course providing candidates on the driller level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IADC testing.

Who should attend

Engineers and technicians who are involved in the planning and realization of well intervention operations as wireline, coiled tubing, snubbing.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L2 IADC, Introduction to Well Intervention, to access to this training. Dispensation can be given to candidates who have undergone industry accepted vocational training.

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)

WELL INTERVENTION
(L4 IADC)
Duration: 5 days

Objectives

Theoretical & practical course providing candidates on the supervisor level with an understanding of pressure control methods relating to the various well servicing operations, and to prepare candidates to IADC testing.

Who should attend

Engineers and technicians who are involved in the planning and realization, and supervising of well intervention operations as wireline, coiled tubing, snubbing.

Prerequisite

Starting from September 1st, 2014 every new candidate must pass the L3 IADC, Well Intervention, to access to this training. Dispensation can be given to candidates who have successfully completed an appropriate in-house graduate training program.

Program

- Overview of completions
- Well control methods
- Reasons for well interventions
- Overview of well intervention services (wire line/coiled tubing/ snubbing)
- Pressure basics
- Production well kill fundamentals
- Well kill simulation and verification
- Equipment and operating procedures
- Hydrates (formation & prevention)
- Flanges and gaskets
- Failures and effects (wireline/coiled tubing/snubbing)