

Geology & Exploration

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An Introduction to Petroleum Exploration for Non-Geologists

Course Objectives:

Designed for those involved or interested in exploration and development, to whom, a broad overview of what it entails would be useful. No technical or scientific knowledge is assumed.

Course Duration: Three days

Course Contents:

- The philosophy of exploration
- Some basic geology relevant to petroleum
- The nature, formation and entrapment of petroleum and their applications to exploration
- The world-wide habitat of petroleum
- Geological and geophysical exploration techniques
- Drilling and logging of wells
- Reservoir development and production
- Reserves estimation and risk assessment
- A review of the North Sea as a case history

Who Should Attend:

Of benefit to technicians, secretaries, draftspeople, personnel and administrative staff, engineers and computer specialists, lawyers, economists, bankers, stockbrokers and government officers.

Basic Petroleum Geology and Geophysics

Course Objectives:

- To give participants a basic understanding of petroleum geology techniques, and methodology.
- To enable participants better to support and/or liaise with petroleum geologists.

Course Duration: Five Days

Course Contents:

- General principles of petroleum geology
- The study of strata and the geological succession
- Seismic surveys and their interpretation
- Geological drilling and the logging of cores
- Petrophysical log analysis
- Seismic stratigraphic interpretation
- Occurrence of oil and gas
- Petroleum systems and organic chemistry
- Principles of Reservoir Engineering
- Fundamentals of reserves estimation and risk

Who Should Attend:

All geoscientists, who deal with, or are likely to be involved with petroleum geology. This course may also be adapted for non-geoscientists.

Presenter:

The British Geological Survey, Course leader Gary Kirby or Robert Gatliff on behalf of ORCA Marketing and Consultancy Ltd

Basic Well Test Analysis

Course Objectives:

To cover the basic theory and practice of well testing. It has been designed to reflect the universal acceptance of computer-aided interpretation methods and will give participants an opportunity to analyse some field examples using state-of-the-art PC based software.

Course Duration: Five days

Course Contents:

- Introduction (reservoir performance, basic concepts, need for testing)
- Steady state, semi-steady state and transient well performance
- Drawdown testing
- Building testing
- Semilog analysis
- Diagnostics and Derivative analysis
- Wellbore storage and type curve matching
- Linear discontinuities (sealing faults, strategic pinchouts)
- Late time boundary and depletion effects
- Vertically fractured reservoirs
- Naturally fractured reservoirs
- Variable rate analysis methods
- Gas well testing
- Skin factor analysis and well deliverability
- Reservoir limit testing
- Well test operations
- Test design

Who Should Attend:

Those with no previous experience in well testing, and also those needing a refresher course and whose experience does not include modern analysis techniques.

Drilling Engineering

Course Objectives:

To provide an introduction to wellsite drilling engineering techniques for geologists and engineers with limited operational experience.

Course Duration: Four days

Course Contents:

- Drilling Fluids Technology
 - Basic principles
 - API testing procedures
 - Types of mud systems
 - Water based mud design
 - Polymer systems
 - Oil based muds
 - Applications
- Drilling Fluid Hydraulics
 - Rheology
 - Pressure loss calculation
 - Cuttings recovery
 - Bingham Model
 - Power law
 - Turbulent flow
 - Flow and nozzle optimisation
 - Swab and surge
- Casing Procedures
 - Well planning
 - API standards
- Cementing Procedures
 - Cement jobs
 - Cement properties
 - API tests mix and yield volume
 - Calculations
- Drilling Bit Technology
 - Types of bits
 - Roller cone bit design
 - Fixed cutter bit design
 - IADC classification system
 - IADC dull grading scheme applications
- Horizontal Drilling
 - Applications
 - Techniques



- Borehole Problems and Stuck Pipe
 - Causes of stuck pipe
 - Methods of minimising risk
 - Teamwork

Well Control Operations

- Causes of kicks
- Kill methods
- Calculations

Who Should Attend:

Wellsite Geologists, Operations Geologists, Development and Exploration Geologists, Technical Assistants.

Presenter:

Martin B. Saunders, Manager; Stag Geological Services Ltd, on behalf of ORCA

ECONOMIC EVALUATION OF PETROLEUM PROJECTS

Course Objectives:

Economic evaluation depends on various factors ranging from reservoir geology to legal and fiscal regimes. Typical offshore projects have a life span of 20 years or more, during which time many important techno - economic decisions are made from exploration to abandonment. These stages are identified and appropriate decision criteria are reviewed within the constraint of uncertainty.

Course Duration: Five Days

Who Should Attend:

The course is intended for petroleum engineers and scientists who have no formal training in economic methods. It will also be useful for those working in the financial sector who are involved with project economics but have little or no background in oilfield development.

Throughout the course emphasis is placed on a clear understanding of the basic concepts and several tutorial examples are used to complement the lectures.

Course Contents:

EVALUATION CONCEPTS

- Book and market value
- Cash flow models
- Interest and Inflation
- Discounted cash flow
- Choice of discount rate

MEASURE OF VALUE

- Payback and return on Investment
- Capex per barrel
- Net present value
- Annual capital charge
- Internal rate of return
- Late stage negative cash flows
- Acceleration projects and multiple roots
- Screening and ranking criteria

TAXATION

- Tax objectives and policy
- Royalty
- Petroleum review tax



Corporation tax
Taxation and petroleum
engineering decisions

RISK ANALYSIS

Sources of project risk
Risk reduction
Sensitivity analysis

DECISION ANALYSIS

Simple and stochastic
Decision criteria
Decision trees
Conditional probability and Bayes' theorem
Value of information

Extension and Inversion Tectonics

Course Objectives:

- To ensure that participants understand and have practical experience of:
- The tectonic principles and processes underlying sedimentary basin evolution.
- A range of techniques required for basin analysis.
- Participants will gain a new understanding of the structural geology of sedimentary basins with emphasis on mechanisms of basin subsidence and inversion in terms of extensional and contractional lithospheric processes.

Course Duration: Five Days

Who Should Attend:

Geoscientists required to work, on sedimentary rocks, sedimentary basins, and/or their associated faults. Experience in seismic interpretation would be an advantage and a basic knowledge of physics and mathematics is necessary.

Course Contents:

- Mechanical properties of the continental lithosphere
- Crustal extension, isostatic and geometrical constraints, balanced cross-sections
- Lithospheric extension, backstripping and subsidence analysis, numerical models
- Fault analysis, fault populations, fractal distributions
- Stress-fields, reactivation and seismicity
- Basin inversion, depth of burial/uplift studies
- Practicals and case studies

Formation Pressure Evaluation for HPHT Wells

Course Objectives:

To explore the importance of pressure evaluation in the planning and successful drilling of exploration development wells.

Course Duration: Four days

Course Contents:

- Introductory Concepts
 - Hydrostatic and imposed pressures
 - Pressure gradients
 - RFT data and PZ plots
 - Normal pore pressure gradients
 - Pore fluid types
 - Worked examples
- Overburden Pressure Gradient
 - Data sources
 - Calculation of overburden pressure
 - OBG calculations
 - Worked examples
- Origin and Development of Geo-pressures
 - Rapid loading
 - Clay and evaporite diagenesis
 - Aquathermal pressuring
 - Tectonism
 - Hydrocarbon generation and migration
- Pore Pressure Detection and Evaluation
 - ROP and drilling exponents
 - Formation gas evaluation
 - Borehole behaviour
 - Drilling parameters
 - Drill cuttings and cavings
 - Geothermal gradients
 - Wireline/MWD data
 - Evaluation of Dxc
 - Evaluation of ROP, gas, shale density
 - Evaluation of flowline temperature
 - Evaluation of resistivity, sonic
 - Density logs

- Fracture Pressure Gradients
 - Leak off and formation integrity
 - Tests
 - Extended reach wells
 - Development of fracture pressure
 - Models
 - Eaton's Method
 - Zero Tensile Stress Method
 - Worked examples
- Kick Tolerance and Well Planning
 - Casing programme
 - MAASP calculations
 - Zero influx model
 - Worst case examples
- Well Control Procedures
 - Worked examples
- South China Sea Example
- North Sea HPHT Case Study

Who Should Attend:

Geologists, Geophysicists, Petroleum and Drilling Engineers

Some wellsite or operations experience and a basic knowledge of geology are beneficial for this course.

Presenter:

Martin B. Saunders, Manager Stag Geological Services Ltd, on behalf of ORCA

Geology in Wellsite Operations

Course Objectives:

- To provide theoretical and practical training to those participants whose work takes place at the wellsite or who directly supervise those engaged in wellsite operations.
- To provide participants who routinely use wellsite acquired data with an understanding of the techniques used to collect the data and an appreciation of the reliability and quality of the data.
- To familiarise participants with the importance of geological input into the design and planning of a drilling programme.

Course Duration: Five days

Course Contents:

- The Course consists of twenty modules:
- Basic drilling operations; Borehole configuration; Well objectives; Well planning; Geological data collection; Mud logging; Wellsite geological reporting; Drill cuttings analysis; Subsurface gases; Subsurface fluid pressure; Coring operations; Sidewall cores; MWD and horizontal drilling; Oil shows; Wellsite biostratigraphy; Wellsite geochemistry; Wireline log supervision; RFT testing; Wellbore seismic surveys; Composite logs and final well reports.
- There are ten practical exercises, largely concerned with identification and description.

Who Should Attend:

Geologists who work or may visit the wellsite or who use wellsite acquired data in their work. The course provides a sound theoretical training for junior/trainee wellsite and operations geologists. Also useful to petroleum and drilling engineers, and helpful to technical assistants and those involved in data handling.

Each participant will receive a copy of the course manual together with exercise handouts and worked answer sheets. The presenter has developed several courses in Operations and Wellsite Geology, designed to meet the requirements of industry clients in staff development and training, which are regularly presented in the UK, Holland and overseas.

Presenter:

Andrew Rawlinson, Wellsite and Operations Geologist.

Geophysical Well-log Interpretation

Course Objectives:

- To make participants bonafide users of geophysical well logs.
- To enable participants to communicate intelligibly with geophysical well log users.
- To ensure that participants realise the limits of their abilities so that they know when to call for help from specialists.
- To show participants how to correct and interpret the principal kinds of geophysical logs.
- To show participants how to use geophysical well logs in an integrated fashion for application in porosity and petroleum evaluation, lithological and sedimentological interpretation and in stratigraphy.

Course Duration: Three Days

Course Contents:

- Resistivity logs, nuclear, sonic and other logs and the dipmeter
- Evaluation of fluid contents
- Evaluation of stratigraphy

Who Should Attend:

All geoscientists who use or are likely to use geophysical well logs.

Presenter:

The British Geological Survey, Course leader Ian E. Penn on behalf of ORCA Marketing and Consultancy Ltd.

Gravity and Magnetism in Today's Oil Industry: New Technology in a Changing World

Course Objectives:

- To review advances in data acquisition and processing technology.
- To address and review the issues of quality control in data acquisition and processing.
- To consider aspects of good survey design.
- To provide a detailed study of data processing and interpretation including presentation, qualitative and quantitative methods and the appropriate application of modelling methodologies.

Course Duration: Four days

Course Contents:

The programme will be a series of interactive seminars and practical “hands-on” map and computer based demonstrations/exercises addressing the following topics:

- What's new and what can we achieve today?
- Role of gravity and magnetism in oil exploration
- Critical evaluation of gravity and magnetic data acquisition and technological advances
- Survey design - tailoring for specific targets
- Data processing for digital products for today's requirements
- Quality control in acquisition and processing
- Visualisation - art and science
- Derived products and quick-look interpretation
- Semi-automated methods - the missing link?
- The appropriate use of modelling in quantitative interpretation
- Integration with existing geological and seismic data

Who Should Attend:

The two day course is more suited to exploration team members who need refreshing and updating, while the four day course is designed to provide a more in depth study with greater interactive practical.

Presenter:

Getech Instructors, University of Leeds on behalf of ORCA Marketing and Consultancy Ltd.

High Resolution Sequence Stratigraphy in Exploration & Production

Course Objectives:

To give experience in understanding and applying the concepts of 2D and 3D high resolution sequence stratigraphy in rift, foreland and passive margin basins. Reservoirs and reservoir-analogue outcrop datasets will include shallow marine/deltaic, coastal plain, turbidite and fluvial systems, within which participants will become familiar with the identification, and correlation of key surfaces, parasequences, systems tracts, high frequency sequences and sequence sets

Course Duration:

Three days in the classroom and includes both outcrop and subsurface practical exercises as major components.

The basic course can be combined with a core workshop or field trip and can be extended to four days. A “stripped down” version can be given in two days.

Course contents include:

- Introduction and basic definitions
- Historical development of seismic stratigraphy. Seismic reflector types and patterns. Time lines. Differences between lithostratigraphy and chronostratigraphy and implications for correlation. Definition of basic terms and concepts of relative sea level and accommodation space. The original Vail model. Parasequences and their stacking patterns. Parasequence boundaries and their expression.
- The main content of the course is made up of eight practical exercises using data from a range of sedimentary environments worldwide.

Who Should Attend:

Designed for exploration and production geologists, seismic interpreters, biostratigraphers and petroleum engineers.

This course was developed for Shell and has run in UK, Nigeria, Oman, Brunei, Thailand and the Netherlands. It has also been given for BG Pakistan, YPF Argentina, Lasmo and De Beers Marine.

Presenter:

Liverpool University: Course leaders; Dr Steve Flint and Dr John Howell on behalf of ORCA Marketing and Consultancy Ltd.

Introduction to Drilling and Completions

Course Objectives:

To give a comprehensive understanding of drilling and completions operations and techniques.

Course Duration: Five days

Course Contents:

- Origin of oil and gas;
- Reservoir fluids;
- Drilling rig equipment;
- Rig power systems;
- Hoisting equipment;
- Pipe handling; Drill string & components;
- Circulating system; Degassers; Mud mixing systems;
- Planning and programming a well;
- Drilling operations; Drill stem testing;
- BOP equipment and well control;
- Blowout Preventers;
- Primary well control;
- Causes of kicks;
- Shut in procedures;
- Simulator exercise - circulating out a kick;
- Completions and workovers;
- Completions types; Completion design;
- Completion equipment;
- Causes of workover (Well problems).

Who Should Attend:

Those who require a comprehensive knowledge of drilling and completions operations.

Introduction to Petroleum Geology

Course Objectives:

To provide an introduction to petroleum geology and operational and wellsite geological procedures for non-geologists.

Course Duration: Three days

Course Contents:

- Introduction to Geology
 - Structure and composition of the earth
 - The Time Scale, Stratigraphy and fossils
 - Geological processes
 - Basic rock types and classifications
 - Folding and faulting
- Sedimentary Rocks
 - Classification schemes
 - Clastics
 - Carbonates
 - Chemical rocks
 - Surface processes
 - Environments of deposition
 - Depositional features
 - Sedimentary structures
- Petroleum Geology
 - Origins of hydrocarbons
 - Migration and traps
- Sedimentary Petrology
 - Mud rocks
 - Clastic rocks
 - Carbonates
 - Chemical rocks
- Wellsite Description and Analysis
 - Sample collection and processing
 - Drill cuttings/Oil show evaluation
- Case Study
 - Lithological evaluation
 - Oil show evaluation/Reservoir plays
 - Drilling problems

Who Should Attend:

Drilling and Petroleum Engineers, Directional Drillers, Mud Engineers, Bit Design and Application Engineers, Office Support Staff

Presenter:

Manager; Martin B. Saunders, Stag Geological Services Ltd. on behalf of ORCA Marketing and Consultancy Ltd.

Introductory 2-D Seismic Interpretation Course

Course Objectives:

A paper-based introductory seismic interpretation course, including a hands-on interpretation project.

Course Duration: Five days

Course Contents:

- Ties to wells, ties between wells and typical problems, etc.
- Initialisation of interpretation. Work station v. paper data. Selection of picks.
- Sources of shotpoint information. Data preparation before interpretation, etc.
- Starting the interpretation. Studies of data quality, structure, leads, etc.
- Identification of features observed on seismic data, including faults, etc.
- Detailed methodology of interpretation, including static shifts between surveys, use of stacks and migrations, etc.
- Regional interpretations, detailed interpretations.
- Mapping, accurate contouring, treatment of mis-ties, treatment of faults, etc.
- Philosophy of final reports.
- Interpretation project on a self-contained survey containing examples of main features of the course, including well ties, steep dips, good and poor events.

Who Should Attend:

New graduates being introduced to the practicalities of interpretation, and support staff to give them an idea of what is being done by geophysicists.

Courses incorporate material published by the presenter in “Geophysics”. Course will use the client’s own seismic data.

Presenter

Colin O’Brien, Interpretation Geophysicist

Operations Geology and Petrophysics

Course Background & Objectives:

This course is designed to provide training in the practice and theory of operations geology and petrophysics. It is suited to all those who supervise or are directly involved in wellsite data acquisition and evaluation. It is also suited to those who are involved in well planning and well proposals.

Exploration and Development geologists who have little operational experience will also benefit by gaining a greater understanding of the working environment and wellsite conditions, which have an important impact on the quality, and accuracy of wellsite data. This will lead to more informed use of wellsite data and more effective design of data acquisition programmes.

The basic principles and function of wireline logging tools are covered together with wellsite supervision and quality control. Lithological and basic level petrophysical log evaluation are also included.

The importance of geological input into the design and planning of a drilling programme is emphasised by discussion of geological hazards with particular emphasis on potential drilling problems. The requirement for close co-operation between geological, drilling and well engineering departments in successful drilling operations is highlighted.

A large amount of data is acquired (at substantial cost), during a drilling operation;

- Mud logs
- Wireline logs
- MWD logs
- Lithologs
- Cores and sidewall cores
- Micropalaeontology data
- Geochemistry data
- Well seismic data
- Formation pressure data
- Drilling and Well Engineering data

Course Duration: Five Days

Who Should Attend:

This course is designed for those who plan , supervise, evaluate or are otherwise involved in the acquisition or use of this data.

In particular the course is suited to:

- Operations Geologists
- Operations Petrophysicists
- Wellsite Geologists

- Exploration Geologists
- Development Geologists
- Drilling Engineers
- Petroleum Engineers
- Technical Assistants
- Supervisory and Management staff

This course is also suited to Drilling Engineers who wish to gain a greater understanding of the geological and data acquisition aspects of the drilling operation.

Course Contents:

In particular the course covers the following topics:

- Basic Drilling Operations
- Borehole Configuration
- Well Objectives
- Well Planning and Design
- Geological Data Acquisition
- Mud Logging
- Wellsite Geological Reporting
- Drill Cuttings Analysis
- Subsurface Gases
- Subsurface Fluid Pressure
- Coring Operations
- Basic Core analysis
- Sidewall Cores
- MWD and Horizontal Drilling
- Oil Shows
- Biostratigraphy
- Geochemistry
- Wireline logging tools
- Wireline log supervision
- Wireline logs – lithological interpretation
- Wireline logs – basic level petrophysical interpretation
- RFT Testing
- Wellbore Seismic Surveys
- Composite Logs and Final Well Reports

Case Studies & Practical Exercises

Exercises are included in the course programme and are used to gain practice in data evaluation and to emphasise the important learning points.

Operations & Wellsite Geologist

Course Objectives:

To provide an introduction to the responsibilities of both wellsite and office based operations geologists.

(Emphasis is placed on witnessing wireline logging operations).

Course Duration: Three days

Course Contents:

- Operations Geology Overview
 - Provision of wellsite services
 - Provision of shorebase services
 - Scope of services
 - Tender evaluations and awards
 - Pre-Spud preparations
- Wellsite Geology
 - Duties and responsibilities
 - Drill cuttings evaluations
 - Hydrocarbon shows
 - Drilling engineering
- Supervision
 - Mudlogging services
 - MWD services
 - Coring services
 - Biostratigraphy
 - Geochemistry
 - Wireline logging
 - Formation testing
 - Wellsite velocity services
- Wellsite communications

Who Should Attend:

Inexperienced Wellsite and Operations Geologists, Senior Mud Loggers, Technical and Support Staff moving into Operational roles.

Presenter:

Manager; Martin B. Saunders, Stag Geological Services Ltd. on behalf of ORCA Marketing and Consultancy Ltd.

ORCA Oil & Gas Exploration Courses

Training Reference	Course Title	Course Required & Dates Required
Exp 001	Introduction to Petroleum Exploration for Non Geologists	
Exp 002	An Introduction to Seismic Stratigraphy	
Exp 003	Basic Petroleum Geology and Geophysics	
Exp 004	Basic Well Test Analysis	
Exp 005	Carbonate Reservoir Description	
Exp 006	Drilling Engineering	
Exp 007	Economic Evaluation of Petroleum Projects	
Exp 008	Extension and Inversion Tectonics	
Exp 009	Formulation Pressure Evaluation for HPHT Wells	
Exp 010	Geology in Well Site Operations	
Exp 011	Geophysical Well Log Interpretation	
Exp 012	Gravity and Magnetics in Today's Oil Industry	
Exp 013	High Resolution Sequence Stratigraphy in Exploration and Production	
Exp 014	Introduction to Drilling and Completions	
Exp 015	Introduction to Petroleum Geology	
Exp 016	Introductory 2 - D Seismic Interpretation Course	
Exp 017	Operations Geology and Petrophysics	
Exp 018	Operations and Well Site Geologist	
Exp 019	Petroleum Geochemistry in Oil Exploration	
Exp 020	Pragmatic Migration - A Method for Interpret ting 2-D Seismic Data	
Exp 021	Principles of Reservoir Engineering	
Exp 022	Production Optimization	
Exp 023	Reservoir Geochemistry	
Exp 024	Seismic Data Processing: An Introduction to Successful Project Management	
Exp 025	Seismic Reflection Interpretation	
Exp 026	Sequence Stratigraphy and Petroleum Geology of the Bookliffs and Paradox Basin, South Central Utah	
Exp 027	Structural Interpretation of Seismic Data for Exploration and Development Geologists	
Exp 028	Well Site Operations	
Exp 029	Wire Line and MWD Interpretation	
	Please indicate course/s required & dates and return by email or fax, many thanks.	

PERFORMANCE MANAGEMENT AND APPRAISAL

COURSE INTRODUCTION:

Defining the skills and competencies required for excellent performance is the pre-requisite for creating personal development plans for individuals in order to meet the strategic goals of the organisation.

This course provides delegates with the opportunity to develop their capability for designing, developing and implementing performance management systems in accordance with the needs of their organisation for Performance Appraisal Reviews.

COURSE DURATION: Three Days

COURSE AIM:

To identify the elements of and strategies for designing, developing and implementing a performance management and appraisal review system within the organisation.

COURSE OBJECTIVES:

This course is designed to give the participants the skills, knowledge and understanding to:

- Analyse how performance management relates to organisational goals and expectations and how to achieve best results by performance measurement
- Identify the strategies required for effective managing of individual performance and performance strategies
- Design and Implement a successful performance appraisal review system
- Identify the methods and Tools available for measuring performance
- Relate performance management to pay and other organisational Incentives and rewards available
- Explore the continuing process of performance management and the continues review approaches
- Identify methods of evaluating the effectiveness of performance management
- Prepare a personal action plan for future implementation

METHODOLOGY:

The learning methods used will be interactive with a mixture of lecture, discussion, practical exercises, role-play and case studies in a workshop environment. There will be self and peer assessment.

WHO SHOULD ATTEND:

Human Resource Specialists, Managers and those involved in designing, managing and implementing performance management systems and appraisals of company staff and personnel.

COURSE CONTENTS:

MODULE 1

DEFINING PERFORMANCE MANAGEMENT

- Concepts and Philosophy
- PM Development – Merit Rating, Management by Objectives, Performance Appraisals and Performance Management
- ***Staff Performance in the Organisational Context***
- The Objectives of Performance Management

MODULE 2

STRATEGIES FOR MANAGING PERFORMANCE

- The Principles of PM
- A Framework of PM
- ***The Organisation's and the Individual's Contribution to PM***
- The Process of PM
- Behavioural Systems – Work Objectives and Performance Measures
- ***Personality, Competence and Results Orientated Systems***

PERFORMANCE MANAGEMENT AND APPRAISALS

MODULE 3

PERFORMANCE APPRAISAL

- ***What is Performance Appraisal?***
- Designing the Appraisal System
- The appraisal Interview – 7 Steps to Successful Appraisals
- Training for Appraisal
- The Advantages and Disadvantages of Appraisal

MODULE 4

METHODS OF MEASURING PERFORMANCE

- ***Behavioural Anchored Rating Scales***
- Ranking Scales
- Reporting Critical Incidents
- 360 degree Feedback

MODULE 5

PERFORMANCE RELATED PAY

- Employee Involvement
- Incentives
- Reward Schemes
- Career Aspirations

MODULE 6

THE CONTINUING PROCESS OF PERFORMANCE MANAGEMENT

- Updating Objective
- Managing Continuous Learning
- Managing Under Performers

MODULE 7

EVALUATING PERFORMANCE MANAGEMENT

- Project Teams
- The Role of the HR Function
- Using External Consultants
- Monitoring and Evaluating

MODULE 8

SEMINAR REVIEW

- ***Personal Action Planning***
- ***Seminar Evaluation & Summary***

Petroleum Geochemistry in Oil Exploration

Course Objectives:

To explain the fundamentals of petroleum geochemistry, and show how it may be used to increase exploration success.

Course Duration: Flexible for up to ten days, depending on the level to be covered, practicals sessions are included in the extended versions.

Course Contents:

- Introduction to geochemistry
- Controls for source rock deposition
- Source rock analysis - kerogen typing and maturation oil chemistry and post-accumulation alteration processes
- Oil-source rock correlation
- Origin and composition of natural gas
- Migration
- Maturation modelling
- Planning geochemical sampling and analytical programmes

Who Should Attend:

Geologists, geophysicists, petroleum engineers engaged in exploration and production.

Presenter:

Dr Jenny Miles, Geochemist

Pragmatic Migration - A Method for Interpreting 2-D Migrated Seismic Data

Course Objectives:

Correction of mis-ties created by steeply dipping seismic data, and preparation of corrected maps, in paper-based interpretation.

Course Duration: Two days, can be extended depending on the level required

Course Contents:

- Introduction to the mis-tie problem.
- Discussion of dangers involved in using migrated lines.
- Demonstration of methods of tying loops using migrated seismic lines provided by client.
- Producing a contour map from the digitised results.
- Conclusions arising from the “pragmatic migration” approach.

- The practical demonstration of the techniques involved forms a major part of the course; attendees are expected to work some lines to their own satisfaction and demonstrate to themselves that the technique can help in complex areas.

Who Should Attend:

Seismic interpreters and others involved in the practical use of seismic data.

Course incorporates material published by the presenter in “Geophysics”. No formal notes ready for distribution yet. Course will use the client’s own seismic data.

Presenter:

Colin O’Brien, Interpretation Geophysicist

PRINCIPLES OF RESERVOIR ENGINEERING

Course Objectives:

This five-day course covers the principles of reservoir engineering. It presumes no basic knowledge of the subject and lays emphasis on the fundamental concepts.

Application of these basic principles, are given for reservoir performance and for water flood calculations. An introduction is given and the interface between petroleum geology and reservoir engineering.

Course Duration: Five days

Course Contents:

INTRODUCTION

RESERVOIR PRESSURES

RESERVOIR ROCK PROPERTIES

Porosity, permeability, capillary pressure and relative permeability

Permeability distributions in heterogeneous reservoirs
Fluid saturation and distribution
Measurement of rock properties

RESERVIOR ROCK PROPERTIES

Porosity, permeability, fluid saturations

Multiple fluids
Capillary pressure & relative permeability
Measurement of rock properties

RESERVOIR FLUID PROPERTIES

Composition and phase behaviour of reservoir fluids

Properties of gases, liquids and gas condensates
PVT analysis and interpretation of reports

FUNDAMENTALS OF FLUID FLOW

Radial flow, steady-state and semi-steady-state flow

Productivity index (PI)
Well performance considerations
Near wellbore alteration effects
Skin factors and damage mechanisms
Introduction to well testing

RESERVOIR DRIVE MECHANISMS

Natural drives: solution gas, gas cap and water drive mechanisms

Artificial drives: water and gas injection

RESERVOIR PERFORMANCE PREDICTION

USING THE MATERIAL BALANCE EQUATION

Material balance equation its application in undersaturated and depletion drive systems

Water influx calculations

IMMISCIBLE DISPLACEMENT AND WATERDRIVE

Fractional flow Buckley-Leverett description of waterdrive in one dimension

Graphical technique of Welge

Recovery calculations

Application of Buckley-Leverett equation in two dimensions, segregated flow, and layered reservoirs.



RESERVOIR GEOLOGY INTERFACE

An introduction into integration of geology reservoir modelling.

Who Should Attend:

The course is suitable for a wide group of technical personnel and those starting in reservoir engineering.

Presenters:

Professor Adrian Todd
Dr. Jim Somerville

PRODUCTION OPTIMISATION

Course Objectives:

The course is based on a consideration of the total production system, from reservoir to surface. A brief review of inflow performance is followed by the development of concepts and multi phase flow up through the production tubing. Emphasis is placed on analysis of vertical lift characteristics of production wells by means of Nodal analysis.



An important element of the course consists of artificial lift design, particularly with respect to gas lift, ESPs and jet pumps. An Introduction to multi-well modelling and optimisation is also included. The course contains many practical examples of production optimisation and related field problems.

Course Duration: Five Days

Who Should Attend:

The course is intended for petroleum, reservoir and production engineers and others interested in methods of increasing and/or optimising oil recovery through analysing and upgrading the production system by installation or upgrade of artificial lift and other means. The course deals with primarily with flow modelling of the production system and thus forms a logical extension to its companion course entitled 'Reservoir Inflow Performance', although attendance at the latter is not a pre-requisite.

Course Contents:

RESERVOIR PERFORMANCE

Reservoir inflow performance:
Oil and Gas wells
Transient PSS and steady state flow
Fluid PVT modelling
Pressure formations for gas inflow
Non - Darcy flow
Elements of measured skin

VERTICAL LIFT PERFORMANCE

Vertical lift performance
Single-phase flow in pipes
Flow through restrictions and chokes
Nodal analysis
Multiphase flow: hold-up, flow regime
Maps and flow correlations
Temperature and heat loss modelling
Well performance modelling
Well model tuning to field requirements

INTRODUCTION TO ARTIFICIAL LIFT

Requirement and justification for artificial lift
Artificial lift techniques



GAS LIFT TECHNOLOGY

Gas lift requirement evaluation
Single well gas lift design
Transfer margins and valve spacing
Compression, casing head conditions
Fluid and casing lift valves
Economic considerations

ELECTRIC SUBMERSIBLE PUMPS

AND JET PUMPS

Pump applications
Lift Hydrodynamics
Pump components, construction
And assembly
Pump performance design and selection methodology
Economic considerations

MULTI WELL PRODUCTION OPTIMISATION

Well performance curves

Lift gas allocation study

Reservoir Geochemistry

Course Objectives:

To give an understanding of the controls for the generation of different hydrocarbon types present in a reservoir, the subsequent natural alteration mechanisms, which can give, rise to production problems, and to show the application of geochemistry to lateral and vertical reservoir continuity studies.

Course Duration: Three days

Course Contents:

- Sampling and analytical methods used on geochemistry
- Migration of petroleum and reservoir filling
- Crude oil alteration mechanisms
- Tar mat formation
- Hydrogen sulphide and carbon dioxide origin and distribution
- Reservoir continuity studies-methods and practical examples
- Formation water analysis for geochemistry

Who Should Attend:

Production geologists and reservoir engineers.

Presenter:

Dr Jenny Miles, Geochemist

Course Objectives:

- To give participants a full understanding of the production flow of all types of 2D and marine 3D seismic data processing projects.
- To cover: project scheduling, quality control, parameter testing, problem solving and contractual issues.

Course Duration: Three days

Course Contents:

- A review of seismic processing emphasising those aspects that require the most careful supervision.
- Production processing - technical details, scheduling.
- Final products for interpretation and storage.
- The management of parameter testing.
- Systematic problem solving.
- Quality assurance and quality control procedures.
- Contracts and invoicing.

Who Should Attend:

Geophysicists and geologists who have recently become involved with the management of seismic data processing projects or who are being prepared for such a role. A basic knowledge of seismic data processing will be assumed.

Presenter:

Christopher H. Walker, (Geophysicist)

Seismic Reflection Interpretation

Course Objectives:

- To make participants 'bon a fide' interpreters of seismic sections.



- To enable participants to communicate intelligibly with seismic interpreters and exploration geologists.
- To ensure that participants realise the limits of their ability so that they know when to call for assistance from specialist seismic interpreters.
- To give participants experience of how seismic sections may be used in an integrated fashion to evaluate subsurface geology for both hydrocarbon and geological survey purposes.

Course Duration: Three Days

Course Contents:

- Seismic reflection theory
- Geology and the seismic section
- interpretation procedures
- Mapping exercises

Who Should Attend:

Geoscientists who wish or need to become acquainted with the seismic reflection method.

Presenter:

The British Geological Survey. Course leader, Gary Kirby on behalf of ORCA Marketing and Consultancy Ltd.

[Sequence Stratigraphy and Petroleum Geology of the Bookliffs and Paradox Basin, South Central Utah](#)

Course Objectives:

The course is in two parts:



The first three days concentrate in the study of sequence stratigraphy in one of the classic areas of extensive exposure through upper Cretaceous shallow marine, shoreface and fluvial sediments, Participants learn the concepts of seismic stratigraphy and apply these to outcrops.

The second part of the course examines the sedimentology and structure of the Permo-Triassic to Cretaceous sediments of the Paradox Basin, and related observations to petroleum geology. Key elements include the sedimentology and sequence stratigraphy of non-marine red-bed sequences, salt tectonics, and reservoir and structural aspects of major faults within the basin.

Course Duration: Five Days

Course Contents:

- A practical course in which participants are taught how to interpret outcrop data in terms of sequence stratigraphy.
- Introduction to the regional geology
- Sequence stratigraphy, facies architecture and sedimentology of the Blackhawk Formation
- The Moab Fault
- Sedimentology of the Permian Moenkopi/Chinli Formations and the Cretaceous Morrison Formation
- Salt tectonics in Arches National Park: salt walls, salt collapse fractures, ramps and flats associated with faulting
- Sedimentology and sequence stratigraphy of aeolian and fluvial Triassic to Jurassic strata

Who Should Attend:

Managers, exploration and production geologists and geophysicists.

Presenter:

The British Geological Survey. Course leaders, Phil Richards, Robert Gatliff and Gary Kirby on behalf of ORCA Marketing and Consultancy Ltd.

Structural Interpretation of Seismic Data for Exploration and Development Geologists

Course Objectives:



- Workshop to review the role of extensional and compressional modes of deformation in the development of hydrocarbon traps, using restoration and forward modelling techniques and depth-converted seismic profiles.
- Emphasis is given to examples provided by the client company and the depth conversion PC software is provided to participants as part of the course deliverables.

Course Duration: Three days, can be extended depending on level required.

Course Contents:

- One day in general review of structural geology concepts, emphasising the role of forward modelling in understanding complex areas, with examples from a range of extensional and compressional basins world-wide.
- Two days in workshop sessions, to be devised in association with the participating company.
- Course to be designed using client's own data as well as general case histories.

Who Should Attend:

Geologists and geophysicists working on complex structural plays and reservoirs.

Presenter:

Dr John Nicholson, specialist in sedimentology and structural geology on behalf of ORCA Marketing and Consultancy Ltd.

Wellsite Operations

Course Objectives:

To provide a basis for the understanding of the collection and interpretation of geological data as performed by Mudloggers and Wellsite Geologists.

To be a practical course in covering basic wellsite and drilling maths and allow extensive opportunity for microscope study of drill cuttings samples and oil show evaluation.

Course Duration: Five days

Course Contents:

- Drilling Rig Design
 - Land rigs;
 - Offshore rigs;
 - Platforms.
- Drilling Techniques
 - Drill bits:
 - BHA design
 - Drill pipe
 - Hoisting, Rotating, Mud motors
 - Motion compensation
 - Well control equipment
 - Circulating system
 - Drilling fluids
 - Casing and cementing operations
 - Directional drilling
 - Borehole problems and stuck pipe
- Drill returns Logging
 - Mud logging services and equipment
 - Hydrocarbon gas evaluation
 - Wellsite geology
 - Oil and gas show evaluation
 - Coring operations
- North Sea Case Study - Exercise
 - Cuttings description
 - Oil and gas show evaluation
 - ROP and borehole problems
 - North Sea stratigraphy and plays

Who Should Attend:

Geologists, Geophysicists, Petroleum and Drilling Engineers, Technical Assistants and Office support staff

Presenter:

Martin B. Saunders, Stag Geological Services Ltd. on behalf of ORCA Marketing and Consultancy Ltd.

Wireline Log & MWD Interpretation

Course Objectives:

To familiarise participants with the basic concepts behind open hole petrophysical logging operations and to cover the principles of Quick-look interpretation.



Identification of hydrocarbon bearing zones
Hydrocarbon type evaluation
Saturation calculations
Shaly sand interpretation

➤ Case Studies and Worked Examples

Who Should Attend:

Geologists, Drilling Engineers, Petroleum Engineers, Petrophysicists and Log Analysts.

Presenter:

Martin B. Saunders Stag Geological Services Ltd, on behalf of ORCA Marketing and Consultancy Ltd.