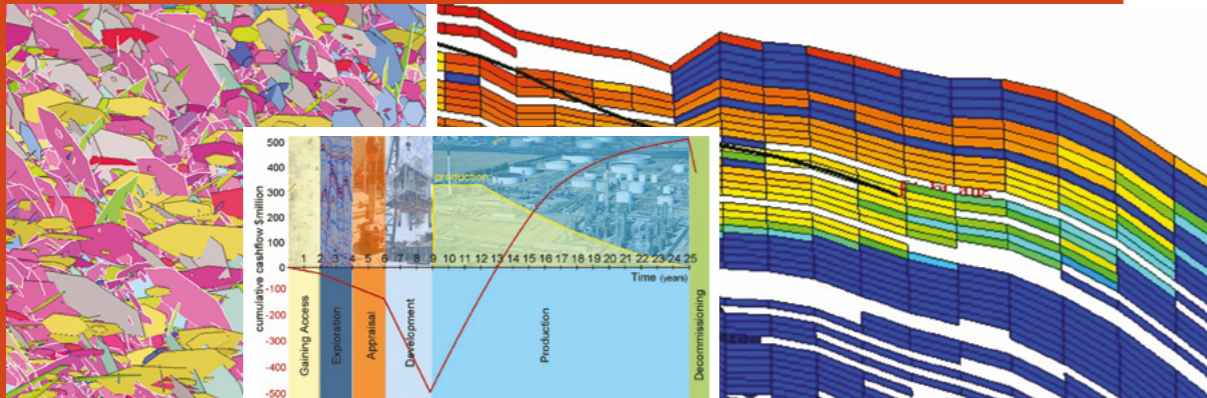


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Bringing the best of integrated, multidisciplinary training solutions to your workstation during these times of restricted, face-to-face opportunities.

Micro-learning and 1-1 Coaching

TRACS is also now delivering 1-2 hour or 1-2 day short sessions on any topics of choice from our portfolio. Content and timing can be specified by the client and we have delivering these to small groups or 1-1, often on sequential days or weeks to accommodate schedules. Maximise the benefit of online flexibility!

Full online courses

TRACS offers a selection of courses from across our Training Series, provided as in-house events and comprising live, tutor-led webinars adapted for delivery in

combination with digital learning resources. We have utilised the following delivery systems to date: Cisco Webex, Microsoft Teams, Blackboard and MS Teams or SEED (Moodle) to deliver files for courses

In recent months we have delivered Reservoir Engineering, Economics and Risk, Reservoir Model Design, Reservoir Characterisation, Mature Field Management and the E&P Foundation (multi-team-based early career)



"What if you don't need a full training course? Whilst traditional full courses are still a standard offering, the rapid expansion of Virtual Instructor-Led Training (vILT) has opened the door wide to micro-learning and we have embraced this as a natural expansion of course tailoring. TRACS training style remains the same: experiential learning, discursive style and interactive delivery. Please get in touch to discuss your needs and wishes"

*Arndt Peterhänsel
Global Head of Training, TRACS International*



Tutors



Course Duration (Days)

People

The tutor group, of more than 40 experienced staff members and close associates, works from TRACS offices in Aberdeen. The profiles below introduce a selection of the group involved in the development and delivery of new Virtual Instructor-Led Training material and in the organisation and maintenance of the portfolio.



Mark Bentley PhD

Main Series tutoring: Reservoir, E&P Overview, Open Air and Master Class

Industry experience: over 30 years, geoscience

Career background: Shell, AGR and TRACS

Personal:

Author 'Reservoir Model Design', SPE and EAGE distinguished lecturer, AGR (Training Director) & TRACS Training Director, Associate Professor Heriot-Watt University



Mark Cook BSc, MBA

Main Series tutoring: Early Development, Business & Risk, Reservoir Engineering

Industry experience: over 40 years, reservoir engineering, economics and risk analysis

Career background: Shell, TRACS (Director) and AGR (VP)

Personal:

Author, 'Author, 'Petroleum Economics and Risk Analysis' (2021) 'Hydrocarbon Exploration and Production' (2008) SPE distinguished lecturer on Risk Analysis, Guest lecturer at Heriot-Watt University



Mark Bramwell BSc, PhD

Main Series tutoring: Reservoir, Early Development, E&P Overview, Open Air

Industry experience: over 35 years, geoscience

Career background: Shell, KUFPEC, AGR and TRACS

Personal:

Programme manager for the Early Development Series



Jenny Garnham PhD

Main Series tutoring: Reservoir, Open Air

Industry experience: over 30 years, petrophysics

Career background: Enterprise Oil, AGR and TRACS

Personal:

Technical author, SPWLA active member, PESGB/SPE



Douglas Paton PhD

Main Series tutoring: Reservoir, Open Air

Industry experience: 20 years, geoscience

Career background: Conoco-Phillips, Chevron, BHP, Saudi Aramco, TectonKnow

Personal:

Published over 60 scientific articles and papers. Invited committee member, GCCSPEM Roberts meeting (2021). Invited member for AAPG International Research Committee (2017-present)



Jerry Hadwin BSc, MEng

Main Series tutoring: Reservoir, Early Development, Open Air

Industry experience: over 35 years, reservoir engineering

Career background: over 35 years, reservoir engineering

Personal:

Co-author 'Adventure Trekking in Oman



Jonathan Bellerby BSc (Hons), MEng

Main Series: Wells, Early Development

Industry experience: over 30 years, well technology

Career background: TBP, ICE, AGR, TRACS

Personal: Author, 'Well Completion Design'



Tim Wynn PhD

Main Series tutoring: Reservoir, Master Class (fractured reservoirs)

Industry experience: Over 25 years, geoscience

Career background: British Gas, GeoScience, ICE, AGR and TRACS

Personal:

SPE technical editor, technical paper author, geoscience publications



Arndt Peterhänsel PhD

Main Series tutoring: E&P Overview, Reservoir, Open Air

Industry experience: 20 years, Geoscience

Career background: University of Cambridge, Universität Potsdam, Saudi Aramco, Lukoil and TRACS

Personal:

Technical author, Global Head of Training (TRACS), Expert to The European Commission on Horizon Europe 2020 research programme



Howard Crumpton

Main Series tutoring: Wells

Industry experience: over 40 years, interventions and completions

Career background: Otis, Camco, Thistle Well Services, Wellserv, BP, TRACS and AGR

Personal:

Author, 'Well Control for Completions and Interventions

TRACS working with clients to develop blended offerings of our standard face-to-face courses



Existing courses

Courses available (timings can be flexed to suit clients needs):

EP02 Introduction to Exploration and Production (4 days)

EP08 The Energy Transition – Key Components

BR04 Economics and Risk Analysis (5 days)

- Can also be split into Economics (3 days) and Risk Analysis (2 days)

R11 Reservoir Engineering (5 days)

R08 Reservoir Model Design (4 days)

R20 Structural models from seismic data

MC07 Field Development Planning (4 days)

MC03 How to Make a Good Reservoir Model (1 day)

EP07 Mature Field Management (5 days)

R03 Geological Interpretation of Well Logs (5 days)

R16 Geomechanics (4-5 days)

W04 Completion Design (5 days)

EP02 Introduction to Exploration and Production

This course is designed for industry professionals who wish to be better informed about basic Exploration & Production methods, concepts and technology. It is also intended for others not directly working in oil and gas companies but who are providing related support services.



Mark Bramwell, Mark Bentley

The objective of this course is to provide a comprehensive introduction to the upstream industry.

Introduction to Exploration & Production takes you through all of the major stages in the life of an oil or gas field from exploration, through appraisal, development planning, production to decommissioning.

This course intends to help the student to understand the major technical and business considerations that make up each part of the life of a typical oil or gas field, and to demonstrate the link between the many disciplines involved.

Subjects are always introduced by pointing out the commercial application of the subject in order to clarify its relevance to the overall business.

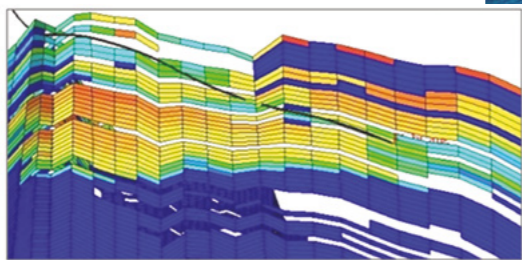
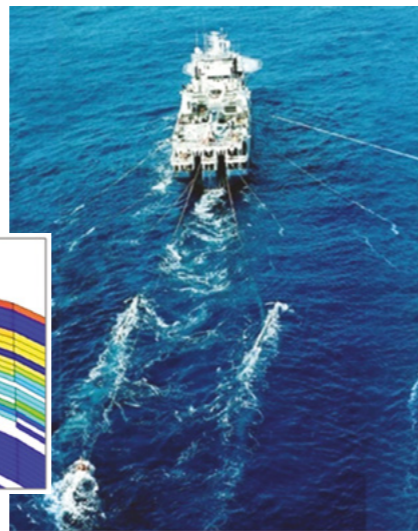
An ideal backdrop for discussions on scales of heterogeneity.

Duration: 2 days

Course Content:

Topics discussed:

- The field life cycle
- Exploration
- Drilling engineering
- Safety and the environment
- Reservoir description
- Data interpretation
- Volumetric estimation
- Field appraisal
- Reservoir dynamic behaviour
- Well dynamic behaviour
- Surface facilities
- Production operations and maintenance
- Project and contract management
- Petroleum economics
- Managing the producing field
- Managing decline
- Decommissioning



EP08 Introduction to the Energy Transition

This course is designed for energy professionals who wish to be better informed about the Energy Transition and path to Net Zero in terms of concepts and technology. It is also intended for others not directly working in Energy companies but who provide related support services.



Arndt Peterhänsel

The objective of this course is to provide a comprehensive overview to the Energy Transition and path to Net Zero. The course complements the "Energy Transition in a Day" course.

Over two days you will learn about the key components of the Energy Transition.

Gain an understanding of the major technical and business considerations that make up each part of the energy transition and to demonstrate the link between the component parts.

There are choices to make, affordable energy is the main driver for economic growth. Some aspects of the Energy Transition involve developing technologies which are expensive at present. Yet there is pressure from society to reduce greenhouse gas emissions to minimise climate change.

Course Content:

Topics discussed:

- CO₂ Emissions - Historic and Forecast
- Climate Change Policy
- Wind Power
- Solar Power
- Energy Storage
- Hydrogen Production
- Carbon Capture and Storage
- Electric Vehicles and Battery supplies
- Goods Vehicles/Rail/Shipping/Air - Alternatives to hydrocarbon fuels
- Heating for Domestic/Commercial/Industrial Sectors
- Environmental/Social/Governance Issues

Duration: 2 days

BR04 Economics and Risk Analysis

The course is designed for staff working in geoscience, engineering, finance, or commercial departments of oil and gas companies, or companies which supply finance or services to the oil and gas industry.



Mark Cook

The course will provide a structured approach to defining and analysing petroleum risks in the upstream business.

It will introduce decision-making tools and the supporting software, using case study material taken from oil and gas field examples to ensure direct applicability of the techniques covered.

The initial Petroleum Economics element of the course provides knowledge of the role of petroleum economics in decision making for both exploration and production ventures. It gives participants the skills to perform economic evaluations using a selection of indicators derived from discounted cashflow forecast, to rank projects against alternatives, and investigate economic robustness.

The objectives of the Risk Analysis section are achieved through the use of a case study taken from an offshore oil field development to identify, express and analyse technical and commercial uncertainties. This allows continuity between the various subjects covered. This

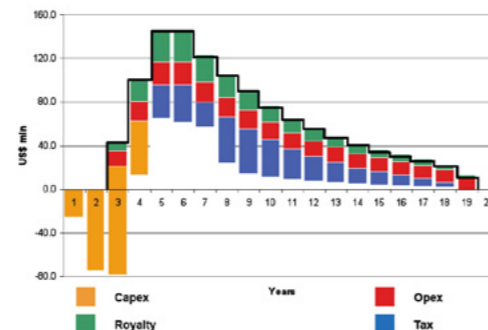
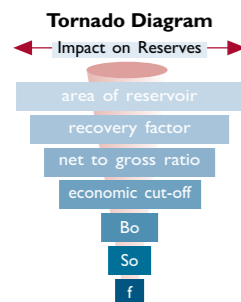
element will ensure that participants are fully familiar with techniques such as Monte Carlo simulation, Decision Tree Analysis, Parametric Analysis, sensitivity analysis, and that they have the software skills to support the application of these methods. Participants will be working with Crystal Ball and Decision Tree analysis software. Broader issues such as Portfolio Management are also introduced.

Course Content:

- Petroleum Economics - the basis of project evaluation
- Development Economics
- Exploration Economics
- Incremental Economics
- Risk Analysis
- Combining uncertainties
- Tools for Quantifying Risk
- Technical Uncertainties and their Management
- Commercial Uncertainties and their Management
- Portfolio Management

Duration: 5 days, or flexed to suit client needs.

Can also be split into Economics (3 days) and Risk Analysis (2 days)



R11 Reservoir Engineering

This course is designed for basic to intermediate reservoir engineers (0-5 years) and is also of benefit to geoscientists and other disciplines which interface with reservoir engineers in their daily work.



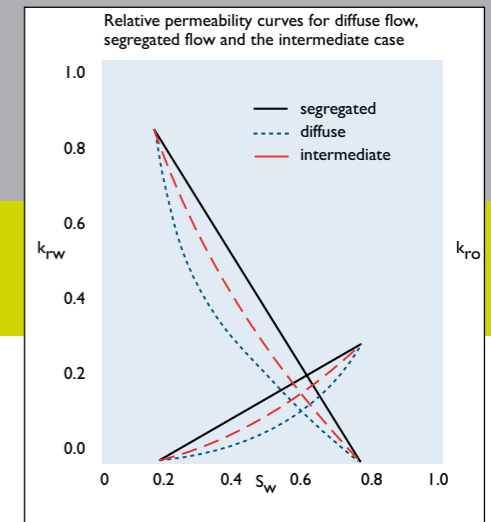
Mark Cook

The case study material covered in this course has been chosen to illustrate the application of reservoir engineering tools and techniques in a development planning and reservoir management context.

The course draws out the key interfaces between reservoir engineering and geoscience disciplines. Worked examples show the use of data and techniques employed during the construction and maintenance of a reservoir model. Separate examples are used for gas field reservoir engineering and well testing.

This process will follow specific phases of:

- building a static reservoir model
- fluid characterisation
- developing a dynamic model
- reservoir management during the producing life of a field

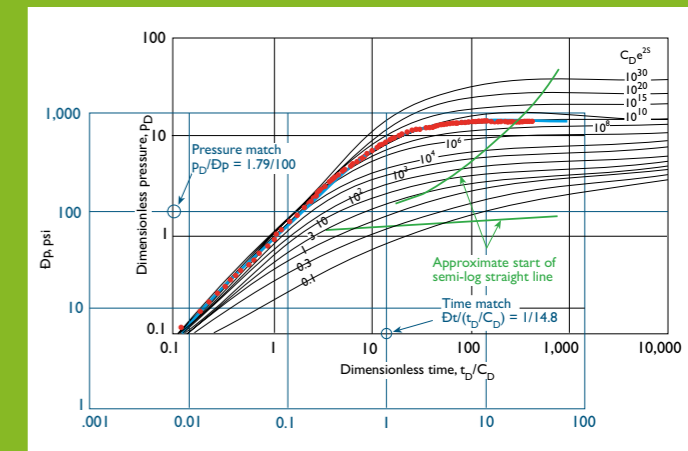


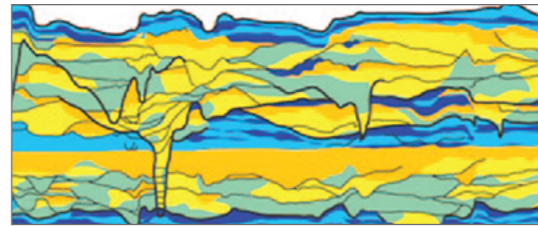
The reservoir engineering course makes significant use of an offshore case study with a sizeable oil reservoir.

Course Content:

- The Static Reservoir Model
- Fluid Properties
- Developing the Dynamic Reservoir Model
- Reservoir Management
- Well Test Analysis

Duration: 5 days, or flexed to suit client needs.





R08 Reservoir Model Design

The course is designed for Geoscientists with some knowledge of reservoir modelling software; reservoir engineers and petrophysicists who work with static reservoir models, and team leaders who wish to have a deeper understanding of the principles behind modelling and how to QC models made by others.

 
Mark Bentley

What differentiates a good reservoir model from a bad one?

This course offers a software-independent view on the process of reservoir model design, tackles the underlying reasons why some models disappoint, and offers solutions which support the building of more efficient, fit-for-purpose and successful reservoir models.

Considerable time is dedicated to reservoir modelling exercises in many companies but the results often disappoint: the time taken to build models is often too long, the models too detailed and cumbersome and the model deliverables ultimately not fit-for-purpose. This course tackles the reasons why and offers remedies to fix these problems. The advice is based on the experience of the tutors, who have been involved in excess of 100 reservoir modelling and simulation projects for many companies over the last twenty years.

The central theme of the event is "reservoir model design", on the premise that it is poor design rather than software handling errors which are typically the cause of poor model outcomes.

Course Content:

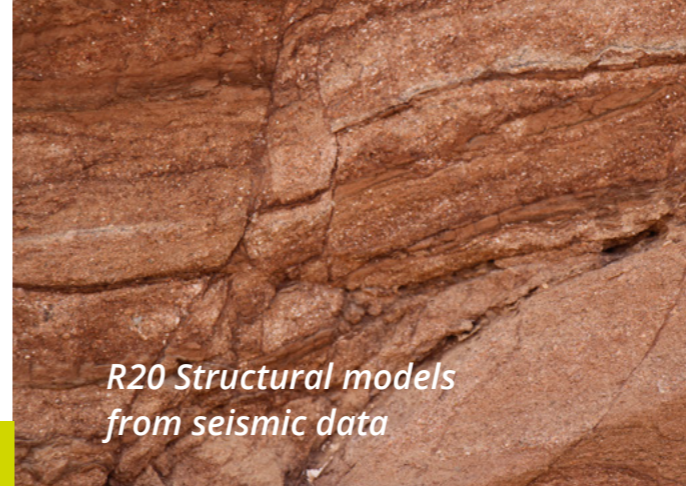
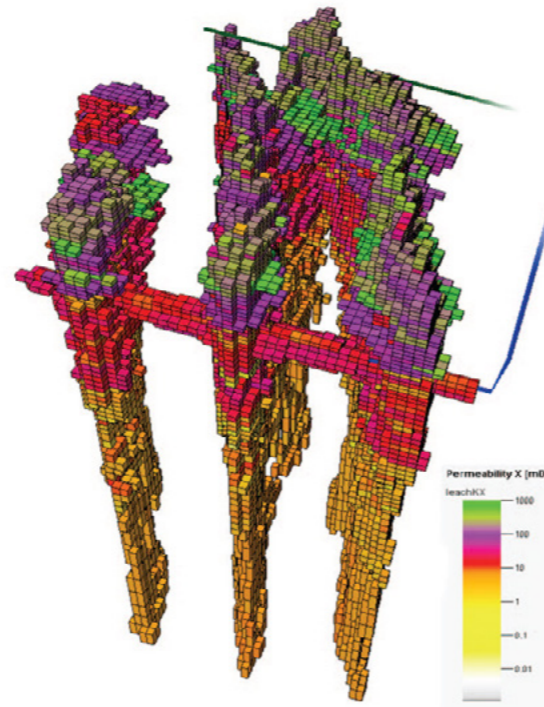
The course content is organised around the following:

- Model purpose
- Elements and architecture
- Probability and determinism
- Multi-scale modelling
- Uncertainty-handling

In case there is no opportunity to access the outcrops directly, the course has also been delivered using a client's core store material (virtual or actual), or online using outcrop video and outcrop graphic material ('Facilitated Online Learning')

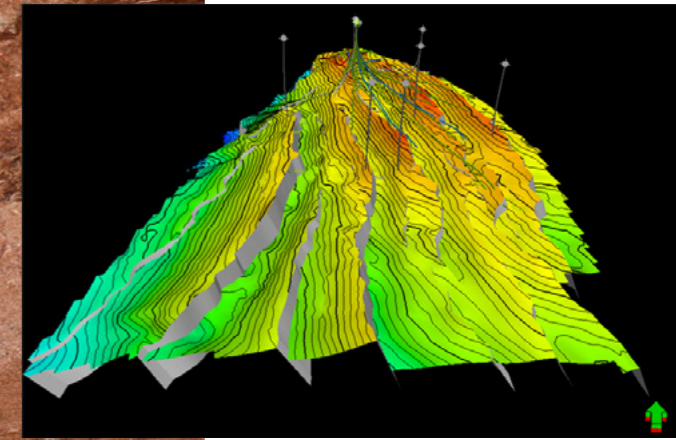
Duration:

4 days, or flexed to suit client needs.



R20 Structural models from seismic data

The course is as applicable to interpreters, and reservoir modellers as it is asset evaluation manager who need awareness of confidence in the output.



 
Douglas Paton

Why the uncertainty in your structural model really does matter.?

With the advent of extensive 3D data it is all too easy to determine top reservoir horizon from well picks, autopick and generate a structure map. Once generated this is then used in the first instance to generate a prospect and then subsequently as the input into reservoir modelling. Despite being fundamental in volumetric determination and prediction of fluid migration, the uncertainty, and inaccuracy, in this structure map is often underestimated.

Recent advances of automated fault picking in part reduces the time taken to generate structure maps and corresponding fault networks, which can reduce this uncertainty, but all interpretation still needs to be QC'd and be sensible. Critically, these advances still require the interpreter to understand both fault behaviour and impact on reservoir distribution and integrity.

The central theme of this event is construction of robust structural models and develop an understanding and appreciation of the uncertainties within them and how to evaluate multiple scenarios.

Course Content:

The course content is organised around the following:

- Data interpretation and conditioning
- Determination of structures controlling reservoir distribution or integrity
- High confidence fault picking and initial fault model
- Application of fault statistics to fault models
- Addressing uncertainty in fault models and consideration of lower confidence, sub-seismic resolution features
- Impact of faulting on fluid migration

The scope of the course is flexible depending upon the client's requirement. The primary course will provide an overview across all tectonic settings and include both 2D and 3D data types with applicability at prospect and reservoir scales. The course can be more specifically tailored for extensional or contractional systems, and prospect generation or reservoir modelling.

Duration:

4 days, or flexed to suit client needs.

MC07 Field Development Planning

All petroleum engineers, drilling engineers, team leads and managers involved in field development planning.

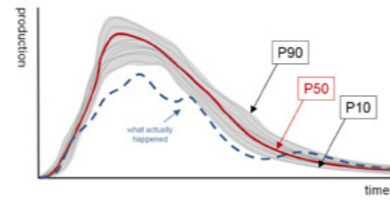
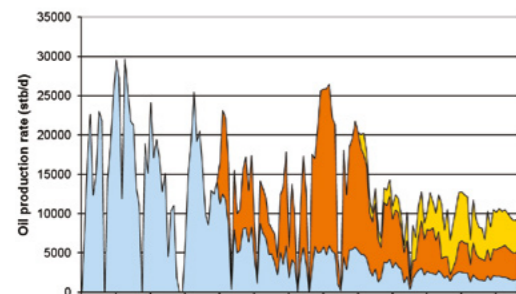


Mark Cook, Mark Bentley

Field Development Planning is conducted by all oil and gas operators with outcomes that often differ widely from predictions.

Occasionally, developments are simply unsuccessful; one independent industry body rates over 65% of FDPs as 'failures'. Why is this so?

This event takes case study material and explores the root causes of success and failure in development planning. It will be argued that failure is rarely due to lack of raw engineering talent and tends to relate instead to issues of framing, planning, team behaviour and both personal and corporate bias.



This course will explore these issues with reference to case study material and will discuss the following topics.

Context: how does FDP work fit into a gated process? This section ideally references the processes specific to the delegates' company.

Project framing: what to include in framing sessions and what not to expect. How to realise Front End Loading in practice.

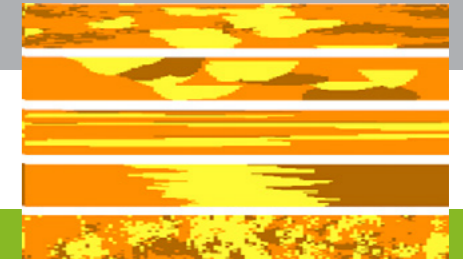
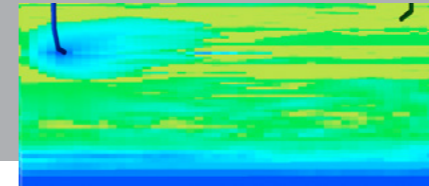
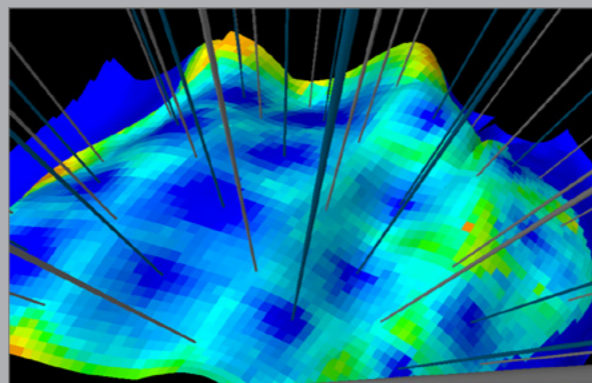
Handling risk and uncertainty: what we mean by 'scenario', how to handle statistics and the perils of the base case. Defining upsides and downsides and mitigating potential loss.

Team organisation: balancing linear vs. parallel working and what to do with Gantt charts.

Sources of bias: predictable heuristics, what they are and how to manage them.

Case examples: post-mortem on unsuccessful FDP outcomes. These may include client-specific cases if desired.

Duration: 4 days, or flexed to suit client needs.



MC03 How to Make a Good Reservoir Model

The course is designed for anyone interested in better quality reservoir models; those involved in building them, using them or managing teams who make them.



Mark Bentley

How can you tell the difference between a 'good' reservoir model and a 'bad' one?

This one day Master class is designed to draw out the common reasons for 'good' and 'bad' outcomes, under the premise that models add value only when they add clear value to business decisions.

The 'red thread' through the event will be the over-riding issue of model design and the five areas of common error: model purpose, selection of elements, use of determinism and probability, model scale and uncertainty-handling.

Advice will be given on how to review models, what questions to ask the model builders and how to determine whether the output from models can be relied upon and used to support decisions.

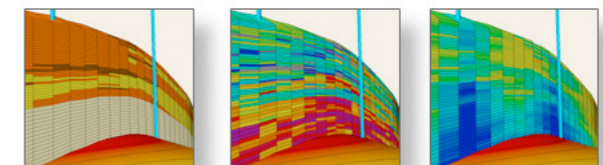
As a take-away the course will close with a set of questions to ask yourself and others, suitable for reference in peer reviews or assists.

Duration: 1 day

Course Content:

Five reasons why many models fail, and how to avoid them:

1. Model Purpose
Why model at all? What do we understand by 'fit-for-purpose'?
2. Elements & Architecture
Getting the building blocks right.
3. Determinism and probability
Concept-driven (intuitive) geostatistics; balancing probabilistic and deterministic tools, the importance of trends.
4. Scaling
Beyond upscaling - pitching the models at the correct scale, multi-scale modelling and the REV.
5. Uncertainty
Overcoming heuristics and modelling what you don't know.



EP07 Mature Field Management

The course is designed for petroleum engineers, geoscientists, facilities engineers, commercial staff and other disciplines who expect to play a part in evaluating, screening and maturing oil and gas field development opportunities. The course is most effective when delivered to a mixed discipline group.



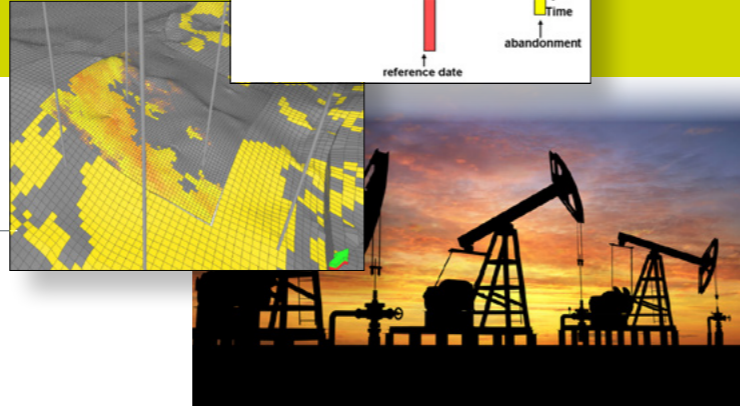
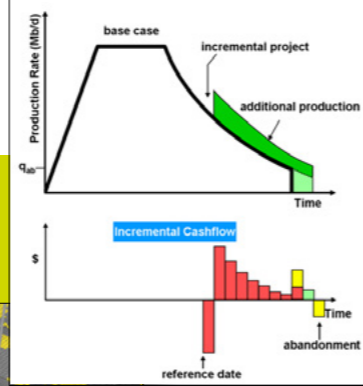
Mark Cook, Mark Bentley, Jerry Hadwir

The course is designed to give participants an appreciation of the evaluation and planning activities associated mature oil and gas field management.

Mature fields differ from green field developments in that major infrastructure is in place, static reservoir data has accumulated from development drilling and a growing volume of production and processing performance data has become available. Decisions therefore relate to incremental projects, which may be small in scope and are often economically marginal. A firm understanding of the technical fundamentals associated with reservoir, wells and surface facilities is therefore required to make quality decisions in this environment, supported by realistic uncertainty ranges, and consistent application of incremental project economics and risk analysis. Various strategies may be considered to manage the mature asset, from harvest to divest, and the selected incremental activities should support a clear chosen strategy.

This course takes groups through these issues, fills any knowledge gaps in the essential technical fundamentals required for mature field development planning in support of a chosen strategy. Course content follows a red-thread TRACS case study, based on real field data, and if requested, the client's specific field data can be adopted to create an asset focused event.

Duration: 5 days, or flexed to suit client needs.



Course Content:

- Contrasting approaches to green and brown field development
- Overview of strategic options for mature field management
- Reviewing field management to date
- Forecasting the No Further Activity (NFA) case
- Managing the base production profile
- Locating the remaining oil (LTRO) in the reservoir
- Improving reservoir recovery
- Improving well performance
- Identifying options to improve surface facilities performance
- Feeding the hopper with incremental project opportunities
- Dealing with uncertainty and risk
- Economic evaluation of the incremental activity opportunities
- Building production skins on to the base production profile
- Making asset management decisions to support the strategy



R03 Geological Interpretation of Well Logs

The course is aimed towards geoscience professionals who are starting to familiarise themselves with logs and wish to use log data to further enhance their evaluations. Additionally, the course will provide an excellent refresher for more experienced geoscientists as well as engineers..

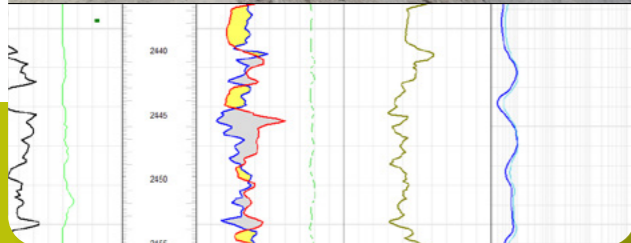


Jenny Garnham

This course introduces the principles of qualitative applications of open-hole well logs for the subsurface professional.

It is designed to demonstrate how single logs, combined logs and supporting data can be integrated and used to understand mineralogy, lithology, depositional environments and key stratigraphic surfaces or events. A generic approach enables the principles and workflows to be applied to modern logs as well as older legacy data.

The course uses a combination of lectures and exercises using real data to build an understanding of the merits and pitfalls of individual logs. The course progresses to use a combination of logs to build a geological evaluation of a well and ultimately a correlation scheme(s).



Specific learning objectives are:

- Appreciate the functions, physical principles and limitations of logging tools used in a standard logging suite and their role in understanding the geology
- Understand the similarities differences between logs acquired using wireline conveyance downhole and those acquired whist drilling (LWD) and data from different vintage
- Use well logs to identify lithology and interpret facies in addition to stratigraphic and structural features
- Analyse well logs in conjunction with core and other well data to produce a coherent geological evaluation of a well
- Use the well log data to build a geological correlation
- Perform a quicklook petrophysical analysis of Vshale, Porosity and water saturation
- A basic understanding of image and dipmeter log interpretation
- Appreciate the limits and uncertainties of the workflows used

Duration

5 days, or flexed to suit client needs.

R16 Geomechanics

This course is designed for geophysicists, geologists, petrophysicists petroleum engineers, reservoir engineers, drilling engineers and production engineers.



Tim Wynn

Reservoir geomechanics (or rock mechanics) can mean many things to many people and these different perceptions can lead to gaps in knowledge and misunderstanding between different disciplines.

In this course we introduce basic geomechanics concepts and processes to provide a level playing field. We also provide examples (with exercises) covering how this knowledge can be applied in the hydrocarbons industry for drilling wells, completion and stimulation designs, reservoir modelling and production / injection simulations..

Course Content:

Theory & Measurement

Basic Theory (with exercises)

- Stress-Strain relationships
- Material Properties
- Mohr circles
- Intact rock failure vs discontinuity reactivation
- Structural geology – natural geomechanics
- Elasticity theory
- Rock physics (acoustic wave propagation)
- Wellbore stress system

Measurement (with exercises)

- Stress tensor
- Pore pressure
- Elastic moduli (from well data and seismic)
- Rock strength (compressive and tensile)
- Friction angle
- Biot factor

Duration: Duration is 4 or 5 days depending on whether it involves one or two trainers and if a field day is included.



Application & Management

Drilling (with exercises)

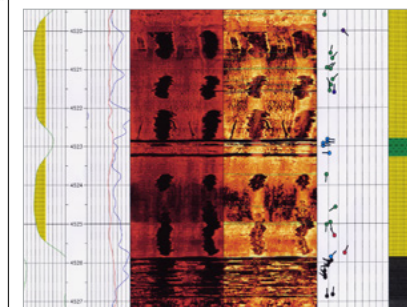
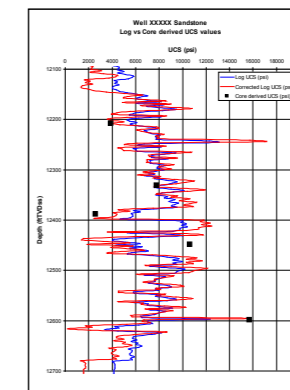
- Wellbore stresses (stress tensor rotation)
- Wellbore stability models (e.g. Mohr Coulomb, Modified Lade)
- Calibration from offset wells (drilling report data)
- Wellbore design examples (anisotropic failure, open natural fractures)

Productivity (with exercises)

- Sand production prediction (empirical and numerical)
- Sand control (completion design, drawdown, depletion and rate constraints)
- Introduction to hydraulic fracture design (2D and pseudo 3D models, proppant schedules)
- Introduction to acid fracture design (2D and pseudo 3D models, diversion control)

Reservoir Performance

- 3D reservoir geomechanical model construction (well data, seismic inversion data)
- 3D Wellbore stability (trajectory screening & optimisation)
- Production effects (compaction, subsidence, fault reactivation, poroelasticity)
- Injection effects (caprock tensile failure, fault reactivation, poroelasticity)
- Naturally fractured reservoirs (fracture compressibility, permeability changes)





Jonathan Bellarby

W04 Completion Design

Designed for completion, workover, well intervention and drilling engineers and anyone involved in the well and completion design process (e.g. production chemists, reservoir engineers and subsea engineers). The course is targeted for persons with general wells and oil / gas industry awareness.

This course is focused at taking a basic awareness of wells and completions and expanding it to cover the design process and all the key decisions that are made in completion design.

The focus is on the overall design rather than the detail of completion equipment from specific vendors. It assumes some knowledge of general well intervention methods (slickline, coiled tubing, etc.), but does not significantly expand this knowledge. The course covers land, platform and subsea wells.

The course is based around the well respected book Well Completion Design, authored by the course presenters.

The course has a mixture of informal lectures, course handouts, videos and exhibits.

The course is practical in nature and has a thread of a practical exercise through the week.

This single exercise is a completion design, where the students, in teams, are expected to design, cost and present the conceptual completion designs for a development scenario.

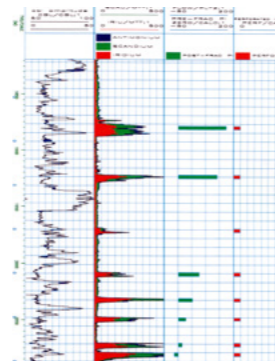
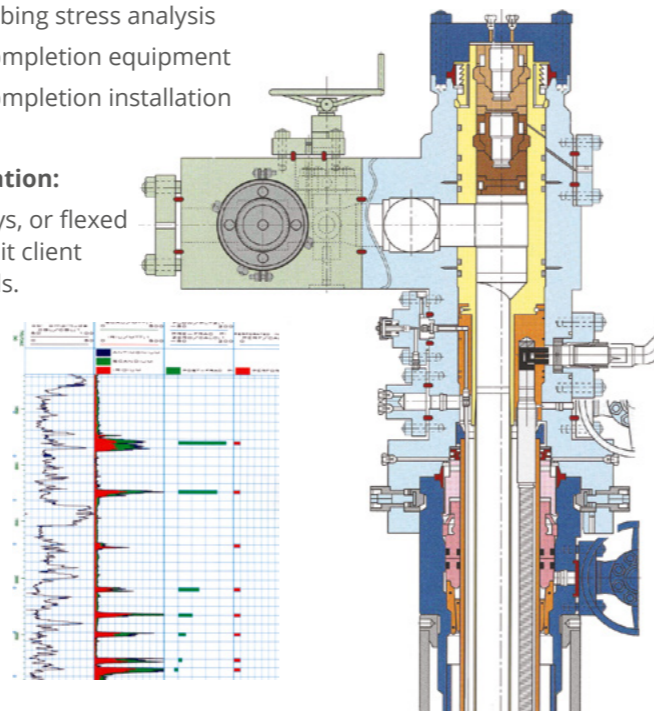


Course Content:

- Types and configurations of completions.
- The completion design process.
- Inflow performance, skin and formation damage.
- Perforating
- Stimulation and impact on completion and flow performance with coverage of modern horizontal multifrac tools.
- Open hole, non-sand control completions including open hole packers and horizontal well clean up.
- Sand control
- Smart completions and multilaterals.
- Tubing sizing, flow estimation and liquid loading.
- Artificial lift
- Production chemistry impacts on completion, prevention and removal
- Metallurgy, corrosion, and erosion;
- Elastomers and plastics
- Tubing stress analysis
- Completion equipment
- Completion installation

Duration:

5 days, or flexed to suit client needs.



We are the only training provider who blends e-learning with bespoke packages for clients in-house, allowing us to significantly cut cost and turnaround time.

Reach

TRACS Training has a global reach. You specify the location, we deliver the course or programme face-to-face or digitally.



Training on six continents. TRACS Training provides in excess of 50 technical and commercial courses to the oil and gas industry.



Maggie Hystad Murison
Training Business Manager
Training programme manager
events lead



Mark Bentley PhD
Training Advisor
Subject matter expert
and lead tutor



Fiona Swapp MA, DipSBA
Lead Graphic Designer
Design and development of course
materials including eProducts



TRACS International Limited

Admiral Court
Poynernook Road
Aberdeen AB11 5QX
Tel: +44 1224 024074

training@tracs.com

 /tracs-international