An Intensive 5 Day Training Course

Clastic Reservoir Characterization and Sequence Stratigraphy

02 - 06 Jul 2017, Dubai

This course is Designed, Developed, and will be Delivered under ISO Quality Standards
Clastic Reservoir Characterization and Sequence Stratigraphy

WHY CHOOSE THIS TRAINING COURSE?

Clastic hydrocarbon reservoirs hold more than 40% of world oil and 60% of world gas reserves. Sandstones provide the best known conventional reservoirs although more and more unconventional tight reservoirs including low porosity and permeability sandstones, siltstones and shales are being exploited for oil and gas production.

The objectives of this training course are to understand the deposition of clastic reservoir sequences and with the use of sequence stratigraphy and integrated stratigraphic analysis to further constrain geological models. Ultimately it can be used to predict and discover more hydrocarbon plays by understanding where to look for these systems tracts in a typical basin setting. These techniques will also be used to improve the estimation of play and prospect risk and to determine what lithology is going to be drilled ahead of the drill bit.

An overview of depositional environments and characteristics of unconventional reservoirs will also be discussed. This PetroKnowledge course will be presented as a 5-day interactive course dealing with the fundamentals of clastic reservoir characterization and the practical and predictive applications of sequence stratigraphy. It will include also exercises and some case histories for some interpretation and workshop discussion.

This training course will feature:

• Clastic reservoir characteristics and depositional environments an introduction.
• An overview of different types of sedimentary basins.
• Clastic reservoir systems tracts, lowstand delta, valley/canyon fill, basin floor fans, highstand and transgressive stands.
• An overview of clastic reservoir petrography, matrix and cements.
• Core and sidewall core analyses, sedimentary logs and integration of log data.
• An overview of petrophysical characteristics of sandstone reservoirs.
• The models and principles of seismic and sequence stratigraphy.
• Sequence definition from wells and seismic.
• Sequence stratigraphy in lacustrine environments.
• Unconventional clastic hydrocarbon reservoirs.
• Integration of other stratigraphic information, biostratigraphical, radiometric dating, chemostratigraphical.

WHAT ARE THE GOALS?

By the end of this training course, participants will be able to:

• Understand what are the different types of clastic hydrocarbon reservoir and the different palaeoenvironments in which they are deposited
• Have a full understanding of sedimentary basin types and their depositional patterns
• Integrate sedimentary core, sidewall core and log data
• Recognize and interpret the petrography of the main clastic reservoir types
• Identify the main sequences on seismic
• Integrate other geological data and then identify sequences and parasequences on well logs
• Converse with the terms and definitions used in sequence and seismic stratigraphy
• Use sequence and seismic stratigraphy towards new play definition and as an aid in play and prospect risking
• Familiarize the different types of unconventional hydrocarbon reservoirs and how these are exploited

WHO IS THIS TRAINING COURSE FOR?

This PetroKnowledge training course is suitable for exploration and development geologists, geophysicists and other upstream subsurface professionals who are interested in understanding clastic reservoir depositional systems and how these can be interpreted in a sequence stratigraphical sense to identify predictive play trends. Its primary use will be for those involved in lead and prospect generation.

www.petroknowledge.com
HOW WILL THIS TRAINING COURSE BE PRESENTED?

The training course will be based around PowerPoint presentations for each module followed by interactive and participative individual and team exercises. There will also be workshop sessions based around real exploration and development case studies to get participants actively involved in the interpretation and characterization of clastic reservoirs and to become aware of the predictive capabilities of applied sequence and seismic stratigraphy. Course participants are also encouraged to bring along sedimentary data, logs and seismic where appropriate from their own companies so that real working examples can be reviewed and interpreted.

DAILY AGENDA

Day One: Clastic Hydrocarbon Reservoirs

Competency Description: To understand what the main conventional clastic reservoirs are in which sedimentary basins they are deposited and how to recognize them visually, from well log data and also petrophysically.

Key behaviours

- Understand what the different basin types are
- Identify the palaeoenvironment of deposition.
- Develop interpretation skills
- Understand numerical methods in the quantification of reservoir quality

Topics to be covered

- Outline and overview
- Sedimentary basins types
- The depositional environments of clastic reservoirs
- Clastic reservoir petrography
- Conventional and side wall core descriptions
- Petrophysical characteristics of clastic reservoirs
- Interpretation and integration of log data

Day Two: Seismic Stratigraphy and Controls on Basin Sedimentary Infill

Competency Description: To understand the principles of sequence stratigraphy and to recognize the geometry of depositional systems to be able to identify seismic sequences and their boundaries.

Key behaviours

- Understand key technical laws and principles
- Identify key aspects of sedimentary sequences
- Interpret sequences from seismic
- Understand the key controls of basin deposition

Topics to be covered

- The Exxon Model and clastic sedimentary sequences
- Principles and the geometry of depositional systems
- Types of seismic reflector terminations
- Changes in accommodation space
- Controls on basin stratigraphy
- Orders of cyclicity
Day Three: The Models and Principles

Competency Description: To be able to recognize sequence and seismic sequence boundaries and all clastic systems tracts and to know where these are developed in a typical shelf to basin profile.

Key behaviours

- Develop key interpretation skills
- Learn how to fully integrate geological and seismic data
- Develop 3D visualization skills
- Able to recognize all of the systems tracts and to know where these develop in a typical shelf to basin transect

Topics to be covered

- Sequence boundary types and systems tracts
- The identification of clastic systems, lowstand deltas, valley/canyon fills, basin floor fans, highstand and transgressive systems tracts
- Other systems tract types and variations on the ideal model
- Genetic stratigraphic sequences
- Sequences on seismic
- Sequence boundary recognition

Day Four: Sequence Definition from Wells and Seismic

Competency Description: To be able to identify key stratal surfaces & sequences on seismic and how to calibrate these by using integrated well log data and recognize seismic facies and how to identify them by using seismic attributes.

Key behaviours

- Develop key seismic interpretation skills
- Develop 3D visualization skills
- Able to recognize all stratal surfaces on seismic and on well logs
- Recognition of internal sequence character using seismic data and how this can be used in exploration

Topics to be covered

- The use of well log data for sequence definition
- Definition of surfaces and systems tracts
- Recognition of systems tracts on seismic
- Recognition of stratal surfaces on seismic
- Seismic facies analysis
- Analysis of seismic attributes

Day Five: Applied Examples of Clastic Hydrocarbon Reservoirs

Competency Description: Development of key integrated seismic and geological interpretation skills using real exploration examples of clastic hydrocarbon reservoirs of different ages and understanding the presence, distribution and viability of unconventional clastic hydrocarbon reservoirs.

Key behaviours

- To develop seismic interpretation skills.
- To develop 3D visualization skills.
- Clastic reservoir characterization and recognizing prospectivity from various basins in Africa, the Middle East and SE Asia.
- To develop well log and integrated geological data interpretation skills.

Topics to be covered

- Reservoir characterization and sequence stratigraphy in the Sirt Basin, Libya
- The Palaeozoic clastic reservoirs of Western Libya
- Clastic reservoir characterization in the Gulf of Suez
- Turbidites and basin floor fans West and South Africa
- Lacustrine clastic reservoirs in the Gulf of Thailand
- Unconventional hydrocarbon reservoirs North America
Clastic Reservoir Characterization and Sequence Stratigraphy

**COURSE DATES, VENUES AND FEES**

<table>
<thead>
<tr>
<th>COURSE DATES, VENUES AND FEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 - 06 Jul 2017</td>
</tr>
<tr>
<td>Dubai</td>
</tr>
<tr>
<td>$4,500</td>
</tr>
</tbody>
</table>

This fee is inclusive of Documentation, Lunch and Refreshments

Please use BLOCK CAPITALS to fill in this form. It is important that you read carefully through all information before starting to complete the form.

**REGISTRATION DETAILS**

Family Name: ____________________________________________
First Name (Mr./Ms.): _________________________________________
Position: ________________________________________________
Company: ____________________________________________________
Mailing Address: _______________________________________________________________________________________________________
Telephone: ______________________ Mobile: _____________________ Fax: ________________________ Email: ________________________

**AUTHORISATION**

Authorisation By: ______________________________________________________________________________________________________
Position: ________________________________________________
Company: ____________________________________________________
Mailing Address: _______________________________________________________________________________________________________
Telephone: ______________________ Mobile: _____________________ Fax: ________________________ Email: ________________________

**IN-HOUSE TRAINING**

Maximize your training budget and have several members of your staff, who require specific training, to attend with the advantage of not incurring additional travel costs when attending a ‘public’ training courses & seminars.

Would you like a PetroKnowledge training course delivered at a time or location to suit you? Would you like PetroKnowledge to tailor a course from our comprehensive library of programmes? Or would you like us to create an entirely new, bespoke course to suit the exact needs of your organisation?

Working in partnership with our clients, PetroKnowledge provides an enjoyable, creative learning experience that enables participants to develop their skills and knowledge. We can deliver not only generic, off-the-shelf courses from our extensive learning portfolio, but we can provide tailored as well as bespoke learning on any aspect of skill development or knowledge. Our in-house courses are conducted by the same expert trainers who conduct PetroKnowledge public courses so you can be assured they will fulfill the learning objective of any organisation.
BOOKING TERMS & CONDITIONS

Booking

• Bookings for courses can be made via our website (petroknowledge.com) or by contacting our Registration Desk on +971 2 5577 389 or at reg@petroknowledge.com
• For on-line bookings, please select the course that you require and click on the “Register Now” button, following the instructions step by step
• Upon receipt of booking in order, enrollment on the respective training course will be confirmed by Registration Team with all necessary documentation

Invoicing and Payment

• Our fees include course presentation, relevant materials, physical & digital documentation, lunch and refreshments served during entire training. Accommodation charges are not included in the course fees
• Course fees are payable upon booking unless a valid, authorized Purchase Order is provided and accepted
• Invoices will be sent via email/courier to the ID/name and address provided
• We prefer to have the fees payment in our account before the start of training course. However, if your company has a different payment policy, the same should inform us in advance
• The currency of fees is in US Dollars (USD). Payments can be made in USD or UAE local currency AED (Arab Emirates Dirhams) either by Bank Transfer or by Credit Card. Our Bank Account details will be provided on the Invoice
• Please note that we do accept payment by cash, in USD or AED, only for the last minute bookings

Cancellation of Courses

• It may be necessary for PetroKnowledge to amend or cancel any course, course times, instructors, dates or published fees due to unforeseen circumstances and we reserve the right for such changes
• Any amendments will be advised before the course start date and any bookings already paid in full will not be subject to increased fees

Cancellation by Client

• Once you have completed your booking, received your confirmation of enrollment and a dated payment Invoice, you are deemed to have a contract with PetroKnowledge. You reserve the right to cancel this contract given the below terms
• All cancellations must be received in writing at reg@petroknowledge.com and info@petroknowledge.com at least 14 days prior to the training
• After the cancellation period has expired, consideration may be given, on a case to case basis, if a registered delegate nominates a substitute on the same course, shifts to next session of the course or moves to a new course
• For a cancellation request made on or before the statutory 14 day cancellation period, a refund may be given or a credit note issued which can be used against future course fees
• A 25% administration fee (of the total course fee at the time of booking) will be charged for any cancellations made outside of the statutory cancellation period

Attendance Certificate

• The daily course schedule should be accurately followed to ensure undeterred implementation of our training
• All delegates, who participated in their course throughout, will receive the Certificate of Completion on the last day
• Please report any foreseeable absences to a PetroKnowledge representative or to your sponsors directly
• An absence of three (3) or more sessions of the course will invalidate your eligibility for the Certificate of Completion