Petrophysics in Unconventional Reservoirs

Petrophysical approaches to the evaluation & interpretation of Unconventional Reservoirs
27th October 2014 - 31st October 2014, Kuala Lumpur, Malaysia

Petrosync Distinguished Instructor

Mr. Mourad B. Wassef
Founder, Petromina Energy Group
Independent Consultant

- Over 23 years of experience in Oil & Gas industry
- Specializes in petrophysics, petroleum geology, electric logging & production logging interpretation
- Handled projects, consultancy and positions in MB Petroleum, CNPC, Indusmin Energy & CoreLab

Course Objectives

- Learn overview of all unconventional reservoir types
- Understand geology of tight gas
- Knowledge on gas extraction concept
- Geochemistry of unconventional resources
- Assessment of Total Organic Content (TOC)
- Learn special coring and core analysis techniques
- Know wireline and mud logging of unconventional reservoirs
- Approaches to get petrophysical parameters and their calculations
- Know how to get gas-in-place and reserve and flow potential estimates
- Understand geomechanics and fracturing

Specially Designed for

The course is designed for petrophysicists, geoscientists, geochemists, geo technicians, geo modelers and other disciplines such as geologists, geophysicists and reservoir, petroleum and drilling engineers whose job requires more knowledge and are involved with the evaluation and exploitation of all types of unconventional reservoirs.
Course Overview

Unconventional oil is petroleum produced or extracted using techniques other than the conventional (oil well) method. Oil industries and governments across the globe are investing in unconventional oil sources due to the increasing scarcity of conventional oil reserves.

While conventional natural gas streams from the earth relatively easily, unconventional gas finds are more difficult to develop and more costly to produce. As technologies and skills improve, unconventional gas is a variable concept because some finds may become more easily or economically produced over time, no longer making them unconventional. Right now, there are six main types of unconventional gas, including deep gas, gas-containing shales, coalbed methane, geopressurized zones, Arctic and subsea hydrates, and tight gas.

Petrophysics is central to the integration of a wide spectrum of related geoscience and engineering disciplines. The course will cover the petrophysical approaches to the evaluation of Shale Oil, Tight Gas Sands, and Shale Gas reservoirs using wireline logging & log analysis, coring & core analysis, petrophysics, geophysics, geochemistry, rock mechanics, and reserve estimation. Attendees will learn basic interpretation procedures to determine porosity, hydrocarbon saturation, TOC, volumes of in-place hydrocarbons, recoverable hydrocarbon estimates.

Instructor Profile

Mourad B. Wassef is a geologist and petrophysicist with over 23 years of experience in oil and gas exploration, development, and training. His principal areas of expertise are petrophysics, petroleum geology of carbonate and clastic reservoirs, Electric logging as well as Production logging interpretation. He handled several exploration services including Shale Gas and Oil in Jordan. Mourad received his BS degree in Geology from Cairo University of Egypt. After a long career with Core Laboratories, he founded Petromina Energy Group in 2000.

Along his career Mourad assumed several roles as Petroleum Geology Consultant for Austin, TX, USA based GLG in Cairo and MB Petroleum in Sultanate of Oman. He served as Operations Chief Officer for Indusmin Energy, as well as Production Services Supervisor, Wellsite Geologist and Core analyst with Core Laboratories. He served as an instructor of various petroleum courses including Electric Open hole logging, Cased hole logging, Petrophysics, Overpressure detection, Petroleum systems and petroleum economics in Egypt, Syria, and Sultanate of Oman.

He issued more than 50 reports about Petroleum Geology and Upstream Oil industry in Africa (Angola, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, Kenya, Madagascar, Mauritania, Mozambique, Namibia, Niger, Nigeria, Sudan, Tanzania, Tunisia) as well as in Brazil. His reports covered exploration and production services as well as Petroleum systems and asset evaluation in Egypt, Tunisia, Yemen, Thailand, Papua New Guinea, and Philippines.

PROGRAM SCHEDULE

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<th>Time</th>
<th>Session</th>
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<tr>
<td>08:00 – 09:00</td>
<td>Registration (Day1)</td>
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<tr>
<td>09:00 – 11:00</td>
<td>Session I</td>
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<tr>
<td>11:00 – 11:15</td>
<td>Refreshment &amp; Networking Session I</td>
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<td>11:15 – 13:00</td>
<td>Session II</td>
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<td>13:00 – 14:00</td>
<td>Lunch</td>
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<td>14:00 – 15:30</td>
<td>Session III</td>
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<tr>
<td>15:30 – 15:45</td>
<td>Refreshment &amp; Networking Session II</td>
</tr>
<tr>
<td>15:45 – 17:00</td>
<td>Session IV</td>
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<tr>
<td>17:00</td>
<td>End of Day</td>
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Overview of all unconventional reservoir types
- Deep Natural Gas
- Tight Natural Gas
- Shale Gas
- Oil Shales
- Coalbed Methane
- Geopressurized Zones
- Methane Hydrates

Geology and reserves of unconventional reservoirs in
- India
- China
- Australia
- New Zealand
- Indonesia
- Pakistan

Gas and Oil Extraction concept
- Fracking (Shale & tight gas)
- Pumping water out (CBM)
- Hydrocracking (Oil Shale)

Geochemistry of unconventional resources
- Organic material in Oil Shale
- Type of Production in each unconventional type
- Total Organic Content (TOC) basics, uses, determination
- Kerogen Maceral types and classification
- Van Krevelen diagram
- Thermal maturity - Vitrinite Reflectance
- Pyrolysis
- Oil Shale geochemistry and geochemical parameters

Geochemistry of unconventional resources
- S1, S2, S3 and Geochemical logs

Special coring and core analysis techniques
- Fabrics, micro fabrics and micro cracks
- Core handling
- Retort and Dean Stark Fluid extraction measurements
- Porosity

Permeability (Pressure decay & Pulse decay methods)
Relative Permeability
Capillary Pressure Measurements

Wireline in unconventional reservoirs
- Spectral Gamma Ray
- Density log
- Sonic Log
- Resistivity log
- Neutral log
- Oil Yield calculation (Spreadsheet will be provided)

Mud logging and gas ration analysis (Haworth Ratios)

Gas-in-place and reserve and flow potential estimates
- Arps empirical Model
- Log duration linear Flow
- Valko "Power Law" Model
- Duong model

Practical Exercises

Geomechanics and fracturing
- Matrix behavior
- Stress sensitivity
- Rock Anisotropy and effect on wellbore stability
- Compressive Strength
- Low permeability
- Conventional vs. Unconventional Geomechanics

Case Study:
"Characteristics of continental oil shale and oil shale resources in China"

Course Exam

IN-HOUSE SOLUTIONS
SAVE COST • IMPROVE PERFORMANCE • REDUCE RISK
PetroSync understands that in current economic climate, getting an excellent return on your training investment is critical for all our clients. This excellent training can be conducted exclusively for your organization. The training can be tailored to meet your specific needs at your preferred location and time. We will meet you anywhere around the globe.

If you like to know more about this excellent program, please contact us on +65 6415 4502 or email general@petrosync.com
27th - 31st OCTOBER 2014, Kuala Lumpur, Malaysia

INVESTMENT PACKAGES

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<th>Investment Package</th>
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<tr>
<td>Standard Price</td>
<td>24th Oct 2014</td>
<td>SGD $ 5,995</td>
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<tr>
<td>Early Bird Offer</td>
<td>26th Sep 2014</td>
<td>SGD $ 5,795</td>
</tr>
<tr>
<td>Group Discount (3 or more Delegates)</td>
<td>24th Oct 2014</td>
<td>10% discount for groups of 3 registering from the same organization at the same time</td>
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Group Discount is based on Standard Price

* To enjoy the promotion & discount offer, payment must be made before deadline
* For 7 or more delegates, please inquire for more attractive package.
* Prices include lunches, refreshments and materials. Promotion & discount cannot be combined with other promotional offers.
* Important: Please note that registration without payment will incur a SGD 200 administration fee.

DELEGATES DETAILS

1st Delegate Name ___________________________ Mr  Mrs  Ms  Dr  Others
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

2nd Delegate Name ___________________________ Mr  Mrs  Ms  Dr  Others
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

3rd Delegate Name ___________________________ Mr  Mrs  Ms  Dr  Others
Direct Line Number: ___________________________ Email: ___________________________
Job Title: ___________________________ Department: ___________________________
Head of Department: ___________________________

INVOICE DETAILS

Attention Invoice to: ___________________________
Direct Line Number: ___________________________ Fax: ___________________________
Company: ___________________________ Industry: ___________________________
Address: ___________________________ Postcode: ___________________________
Country: ___________________________ Email: ___________________________
Please note:
- If you have already registered by Phone  Fax  Email  Web
- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

- By Credit Card:
  - Please debit my credit card:  Visa  MasterCard  AMEX
  - Security Code: ________
  - Card Number: ________ Expired Date: ________

- By Direct Transfer:
  - Please quote invoice number(s) on remittance advice

PetroSync LLP Bank details:
- Account Name: PetroSync LLP
- Bank Number: 7144 • Branch Code: 013 • Account No: 13-1-005531-6
- Name of Correspondent Bank: Standard Chartered Bank, 6 Battery Road, Singapore 049909
- SWIFT Code of Correspondent Bank: SCBLSGSGXXX
- All bank charges to be borne by payer. Please ensure that PetroSync LLP receives the full invoiced amount.

Course Confirmation

I agree to PetroSync’s terms & conditions, payment terms and cancellation policy.

Authorized Signature: ___________________________

PAYMENT TERMS: Payment is due in full at the time of registration. Full payment is mandatory for event attendance.