

AVO, Attributes & Inversion Principles & Applications



28 May – 1 June 2012
Kuala Lumpur, Malaysia



Expert Course Trainer:
Dr. James J. Willis

petroEDGE
www.petroedgeasia.net

petroEDGE® is proud to be the MEDIA PARTNER for

 **cippe** 2012
Beijing

23-24 April 2012,
Kuala Lumpur, Malaysia

PGCE 2012
Petroleum Geoscience Conference & Exhibition

CPD
MEMBER
The CPD Certification
Service
Collective Mark

 **energy**
INSTITUTE
APPROVED TRAINING PROVIDER

AVO, Attributes & Inversion

Principles and Applications

28 May – 1 June 2012 Kuala Lumpur, Malaysia

Course Summary

This course provides an understanding of the evolving role of seismic petrophysics through the use of amplitude variations with offset or angle (AVO/AVA), attributes, and inversion techniques. Understanding rock physics and the behavior of the propagating seismic waves represents an integral part of the course, especially in the context of specific applications including enhanced seismic interpretation, rock and fluid characterization, including hydrocarbon identification and quantification, fracture identification, and stress/geomechanical analysis. Course concepts are enhanced by numerous practical exercises and case studies.

You Will Learn:

- The fundamentals of seismic wave propagation and specific attributes of seismic measurements toward enhanced interpretation and petrophysics;
- The benefits and cons of various attributes in various facets of investigation, including stratigraphy/sedimentology, structural geology and geomechanics, and seismic petrophysics;
- How to determine elastic properties from AVO/AVA analysis for fluid and lithologic discrimination;
- How to integrate well data through seismic inversion techniques; and
- The role of seismic attribute analysis and related techniques in understanding risk elements from exploration, drilling and completion, and development stages.

Course Outline:

Day 1

- Introductory Exercises
 - Interpretation Exercises
- Review of the Seismic Process
 - Review of seismic fundamentals, including rock physics and aspects of propagating seismic waves
- General Seismic Interpretation
 - Review of seismic interpretation techniques

Day 2

- Seismic Attributes
 - Seismic attribute analysis, including discussion of various attribute types and multi-attribute analysis.
- AVO Analysis
 - An in-depth investigation into amplitude versus offset (angle) analysis, including fundamental principles, applications, and pitfalls.

Day 3

- Borehole Seismology
 - Borehole seismic measurements and techniques, and integration into the seismic petrophysical investigations
- Seismic Inversion
 - Examination of techniques and benefits of seismic inversion, including prestack (elastic) versus poststack inversion, deterministic versus stochastic (probabilistic) inversion, and resultant products, including extraction of physical rock and fluid properties.

AVO, Attributes & Inversion

Principles and Applications

28 May – 1 June 2012 Kuala Lumpur, Malaysia

Day 4

- Enhanced Sedimentologic/Stratigraphic Interpretation from Seismic Attributes
 - Extracting more information of the sedimentologic/stratigraphic system, including wavelet versus layers, seismic geomorphology, intraformational variations and facies analysis, and 3D Wheeler diagrams.
- Enhanced Fault Interpretation from Seismic Attributes
 - Extracting more fault information from seismic data by understanding and utilizing specific attributes for enhancing structural interpretations, from regional studies to role in reservoir characterization, including timing and geometry, seal characteristics, etc.

Day 5

- Seismic Anisotropy Analysis
 - Fracture ID—Seismic anisotropy analysis and fracture mapping from seismic data, and integration with other datasets, such as image log and core data.
 - Stress Analysis from Seismic Data—Extraction of stress data for prospect seal risking, wellbore stability investigations, and reservoir behavior during production.
- Reservoir Characterization and Understanding Risk
 - Summary discussion of the role of seismic data and analysis in integrative studies (well, core, other datasets) to understand better the reservoir properties and behavior and risk uncertainties from exploration and prospect generation, through drilling and completion, to field development and enhanced recovery.

Days 1-5

- Case Studies
 - Case Study 1: Reservoir Continuity or Not, Gulf of Mexico
 - Case Study 2: Sand Probability, North Malay Basin
 - Case Study 3: Fluid/Lithology Discrimination, Gingin West Field, Perth Basin, Australia
 - Case Study 4: Fractured Basement, Muara Bulian Field, Indonesia
 - Case Study 5: Structural/Stratigraphic Interpretation, Badger Basin Field, U.S. Rocky Mountains
 - Case Study 6: Porosity Prediction from Seismic Data
 - Case Study 7: Attribute Analysis, Deepwater Gulf of Mexico
- Exercises
 - Numerous hands-on exercises throughout the course to enhance understanding of key concepts and topics.

AVO, Attributes & Inversion

Principles and Applications

28 May – 1 June 2012 Kuala Lumpur, Malaysia

petroEDGE

About your Expert Trainer



James J. Willis received his B.S. and M.S. degrees in Geology from the now University of Louisiana-Lafayette in 1989 and 1990, respectively, and his Ph.D. as a National Science Foundation fellow at Baylor University, Waco, Texas, in 1993. From 1994-1996, he studied planetary tectonics as a NASA-funded postdoctoral fellow at Southern Methodist University. In 1996, he returned to UL-Lafayette, where he was awarded in 1997 the Hensarling-Chapman Endowed Professorship in Geology. He is a Professional Geologist, registered with the Texas Board of Professional Geoscientists. James has been the editor and publisher (both volunteer efforts) for the Lafayette Geological Society since 2002.

James has been an active researcher, receiving several million dollars in grants from federal, state and industry sources, has presented numerous talks, and has published on a diversity of geoscience topics. In particular, as an undergraduate student he developed a 4D quantitative well bore guidance theory, including the concept of positive versus negative thickness (sign indicating direction of drilling section), that predated availability of key real-time data. As an independent trainer and consultant for Baker Hughes INTEQ for the last year and a half, it has been particularly exciting to see just how far the reality of LWD technology, especially azimuthal imaging, has since advanced.

Hear what other's have said about James Willis's classes in 2009/10/11 in Kuala Lumpur:

- ❖ "A very good class; full of new information. Recommended for a newcomer in Petrophysics!"
- ❖ "I really enjoyed the course. Thanks!"
- ❖ "One of the best training attended – very knowledgeable, well presented and great materials"
- ❖ "I got a lot of knowledge attended this course"

Carigali Hess Operation Co., Eaglewood Energy (BVI), Offshore Geo-Surveys, Petronas Carigali (XCM) Exploration Capability Management, Mitsui Oil Exploration, Newfield Sarawak Malaysia and many others.

Feedback from James's international past attendee's around the world.

- ❖ "All well-presented! Great material!"—Log Analysis, PathFinder LWD.
- "Better than excellent. Need more courses with you as instructor."—MWD Supervisor, Baker Hughes INTEQ.
- ❖ "Perhaps the best speaker I've ever heard."—Petrophysicist, Anadarko.
- ❖ "This is one of the best courses I've ever taken. ... Thanks!" Operations Engineer, Pioneer Natural Resources
- ❖ "This course was very informative. I received great insight to the theory behind different log measurements."
Drilling Engineer, Apache Corporation
- ❖ "Great analogies, very energetic" Petroleum Engineer, Chevron
- ❖ "The speaker was very knowledgeable and communicated very effectively." Geologist, ENI

petroEDGE

The core competencies of professionals in the Oil & Gas industry are constantly evolving. To meet this ever growing gap, PetroEdge provides targeted up- to-date, practical and technically sound training solutions that enable professionals to be continuously relevant in industry.

Visit www.petroedgeasia.net email us at info@asiaedge.net or call +65 6741 9927

petroEDGE® is proud to be the MEDIA PARTNER for



Learn more about our Strategic Learning Solutions for Oil & Gas
Call +65 67419927 or email info@petroedgeasia.net
www.petroedgeasia.net

REGISTRATION FORM

AVO, Attributes & Inversion: Principles & Applications Kuala Lumpur, Malaysia	Early Bird Price	✓	Normal Price	✓	TEAM DISCOUNTS!
5 day training course 28 May – 1 June 2012	SGD 4700		SGD 4900		PetroEdge recognises the value of learning in teams. Group bookings at the same time from the same company receive the following: 3 or more at 5% off 5 or more at 7% off 8 or more at 10% All other promotions including early bird are exclusive of the group discount.
PetroEdge In-house Training					
{ } Yes, I would like to organise this training on-site and save over 20% of total course fees! For further information about On-site Solutions, please call +65 67419927 or email info@asiaedge.net					

DELEGATE DETAILS

Delegate 1:

Mr Mrs Ms Dr Other

Telephone: _____

Job Title: _____

Department: _____

Email: _____

Delegate 2:

Mr Mrs Ms Dr Other

Telephone: _____

Job Title: _____

Department: _____

Email: _____

Head of Department: _____

Company: _____

Address: _____

Country: _____

Postcode: _____

Attn Invoice to: _____

Telephone: _____ Fax: _____

Please note:

- indicate if you have already registered by Phone Fax Email Web
- if you have not received an acknowledgement before the training course, please call us to confirm your booking.
- photocopy this form to register multiple delegates.

Payment Methods:

By Cheque/ Bank Draft: Make Payable to Asia Edge Pte. Ltd.
By Direct Transfer: Please quote AE1 with the remittance advise
Account Name: Asia Edge Pte. Ltd.
Bank Number: 508 Account Number: 762903-001 Swift Code: OCBCSGSG
All bank charges to be borne by payer. Please ensure that Asia Edge Pte Ltd receive the full invoiced amount.

PAYMENT POLICY: Payment is due in full at the time of registration. Full payment is mandatory for event attendance. I agree to Asia Edge Pte Ltd. payment terms

CANCELLATIONS & SUBSTITUTIONS: You may substitute delegates at any time. ASIA EDGE PTE LTD does not provide refunds for cancellations. For cancellations received in writing more than seven (7) days prior to the training course you will receive a 100% credit to be used at another ASIA EDGE PTE LTD training course for up to one year from the date of issuance. For cancellations received seven (7) days or less prior to an event (including day 7), no credits will be issued. In the event that ASIA EDGE PTE LTD cancels an event, delegate payments at the date of cancellation will be credited to a future ASIA EDGE PTE LTD event. This credit will be available for up to one year from the date of issuance. In the event that ASIA EDGE PTE LTD postpones an event, delegate payments at the postponement date will be credited towards the rescheduled date. If the delegate is unable to attend the rescheduled event, the delegate will receive a 100% credit representing payments made towards a future ASIA EDGE PTE LTD event. This credit will be available for up to one year from the date of issuance. No refunds will be available for cancellations or postponements.

ASIA EDGE PTE LTD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. ASIA EDGE PTE LTD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, unforeseen occurrence or any other event that renders performance of this training course impracticable or impossible. For purposes of this clause, a fortuitous event shall include, but not be limited to: war, fire, labor strike, extreme weather or other emergency.

PROGRAM CHANGE POLICY: Please note that speakers and topics were confirmed at the time of publishing; however, circumstances beyond the control of the organizers may necessitate substitutions, alterations or cancellations of the speakers and/or topics. As such, ASIA EDGE PTE LTD reserves the right to alter or modify the advertised speakers and/or topics if necessary. Any substitutions or alterations will be updated on our web page as soon as possible.

ASIA EDGE PTE. LTD.

Company Registration No: No. 200710561C
Copyright © 2005 ASIA EDGE PTE LTD. All rights reserved. This brochure may not be copied, photocopied, reproduced, translated, or converted to any electronic or machine-readable form in whole or in part without prior written approval of ASIA EDGE PTE LTD

4 Easy Ways to Register

Online: www.petroedgeasia.net

Email: info@asiaedge.net

Phone: (65) 67419927

Fax: (65) 67478737

Learn more about our Strategic Learning Solutions for Oil & Gas

Call +65 67419927 or email info@petroedgeasia.net

www.petroedgeasia.net