INDONESIAN PETROLEUM ASSOCIATION
Professional Division Committee

ADVANCE SEISMIC METHODS FOR FIELD EXPLORATION & DEVELOPMENT

Dates : December 14-18, 2009 (5 day course)

Instructor : Dr. Sigit Sukmono
Institute Technology Bandung (ITB)
Department of Geophysical Engineering

Venue : Sheraton Senggigi Beach Resort Lombok, Indonesia

Cost : US$ 1,850 (IPA Members)
US$ 1,950 (Others)

Includes: *hotel accommodation for 6 (six) nights, working lunches, refreshments, and airport transfer*

PLEASE REGISTER AS SOON AS POSSIBLE TO THE IPA SECRETARIAT
Indonesia Stock Exchange Buikding - Tower 2, 20th Floor (Suite (2001)
Jln. Jendral Sudirman Kav. 52-53 - Jakarta 12190 - Indonesia
Telephones: (62-21) 515-5959
Facsimile: (62-21) 5140-2545; 5140-2546
E-mail address: **Rini. Kusumastuti@ipa.or.id** or **ipa@cbn.net.id**

WHO SHOULD ATTEND?

Geophysicists, geologists, petroleum/reservoir engineers or managers who are need strong knowledge on reservoir characterizations using seismic techniques.

COURSE DESCRIPTION

In this Course the participants learn to apply various advance seismic methods to solve common problems in field exploration and development. Proper uses of advance seismic techniques can extract information from seismic data that is otherwise hidden and will enhance the capability of predicting, characterizing and monitoring hydrocarbon reservoirs. Seismic attributes analysis is used for advance stratigraphy analysis in reservoir geometry delineation. Advance seismic inversion and AVO are used for reservoir properties description, fluid identification and fracture analysis. Time-lapsed and multicomponent techniques are used for reservoir monitoring and fracture analysis. The combined techniques can assist in better definition of reservoir continuity and flow unit, their physical characteristics and distribution, and to aid the well delineation. Considering the unique seismic characteristics of carbonate reservoirs, specific discussion on the application of the methods to carbonate reservoirs is also provided. The Course comprises of approximately 40% theory and 60% practical exercises.

ABOUT THE INSTRUCTOR

Dr. Sukmono is an Associate Professor in Reservoir Geophysics, Institute of Technology Bandung, Indonesia. He has been teaching numerous seismic classes for oil industry communities in Indonesia as well as overseas, among others, in Russia, Japan, India, Korea, Spain, Italy, Middle-East, Nigeria, Angola, Malaysia, Thailand, Vietnam, etc. He has also authored more than 10 course manuals in reservoir geophysics topics. He has also more than 15 years experience as an advisor and consultant in the field of reservoir geophysics for major oil companies. He received his B.S. in Geology from Institute of Technology Bandung, MSc in Applied Geophysics and Engineering Geology from the Asian Institute of Technology, and DR in Applied Geophysics from institute of Technology Bandung. He is a Member of Society of Exploration Geophysicists, American Association of Petroleum Geologists, Indonesian Petroleum Association, Indonesian Association of Geophysicists and Indonesian Association of Geologists. He was awarded Best Research Award by Minister of Research & Technology in 2002 and by Toray Science and Technology Foundation in 1988, and International Scientific Publication Award from the Minister of Education and Culture in Indonesia in 1988.

COURSE AGENDA

(NOTE: to do exercises, participants need to bring laptop with Microsoft Office Excel program) !

Day 1: Basic Seismic Interpretation and Advance Rock Physics Analysis

- Basic seismic interpretation: steps in seismic reservoir analysis, impedance, reflectivity, phase, polarity, resolution, well seismic tie, pitfall.
- Basic rock physic analysis: stress-strain, velocity, density, modulus, velocity-porosity model, Vp-Vs relation, velocity-density relation.
- Fluid replacement modeling: physical properties of gases & fluids, gases & fluid effects on wave propagation, Batzle-Wang method, Biot-Gassman method, Kuster-Toksoz method.

Day 2: Amplitude Response Modeling & Seismic Inversion

- Amplitude response modeling: convolutional process, matrix operation, modeling for lithology, porosity and pore fluids effects,
- Post Stack AI inversion: principles, strengths & weaknesses, methodology, applications in reservoir characterization.
- Basic of pre-stack AVO inversion (Zoeppritz equation and its approximation, The prediction of AVO response, AVO classification, AVO cross-plot, AVO attributes)

Day 3: AVO, LMR and EI inversion

- AVO modeling, classification, cross-plot, attributes and their applications
- LMR (Lambda-Mhu-Rho) Inversion: The LMR approach, Extracting & Inverting Rp and Rs, Sensitivity analysis, Interpreting Lambda-Rho & Mu-Rho.
- Elastic Impedance Inversion**:** Seismic Lithology Estimation, EI Inversion Steps. Extended Elastic Impedance (EEI) Inversion.
- Application of AVO for Fluid & Fracture Analysis in Carbonate

Day 4: Advance Attribute Analysis

- Amplitude attributes : types (composite amplitude, amplitude ratio, RMS amplitude, etc), physical-mathematical meanings, geological applications
- Complex attributes : types (reflection strength, instantaneous phase, instantaneous frequency, etc), physical-mathematical meanings, geological applications
- Times & frequency attributes : types **(**dip-azimuth, illumination, edge-coherence-variance, curvature, spectral decomposition), physical-mathematical meanings, geological applications

Day 5: Neural Network Multiattributes, Time Lapse & Multicomponent

- Neural Network Multiattributes analysis for lithology and porosity mapping
- Time-Lapse & multicomponent seismic for reservoir monitoring

SHORT COURSE REGISTRATION

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Attendee Name : _____

Company : _____

Telephone/Fax. : _____

E-mail address : _____

Mobile phone no. : _____

Arrival date : _____

Departure date : _____

Contact Person : _____

Telephone/E-mail : _____

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