

Evaluating Reservoir Quality, Seal Potential and Net Pay

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Co-hosted by:



Evaluating Reservoir Quality, Seal Potential and Net Pay (5 Days)

This course demonstrates the use of basic rock properties, wireline logs, capillary pressure and relative permeability data to evaluate reservoir rock quality, seal capacity (thickness of hydrocarbon column a seal can hold before it leaks), recovery efficiency and to determine location of reservoir fluid contacts. It also explains the main controls on fault seals, and methods to quantify risk in evaluating these. This popular course has been presented previously as AAPG, IPA and PESA Continuing Education Short Course as well as comprising part of the internal training program for several major oil and gas companies.

Exploration and development geologists and reservoir engineers will benefit from the straightforward and intuitive presentation of principles governing hydrocarbon migration and entrapment, reservoir quality, pay determination and practical applications to determine fault and top seal potential.

Course Content

1. Introduction

Introduction to evaluation of reservoirs, seals and pay.

2. Basic Principles of Capillary Pressure

Discussion of uses of capillary principles in reservoir evaluation; fundamentals of capillarity: buoyancy vs. capillary pressure; wettability; contact angles; derivation of capillary pressure equations; definition of Free Water Level; description of the mercury injection apparatus.

3. Exercise 1:

Use of capillary pressure data to determine S_w at various heights above the Free Water Level / subsurface depths.

4. Exercise 2

Scenario is that a large structure has been identified by seismic and a well is drilled at the crest. Task is to use given rock properties, structure and capillary pressure data to evaluate reservoir quality of encountered rock types, locate fluid contacts and establish saturations with depth. Also, use these data to determine seal capacity, and assess depths at which each rock type becomes pay.

5. Seal Evaluation (3 Case Studies)

Review concepts of top seal, "sealing" faults, "leaking" faults.

1. Demonstrate application of integrated petrophysical and geochemical techniques in evaluation of seal potential in Talang Akar Fm., offshore NW Java.
2. Details of combining fault analysis, production data and reservoir geochemistry to determine degree of compartmentalisation in Pagerungan Gas Field.
3. Description of seal evaluation in dynamic petroleum systems: example from East Java and Northwest Shelf, Australia

6. Pore Geometry

Discuss the effects of pore geometry (size, shape, distribution of pores and pore throats) on relative permeability and capillary pressure. Relate these properties to amounts, types and rates of fluids produced. Use drainage and imbibition capillary pressure data to evaluate recovery efficiency of reservoirs on primary depletion as well as to judge the distribution of remaining fluids prior to secondary production.

7. Exercise 3

Relate capillary pressure curves to pore geometry. Qualitatively estimate key MICP attributes from rock descriptions; match petrographic images to capillary pressure curves.

8. Net Pay Determination

Review conventional methods of determination of net pay in a reservoir and demonstrate some improved techniques using data from core, sidewall core, cuttings, conventional plug measurements (porosity and permeability) in conjunction with capillary pressure data.

9. Exercise 4

Use available reservoir data and production constraints to predict recovery efficiency; calculate recoverable reserves and evaluate reservoir management options.

10. Exercise 5

Course participants 'risk' their own capital to purchase available data to calculate reserves and evaluate worth of field. Actual data (logs, maps, core, petrography, capillary pressure) from field in offshore NW Java, Indonesia are used to determine net pay.

About The Instructor



John Kaldi is a Professor at the Australian School of Petroleum, University of Adelaide, Australia and Chief Scientist for the Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC). He received a PhD in Geology from Cambridge University, England and then worked for the Saskatchewan Geological Survey in Regina, Canada; with Shell Canada in Calgary; ARCO Oil and Gas Co. in Plano, Texas; ARCO, Indonesia, in Jakarta and VICO in Jakarta. In 1998, he became Director of the National Centre for Petroleum Geology and Geophysics (NCPGG) at the University of Adelaide, and then served as the Inaugural Head of the Australian School of Petroleum (ASP), University of Adelaide. Professor Kaldi is committed to providing continuing education courses for the oil and gas sector and has been teaching courses around the world for numerous Professional societies and oil & gas companies.

John just finished as the AAPG Vice-president (International Regions), has served as President of the AAPG Asia Pacific Region (2002 – 2005) Dr. Kaldi received AAPG's Special Commendation Award for Significant Contributions to Petroleum Geology in 1997, the 2006 AAPG Distinguished Service Award and in 2009 was named an AAPG Honorary Member. He has lectured around the world as an AAPG and SPE Distinguished Lecturer.

Early Bird:

USD \$2,700

Individual:

USD \$2,800

Group Rate:

USD \$2,500

COURSE FEE: This covers the cost of tuition, training materials, certificate, lunch and tea breaks for the duration of training per participant.

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