



Society of Exploration Geophysicists
The international society of applied geophysics

EAGE

EUROPEAN
ASSOCIATION OF
GEOSCIENTISTS &
ENGINEERS

2009 SEG/EAGE Distinguished Instructor Short Course

Petroleum Geoengineering: Integration of Static and Dynamic Models Prof Patrick Corbett, Heriot-Watt University

Overview



This course is designed for a broad range of geoscientist and engineers working in the petroleum industry. The course provides improved linkage between the techniques used at various scales to describe and model petroleum reservoirs. The ultimate objectives are to enable technical staff to maximise the recovery of hydrocarbons. The impact of petrophysical heterogeneity at various scales on the recovery of oil and gas provides the focus for the course.

Summary

1. The course introduction shows how Petroleum Geoengineering concepts have developed along with the requirement for more integrated and synergistic technical teams addressing reservoir development projects
2. The course emphasises the links between the stratigraphic controls on geobody architecture (and properties), the connectivity and the ultimate recovery factors
3. Petrophysical and rock physics properties are measured at a variety of scales. An exercise will explore how averages can be used to determine effective properties at larger scales
4. Reservoir models are built by industry using a range of geostatistical techniques and these require calibration by dynamic measurements at various scales. The role of seismic in modelling is considered at the appropriate stage.
5. Sweep efficiency and recovery factors are determined by scales of lateral and vertical heterogeneity. The use of the Lorenz and Modified Lorenz plots is demonstrated in an exercise to illustrate the importance of internal reservoir architecture in controlling recovery factors
6. The course challenges subsurface teams to consider strategies for improving oil recovery and with the high demand and price to target ever higher recovery factors

Who should attend

The integrated nature of this course means that it is suitable for individuals from all subsurface disciplines (geology, geophysics, petrophysicists, geomodelers, reservoir and petroleum engineers). Additionally the course is very suitable for *teams* of subsurface staff. Managers are encouraged to attend in order to consider technical and organisational aspects of integrated subsurface teams.

(Cont.)

Biography

Patrick W. M. Corbett started in the industry in 1978 at Unocal and worked in various positions in international (United Kingdom, the Netherlands, and Indonesia) exploration and development geoscience. Since coming to Heriot-Watt University in 1989, his research focus has been on the integration of geoscience and engineering through geologic analysis, petrophysical measurement, permeability anisotropy modeling, well test interpretation, dynamic upscaling, and genetic petrophysics.

Corbett graduated with a degree in geology (Exeter University, 1977) followed by an MSc in micropalaeontology (University College London, 1978), a postgraduate Diploma in geological statistics (Kingston University, 1982), a PhD in petroleum engineering and a DSc in petroleum geoengineering (both from Heriot-Watt University, 1993 and 2006, respectively). He is a member of AAPG, EAGE, SEG, Geol. Soc., IAS, PESGB, SCA, SEPM, SPE, SPWLA, a Chartered Geologist, and a Chartered Scientist. He has coauthored the books “Statistics for Petroleum Engineers and Geoscientists” and “Cores from the Northwest European Hydrocarbon Province.”

Corbett was an EAGE Distinguished Lecturer (Petroleum Geoengineering) in 1998 and an SPE Distinguished Lecturer (Integration of Geology and Well Testing) in 1998–99. In 2005, he was awarded the Wegener Medal by the EAGE for the integration of geoscience and geoengineering. Patrick was awarded the 2006 SPE Europe and Russia Regional Technical Award for Distinguished Contribution to Petroleum Engineering in the Area of *Reservoir Description and Dynamics*.



A donation will be made to the United Nations Environment Programme *Plant for the Planet: Billion Tree Campaign* to offset the carbon footprint of Patrick Corbett’s travel related to the 2009 SEG/EAGE DISC tour.

- END -