

Carbonate and Fracture Petrophysics - A Roadmap (Laptop)

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WHO SHOULD ATTEND?

All Petrophysicists, all Carbonate or Fracture Geologists, Engineers and Core Analysts. Anyone involved with the formation evaluation of Carbonates, Fractured or "Complex" reservoirs or who use their petrophysical results. Anyone who loves petrophysics! Basic principles are reviewed, however a years experience in formation evaluation is desirable.

YOU WILL LEARN

- The physical differences between carbonates and clastics and their data response implications.
- Why low porosities, extreme pores, vugs, fractures & oil wetness occur in carbonates and how to recognize & treat them.
- The **essential ingredients and process of a successful Carbonate & Fracture evaluation** and how these differ from Clastics.
- Why well tests (DSTs) are often misleading in fractured reservoirs and what critical other data you must have.
- How to use drilling data, mudlogs, cores, capillary pressure, well tests and special log data.
- The key **Failure Points** which must be identified and healed to achieve cost-effective data acquisition.
- How a Non-Petrophysicist can quickly assess if Carbonate & Fracture (C&F) data and results are Fit for Purpose using "Greenlists".
- The impact of common errors using **real-time Interactive Petrophysics demos** and the author's Excel spreadsheets.
- How to perform **Quick Look Carbonate Log Analysis** using the author's Excel spreadsheet template.
- How to perform **a complete, systematic, integrated evaluation of a Carbonate and Fractured or "Complex" reservoir.**
- How to integrate carbonate capillary pressures with routine core & logs in the author's Excel spreadsheet template.
- How to think laterally about petrophysics and solve problems creatively using all available information

ABOUT THE COURSE [CFP slide example](#) [Testimonials](#)

This course represents **The Complete Carbonate & Fracture Evaluation Recipe**, from **Quick Look Log Analysis** to a full Core-Log-Test integration of modern data. The course explains how drilling data, LWD, conventional & special wireline, routine & special core, MDT and well tests should all be logically used together. **The course establishes a robust template for the optimal data acquisition, integration and evaluation of complex reservoirs and a secure basis for ongoing decisions.**

A clastics style log analysis in carbonates or fracture reservoirs can be completely misleading. Here, petrophysics is dominated by forces unfamiliar to the clastics geoscientist, including diverse pore-geometries and the absence of clays and total porosity as basic controls on reservoir quality. This requires the petrophysicist to think hard if petrophysical results are to provide a secure basis for decisions.

Examples from shallow, permeable carbonates, tight fractured carbonates, tight gas, basement and other complex reservoirs are employed to demonstrate the severe shortcomings of a conventional approach. The physical differences between Clastics and more complex reservoirs are explained in the context of how to achieve the answers we require from conventional logs. The Failure Points which result are highlighted and juxtaposed with the Author's purpose designed "Recipe". Physical characteristics are translated into specific petrophysical uncertainties, then the Drill-Core-Log-Test acquisition and integration process designed to address them is systematically worked through. This course is a condensed learning session of interleaved Theory, Case histories, Excel micro-practicals, Interactive Petrophysics demos, Excel workshops and Movies which highlight the issues and why the Author's Recipe works. A powerful Excel theory/workshop to derive and integrate capillary-pressure Sw's with core and logged resistivity concludes the course. Drilling data, routine and special core, conventional logs, ECS, NMR, Dielectric, Sigma & C:O logs, Sonic scanner, Image logs and MDTs are all briefly explained and assembled together to build an exhaustive "petrophysical recipe" for geo-modeling inputs and reserves. **This course provides a new found confidence and much needed systematic process for staff faced with the daunting prospect of managing complex reservoirs. This process has been adopted and used successfully by a number of operators.**

COURSE CONTENT [Detailed contents](#) (Public courses 5 days. Tailored In-House 3 or 5 days)

- The Physical Characteristics of Carbonate & Fractures. How and why they differ from Clastics
- Carbonate classifications systems vs. Lucia's "rock fabric" approach and application
- Fractured reservoir classification: Nelson, Aguilera
- The Impact of Physical Character on reservoir measurements: drilling, cores, logs, pressures, tests
- Clays + Total porosity vs. Pore geometry + Total porosity. What to do
- How to achieve cost effective data acquisition and the tests you must apply to received data sets
- Misleading data: Logs: GR, rhob, sonic, low Rt, high Rt; NMR; RCA; Well tests; Other
- Useful Data: A comprehensive list of cheap data you already have but have not yet used effectively!
- Powerful Data! A comprehensive list of powerful data which overcomes or circumvents ALL C&F evaluation problems.
- How to ensure your data acquisition program will provide Fit-For-Purpose geo-model inputs.
- Achieving Quick Look, Fit-For-Purpose results: anhydrite, porosity, vugs, m, multiple Sw's, adaptive k, FWL
- Quick Look Fracture Identification (FIL)

- The Complete Carbonate & Fracture Evaluation Recipe

This course explains a logical process of *sequential data integration* to evaluate any Carbonate & Fractured or "complex" reservoir. It presents a **plan of action**, not a passive discussion of problems and theory. Deakin's "Recipe" exploits important drilling data, the latest hi-tech logs, LWD, cores, well tests and explains numerous special techniques to reach a definitive set of results.

- The Recipe: Principles, Basic Questions, Source Data and the Information Flow.
- Multistream m solutions, PetroDB, Analogs, Pulsed neutron (Sigma) logs, Dielectric logs; Capillary pressure Sw, Oil mud core Sw, NMR porosity, Sw, kbrine, Coates equation; Sonic Scanner Stoneley k, Stress and implied fracture sets.
- How to use data and equations intelligently in complex reservoirs - Understanding Redundancy, Data Hierarchy, Equation Inversion.
- Greenlists for logging and petrophysical results prior to their use in reserves or simulation.
- The Petrophysics to Geo-model checks which really matter.
- Re-usable Excel spreadsheet templates for carbonate and complex reservoir Formation Evaluation tasks.

- A Carbonate Quick Look Evaluation Spreadsheet and 100+ Key Equations in MS Excel !

- Morning Recaps; Review of Key Themes; Interactive Petrophysics "What If?" log analysis interrogations; Key movies; Recommendations; Checklists for Non-Petrophysicists, 25 years experience & stimulating debate!

THE INSTRUCTOR [CV](#)

Dr Mark Deakin is a consultant, author and tutor in Petrophysical Data Integration. He holds a Ph.D. in 'Integrated Petrophysics' from London's Imperial College, is an ex Amoco petrophysicist, and has 25 years experience, including 12 as a lecturer and Director of his consulting company, Petrophysics Pty Ltd. He has performed over 50 detailed reservoir studies, primarily in Southeast Asia's difficult carbonate and stacked 'low-contrast-pay' reservoirs, keeping abreast of new technologies by technical reading, operations work and lecturing. Deakin's approach is simple, first identifying and ranking reserves uncertainties then guiding the company towards maximum booked reserves via the systematic integration of targeted "data proofs". After his PhD **Deakin authored the first public "Integrated Petrophysics" course** which has evolved over 20 years to become the industry benchmark course for mainstream petrophysics. Recently Deakin developed "Carbonates & Fracture Petrophysics - A Roadmap" and the **PetroDB** cross-linked database to promote the efficient development of complex reservoirs. Deakin is a member of SPWLA and has offices in Perth, Australia.

PS: If you love petrophysics you will love this course! **REGISTER NOW!** www.petrophysics.net/register.htm