Advanced Integrated Reservoir Analysis Concepts & Techniques

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Introduction:

The goal is for participants to develop subsurface skills for integrated analysis of rocks, pore and fluids and to solve problems associated with identifying and exploiting reserves. Experience gained will allow participants to apply tools for analysis of the underlying uncertainty and assumptions used in many reservoir analysis techniques.

A subsurface integration model presents a thought process for solving reservoir problems, from petro physical rock typing through log analysis.Various quick-scan and quick-look techniques are presented, and participants gain experience with these methods by completing applied exercises. Reservoir issues such as drive mechanisms, recovery factor and scoping simulation models are demonstrated. Experience gained will allow participants to identify lithological zones and fluid types from log data. Physics of the measurements along with practical theory will allow the student to follow simple procedures for the rapid and accurate interpretation of log measurements. Correlation to core and concepts of petro physical rock type and advanced flow units will allow up scaling of log data to reservoir simulation applications. Advanced interpretation concepts will be discussed which will provide the candidates with the tools to understand the limitations of data sets along with measurement requirements for effective reservoir development.

Objectives:

By the end of this course, delegates will be able to:

- Develop an understanding of the professional operations of reservoir engineering, from geology to hydrocarbon recovery.
- Promote, on an international basis, reservoir engineering techniques and best practices relating to the development of oil and gas fields, in order to optimize, technically and economically, company resources and create additional value.
- Provide experts in hydrocarbons resources management the opportunity to practice other disciplines within an international team and develop professionals capable of leading multidisciplinary teams in reservoir development, operations and planning.
- Provide an exposure to a range of gas reservoir conditions through various case studies.

Who should attend?

Geologists, Geophysicists, Reservoir Engineers, Production Engineers, Petro physicists, Petroleum Engineers, Drilling Engineers, Field Development Engineers, Managers, Asset Managers, Oil & Gas Engineers, Reservoir Operators, Surveillance Engineers, Technicians, Engineering Trainees, Technical Managers, Technical Assistants, Technicians, Chemists, Physicists, Technical Supervisors, Service Company Personnel responsible for improving the performance of petroleum reservoirs

Course Outline:

- The integration problem-solving model is demonstrated via case histories
- The goal is for participants to identify the skills needed to produce an integrated solution
- Determining Petro physical rock types and advanced flow units are illustrated case studies

- Techniques are presented for uni-modal and bi-modal pore geometries
- A pragmatic approach is used to eliminate the mystery of two-phase flow, relative permeability, and wettability
- Exercises show how reservoir engineers apply these principles
- Petro physical rock types are determined using 3 or 4 common methods and results are compared
- Participants complete a core-log well analysis determining pore throat size
- Petrophsyical rock types advanced flow units and completing a saturation height model using spreadsheets
- An exploitation exercise is used to identify if there is additional potential in a mature field
- Quick-look interpretation with practical logging-physics concepts, including resistivity, SP, Gamma ray theory and calculation of RW
- Applied exercises show quick-look interpretation for hydrocarbon identification
- Saturation calculations are covered using RWA and overlay techniques
- Calculation of SW uses basic Archie and sensitivity analysis of inputs

- Tool corrections for resistivity
- RXO measurements are explained
- Porosity measurements (sonic, neutron and density), determining lithology, and various cross-plot methods are presented

- Techniques using bulk volume water and Pickett plots are combined with core measurements to determine capillary pressure and electrical rock properties
- Advanced log analysis, including NMR theory, basic dipmeter and borehole image logs, VSP and MDT theory and applications