



*Reservoirs Training Course*

*PVT (Pressure-Volume-Temperature) Properties  
of Reservoir Fluids*

*From 27/11/2023 to 01/12/2023*

*UK – London - Marriott Marble Arch Hotel*

*5500 \$*

### ***Course Introduction***

This Oil & Gas training course is designed to provide an understanding of the reservoir fluid properties and tools that are required for the estimation of hydrocarbon in place and reserves, designing the reservoir depletion process and the surface processing requirements, EOR method selection, identification and quantification of the marketable products and reservoir simulation studies. Following completion of this course, all participants should be able to make decisions on field development planning with increased confidence. This training course will feature:

- A review of the components of naturally occurring petroleum fluids.
- The importance of phase diagrams and the relationships between the five reservoir fluids.
- An outline of the most accurate methods for obtaining values of reservoir fluid properties from laboratory data and correlations.
- Discussions on sampling procedures and quality control.
- An understanding of Cubic Equations of State (EOS) development and applications.
- How to characterise reservoir fluids for EOS tuning.

### ***Course Objectives***

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

- Describe the phase behaviour of reservoir fluids and production mechanisms using phase diagrams.

- Explain and define saturated reservoirs, under-saturated reservoirs, bubble point pressure, gas and oil formation volume factors, solution and producing gas-oil ratio.
- Determine the properties of natural gas, oil and water required for reservoir engineering calculations.
- Use PVT reports to determine oil and gas reserves.
- Optimise separator operating conditions and perform separator calculations.
- Explain reservoir fluids characterisation and EOS Tuning procedures.
- Make decision on field development planning.
- Describe the phase behaviour of gas hydrates.

### ***The Course Content & Outline***

#### **Day One: The Components of Reservoir Fluids, the Five Reservoir Fluids and their Phase Behaviour and Compositional Gradients in Reservoirs**

- Introduction.
- Components of Naturally Occurring Petroleum Fluids.
- Identifying Components - Single Components and SCN Fractions.
- Phase Behavior – Pure Substances.
- Two Component Mixtures, Three and Multi-component Mixtures.
- The Five Reservoir Fluids.
- Compositional Gradients.

#### **Day Two: Properties of Reservoir Fluids and including Recombination Calculation Ideal and Real Gases**

- Real Gases - SPE 26668.
- Properties of Dry Gases.
- Properties of Wet Gases.
- Properties of Black Oils – Definitions.
- Properties of Black Oils – Field Data.

**Day Three: Reservoir Fluids Sampling and Analysis, PVT Reports and Application**

**Well Sampling**

- Properties of Black Oils – Reservoir Fluid Studies.
- Swelling Test and MMP.
- Retrograde Gases.
- Application of Laboratory PVT Studies to Predict Reserves.
- Volatile Oils.

**Day Four: Reservoir Fluids Properties from Correlations, Equilibrium Ratio and Separator**

**Calculations**

- Properties of Black Oils – Correlations (including JCPT Paper).
- Retrograde Gases – Correlations.
- Retrograde Gases and Volatile Oils – Correlations (SPE 102240).
- Gas Liquid – Equilibrium.
- Surface Separation.
- Equilibrium - Ratio Correlations, k-values.

**Day Five: Development and Application of Equation of State (EOS), Reservoir Fluids**

**Characterisation Procedures and EOS Tuning, Properties of Oilfield Waters and Gas Hydrates**

- Cubic Equations of State (EOS) and Applications.
- Hydrocarbon Characterization Procedures: GC, TBP and Physical Properties of SCN Groups.
- Hydrocarbon Characterization Procedures: Splitting, Lumping and Physical.
- Properties of MCN Groups.
- Properties of Oilfield Waters.
- Gas Hydrates.

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