Best Technology Solutions **BTS**

## Principles of Carbonate Reservoirs Training Program

## Introduction:

This course is designed to develop skills in understanding of the basic geometry and Petrophysical characteristics of carbonate reservoirs which can exhibit highly heterogeneous and complex properties. A key dynamic of the course is a series of exercises utilizing subsurface data sets that include core data, geophysical logs and seismic are given. A focused and a comprehensive approach is needed to better understand the nature of the rock containing the fluids and the flow properties within the porous and often fractured formations. This involves detailed understanding of the fluids saturation, pore-size distribution, permeability, rock texture, reservoir rock type, and natural fracture systems at different scales. Depositional fabric, grain type and size and subsequent diagenetic modifications are the major controls on carbonate reservoir behavior. The complex inter-relationship of the depositional and burial history can be unraveled to allow prediction of reservoir facies and reconstruction reservoir models.

## Who Should Attend?

Geologists, Geophysicists, Reservoir Engineers, Production Engineers, Petrophysicists, 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 Objectives:

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

- Understand the basics of petroleum systems, how the carbonates are formed, deposited and changed through the geological time
- Learn how to identify carbonate facies, reservoir quality and pore systems, including diagenesis and fracturing

- Understand carbonate depositional concept and sequence stratigraphy
- Recognize tools and understand how model carbonate reservoirs
- Understand the basics of log data and responses to carbonate reservoir
- Determine the controlling factors for porosity, permeability and saturation in carbonate reservoirs

## Course Outline:

**Petroleum Systems and Components**

- Basic principles
- Depositional concepts
- Grain types
- Textures and fabrics
- Environmental reconstruction
- Sequence Stratigraphy
- Seismic data acquisition and interpretation

**Carbonate Depositional Environments**

- Sabkha/tidal flat
- Lagoon
- Shelf
- Reef (rudist and coral/algal)
- Barrier/shoal
- Slope and redeposited
- Aeolian and lacustrine
- Karst plays

**Petrophysical Property Development and Characteristics**

- Primary and secondary porosity
- Compaction

- Pressure solution
- Cementation
- Dolomitisation
- Porosity generation and destruction
- Fractures
- Carbonate rock classification (Dunham, Folk and Lucia)

**Log Data and Carbonate Responses**

- Gamma
- Sonic
- Neutron
- Density
- FMS
- Log Correlation

**Carbonate Reservoir Modelling and Integration**

- Fracture reservoirs
- Reservoir modelling
- Volumetric assessment in correlation and mapping
- Effects of capillary pressure
- Interface with engineering