



## Carbonate Reservoir Geology Training Program

### Introduction:

This course is designed to develop skills in understanding the geometry and petrophysical characteristics of carbonate reservoirs. 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 of three-dimensional reservoir models. The course demonstrates the value of the reservoir model in volumetric assessment and development of carbonate reservoirs.

This program is a must for geologists, geophysicists, exploration and production managers and engineers dealing with exploration for and exploitation of carbonate reservoirs. The course starts with a comprehensive overview of the basic characteristics of the carbonate depositional system important to carbonate reservoir development. The application of sequence stratigraphic concepts to carbonates as a predictive tool in exploration for and modeling of carbonate reservoirs will be stressed. The engineering and geologic aspects of carbonate pore systems will be explored. Carbonate porosity modification and evolution will be discussed in a sea level driven sequence stratigraphic framework. Problems of reservoir heterogeneity and carbonate reservoir modeling will be discussed.

### Who Should Attend?

Geologists, Geophysicists, Petrophysicists, Stratigraphers, Geochemists, Reservoir, Petroleum, Wellsite Geologists, Petroleum Engineers, Drilling Engineers, Reservoir Engineers, Production Engineers, Operations Engineers, Technologists, Log Analysts, E&P Personnel, Exploration & Development Personnel, Geologists, Reservoir Engineers, Seismic Interpreters, E&P Managers, Data Management and Oil & Gas Personnel

## Course Objectives:

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

- Recognize basic characteristics of the carbonate depositional system important to carbonate reservoir development
- Understand how sequence stratigraphy can be applied to carbonates and mixed carbonate-siliciclastic systems
- Understand the geologic and engineering characteristics of carbonate pore systems
- Recognize the nature of carbonate porosity modification by diagenesis and the role of sea level and climate in porosity modification and gross reservoir heterogeneity
- Develop viable exploration and exploitation strategies in a carbonate terrain by working with actual subsurface data sets

## Course Outline:

### Carbonate Reservoirs

- Basic principles
- Depositional concepts
- Grain types
- Textures and fabrics
- Environmental reconstruction

### The Reservoir Model: Depositional & Diagenetic Characteristics

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

### **Carbonate Diagenesis**

- Primary and secondary porosity
- Compaction
- Pressure solution
- Cementation
- Dolomitisation
- Porosity generation and destruction
- Fractures

### **Carbonate Sequence Stratigraphy**

#### **Log Response in Carbonate Rocks**

- Gamma
- Sonic
- Neutron
- Density
- FMS

### **Reservoir Assessment**

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

### **The Basic Nature of Carbonate Sediments and Sedimentation**

### **The Efficiency of the Carbonate Factory and Its Influence on Cyclicity and Platform Development**

**Carbonate Platform Types**

**Carbonate Facies Models**

**Basic Concepts of Sequence Stratigraphy**

**Relationship of Stratigraphic Patterns to Changes in Subsidence Rates**

**Sequence Stratigraphic Models**

**The Characteristics of Carbonate Pore Systems and Their Geologic and Engineering Classifications**

**Sea Level, Diagenesis, Porosity Evolution and Its Distribution at the Time of Burial**