

Clastic Sedimentation and Sequence Stratigraphy

Consultant / Trainer

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The **Petrogenium** (in collaboration with EPTS) **Clastic Sedimentation and Sequence Stratigraphy** course will provide participants a comprehensive understanding of clastic sedimentary systems, emphasizing how depositional environments and sequence stratigraphy influence reservoir characteristics. It helps them recognize how these factors control the distribution, geometry, and properties of reservoir and non-reservoir rocks. This knowledge supports better decision-making across the entire hydrocarbon resource life cycle—from exploration and appraisal to development and abandonment.



Participants

This **Petrogenium**. course is designed for Petroleum geoscientists and petroleum engineers in the initial phase of their EP career, who need to be fully conversant with sedimentology and stratigraphy as key tools in the Oil- and Gas Industry.



Learning Objectives

At the end of the course the participants will be provided an overview of clastic stratigraphic analysis and sequence stratigraphy. Course focuses on how geological characteristics of a reservoir impact on EP decision making during all phases of a field's life cycle.

By the end of this 5-day course, participants will be able to:

- to describe the main characteristics of common clastic reservoir types and how these characteristics are controlled by the combination of depositional origin and sequence stratigraphic setting
- to identify the key practical implications of the inferred reservoir characteristics, both for their own discipline and for the E & P project as a whole
- to communicate effectively about these technical issues with the other disciplines involved in the E & P project
- to contribute effectively to managing and mitigating risks to exploration and/or development activities in E&P projects.

Programme

DAY 1

Clastic depositional systems

1. Course Introduction
2. Sedimentology and Stratigraphy: why do they matter to the Oil Industry?
3. Fluvial depositional systems and reservoir characteristics
4. Course participants will gain a sound understanding of how the large-scale reservoir architecture and the internal reservoir property variation of a clastic sedimentary deposit are controlled by the combination of its stratigraphic setting and depositional origin. Secondly how this controls fluid flow in subsurface reservoirs. This overview is followed by a review of different fluvial deposits and their reservoir characteristics. Emphasis is placed on how the macro- and meso-scale reservoir heterogeneity that typifies many fluvial reservoirs, impacts on recovery efficiency and well numbers.

DAY 2

Clastic depositional systems

1. Participants' learning points from the previous day
2. Fluvial depositional systems and reservoir characteristics [Ctd]
3. Lacustrine depositional systems and reservoir characteristics
4. Deltaic and coastal depositional systems and reservoir characteristics
5. The module on fluvial reservoirs is concluded with an exercise that integrates seismic, core, log, and production data. Lacustrine systems are commonly important both as reservoirs and as source rock systems. Lacustrine systems are also natural laboratories to illustrate sequence stratigraphic principles due to the rapidity of base-level variations as compared to open marine depositional systems. Lacustrine 'source rock factories' are placed in their plate tectonic and climatic settings. Deltaic sedimentation: sediment supply vs wave action vs tidal action as controls on delta type and shape.

DAY 3

Clastic depositional systems

1. Participants' learning points from the previous day
2. Deltaic and coastal depositional systems and reservoir characteristics [Ctd]
3. Deepwater mass-flow mechanisms
4. Deepwater depositional systems and reservoir characteristics

Programme

DAY 3 - continued

5. Sea-floor topography as a key control on deepwater depositional architecture
6. Carbonates vs Clastics - a comparison
7. Reservoir characteristics of deltaic and coastal depositional systems with emphasis on macro- and meso-scale reservoir architecture and internal reservoir property variation. Mass-flow mechanisms [e.g. turbidity currents] in deepwater settings and the resulting depositional systems (e.g. slope channels & basin-floor fans) and the reservoir characteristics of different turbidite deposits. Salt and/or clay diapirism as a key control on sea-floor topography and the effect of that topography on turbidite deposition. Why the biogenic origin of carbonates makes the petrophysical characterisation of carbonate reservoirs more complex than for clastic reservoir rocks, and why this results in much greater uncertainty in reservoir models and volumetric estimates.

DAY 4

Sequence stratigraphy

1. Participants' learning points from the previous day
2. Sea-level change: the processes and their spatial and temporal scales
3. Sequence stratigraphy: a tool to analyze sedimentary sequences
4. Optional workshop module based on Client data [by prior arrangement]
5. Sea level [= 'base level'] variations at different spatial and temporal scales are the key control on how and where sediments accumulate in a basin. A sequence stratigraphic analysis of a sedimentary sequence must therefore be based on a sound understanding of the different processes that drive both relative and eustatic sea-level changes. Use and abuse of the global sea level curve ['Haq curve'].
6. Sequence stratigraphy and seismic stratigraphy: origin of these tools to analyze sedimentary basin-fills. How 'High-stand' and 'Low-stand' sea levels affect the deposition of sandy reservoir rocks, shale-rich seals and organic-rich source rocks within a basin. Why clastic deepwater turbidites typically form during a 'Low-stand' sea-level, whereas carbonate deepwater turbidites typically form during a 'High-stand' sea-level.

Programme

DAY 5

Course summary and review of key technical aspects

1. Participants' learning points from the previous day
2. Sequence stratigraphy: the essentials [Ctnd]
3. Course overview and summary
4. Course test by participants
5. Close-out
6. To re-inforce the participants' learning an extensive summary of key technical messages as presented in the course is given. This complements the daily review of the participants' own learning points from the previous day. The course is concluded with the participants taking a multiple choice questionnaire test.

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Contact Petrogenium.:

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