Seismic & Sequence Stratigraphy for Oil & Gas Exploration

10 days

Overview

LEVEL
Expert

PURPOSE
This course provides, through daily practical exercises and an integrated project, a thorough and very practical understanding of seismic and sequence stratigraphy for Oil & Gas exploration.

LEARNING OBJECTIVES
Upon completion of the course, participants will be able to:
understand the use of sequence stratigraphy as a tool in basin exploration, and describe related workflow structure,
ensure accurate stratigraphic breakdown of well data,
manipulate and use a full dataset in an integrated project: well logs, biostrat information, and 2D lines.

WAYS AND MEANS
The most important elements in this process are accurate stratigraphic breakdown of well database and stratigraphic data loading both into the well and the seismic databases.
Software used during workshops: with courtesy of Schlumberger.

LEARNING ASSESSMENT
Knowledge assessment with multiple choice questions and open explanatory questions.

PREREQUISITES
No prerequisites for this course.

Agenda

WEEK 1
SEQUENCE STRATIGRAPHY CONCEPTS & METHOD
Shellal accommodation space. Tectonic, eustasy and sediment control on the stratal and facies stacking pattern of depositional sequences.
Practical paleontology:
Establishment of a chronostratigraphic framework to support well and seismic correlation.
Precise definitions of paleo-environments and water depths in order to predict reservoir facies.

WELL LOG & SEISMIC RESPONSES OF LOWSTAND SYSTEMS TRACTS
LST sequence boundaries, slope fans, basin floor fans and prograding complexes.
TST & HST basin starvation, source rock and reservoir seal.
Biostratigraphic signature of lowstand versus transgressive/highstand systems tracts.
Hierarchy of stratigraphic cycles.

WELL LOG/SEISMIC RESPONSES OF NERITIC SYSTEMS TRACTS
LST sequence boundaries, incised valley and lowstand prograding complex.
TST & HST stratal and facies stacking pattern.
HST alluvial, deltaic, shoreline complexes and shelf sands.
Biostratigraphic signature of transgressive and highstand systems tracts.
Relationship of stratigraphic patterns to changes in subsidence rates as driven by regional and earth scale tectonic processes.

**WEEK 2**

**LOG/SEISMIC RESPONSES OF NERITIC SYSTEMS TRACTS (ALLUVIAL PLAIN TO DELTA FRONT)**

LST sequence boundaries, incised valleys, major unconformities and prograding complexes.
TST incised valley fill, shelfal aggradation.
HST alluvial, deltaic, shoreline complexes.
Stratal and facies stacking pattern in the alluvial plain.
Forestepping sequences and major unconformities as driven by regional and earth scale tectonic processes.

**LOG/SEISMIC RESPONSES OF NERITIC SYSTEMS TRACTS (SILICICLASTIC SHELF)**

LST sequence boundaries, incised valleys, major unconformities and prograding complexes.
TST in shelfal environment (log-to-core scale).
HST in shelfal environment (log-to-core scale).
Stratal and facies stacking pattern in a siliciclastic shelfal system.
Biostratigraphic signature.
Hierarchy of stratigraphic cycles.
Exploration & Production consequences and related strategies.

**DATA INTEGRATION**

Interpretation of a set of wireline logs covering the Mesozoic-Cenozoic succession to tie.
Transgressive/regressive facies cycles and unconformity surfaces. A quantitative paleontological datasets is used to aid in determining maximum flooding surfaces, peak transgression and unconformities.
Interpretation of a regional basin-scale seismic line tied to the wells. Mapping of various potential reservoir intervals.
Data integration: Exploration & Production consequences and related strategies.