<첨부1> 강의 계획서(요약)

Deep-water Turbidite Depositional Systems and Reservoirs

DWT

This course provides a unique opportunity to examine modern, ancient, and subsurface examples of data from turbidite reservoirs. The process of iteration of data types, including analog data that was collected expressly to solve subsurface issues, will be offered to validate subsurface interpretations. The course combines review of state-of-the-art and historical theories for turbidite and debris-flow deposition and process including many case studies of reservoir architecture and sand-body quality and distribution with an introduction to new concepts, ideas, and methods in turbidite reservoir geology.

Participants will be introduced to the limitations of conventional models for turbidite reservoirs and taught how to build enhanced predictive models using a combination of subsurface, outcrop, and modern sea-floor data. Through practical exercises and discussions, participants will experience the relative importance of a broad range of subsurface data, including the merits of different wireline log data for distinguishing lithostratigraphic units. 3D seismic data from a range of locations will illustrate the quality and level of reservoir resolution possible when using modern data. Modern sea floor data from several turbidite basins will be available and participants will receive instruction on interpretation, especially where sea floor data can be used as a proxy of sand distribution in reservoirs. Criteria for identification and interpretation of injected sandstones will be discussed, including explanation of their mechanisms of formation, and the understanding of their influence on reservoir characteristics. Special note: sessions in Nice and Kilkee will include field trips. The seven-day sessions will be combined field and classroom based sessions. There will be four days in the classroom with lecture material and oilfield exercises on exploration and production, and three days in the field examining spectacular deepwater sections of either the Annot Sandstone Formation in Nice, Ross Sandstone Formation in Kilkee, or the Point Lobos Submarine Canyon and Pigeon Point Formation in Monterey, California. For Nice session, a moderate degree of physical fitness is required. For Kilkee, the going is easier in the field.

LEVEL — Intermediate

DESIGNED FOR

Exploration and production geologists and geophysicists, stratigraphers, reservoir engineers, and petrophysicists.

YOU WILL LEARN HOW TO

- Interpret turbidite depositional environments using data from cores, cuttings, and wireline logs
- Prepare predictive facies maps
- Apply modern stratigraphic concepts to turbidite reservoirs
- Predict reservoir size, shape, trend, and quality

COURSE CONTENT

- Review of turbidite settings, processes, models
- Turbidite systems at outcrop
- Rock analogs for the subsurface (including injected sands)
- Modern deepwater systems
- Alternative reservoir geometrics
- Seismic character of deepwater systems
- Borehole/wireline characteristics
- Significance and use of various tools
- Correlation of reservoir units
- Predictive models for sand distribution
- Critical data input to reserve models
- Definition of pay

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Daily Agenda

Daily schedule is approximate

DAY 1

OVERVIEW

TURBIDITES

- Sedimentary processes and facies
- Triggers and controls
- Morphology of the sea floor
- Exercise
  - Interpreting turbidite facies
- Fan models
- Sequence stratigraphy
- Exercise
  - Vertical patterns in turbidite sequences?

DAY 2

CANYONS

- Morphology
- Case studies
- Ancient case studies
- Exercise
  - reting canyons from logs

SUBMARINE SLOPES

- Fan deltas
- Exercise
  - Facies distribution in deep-water fan deltas
    - Brae System, North Sea

DAY 3

CHANNELS

- Morphology
- Fills
- Channel levee growth
- Vertical sequences
- Exercise:
  - Vertical expression of deep-water channel fills and levees
- Channel margins
- Ancient case studies
  - Ainsa Channels, northern Spain
  - Solitary Channel, southern Spain
  - Tinker Channel, eastern Turkey
- Exercise:
  - Connectivity and correlation in deep-water channels

DAY 4

SHEETS:

- Sedimentary facies
- Location and seismic expression
- Ancient case studies
- Exercise
  - Layered sheets versus amalgamated sheets
- Subsurface examples
- Exercise
  - Log expression and correlation

DAY 5

MAJOR EXERCISES ON INTERPRETATION AND CORRELATION OF TURBIDITE ELEMENTS IN THE SUBSURFACE

SYNTHESIS