Geopressure: Prediction, Analysis and Risk Assessments for E &P
(5 days course / workshop)

This is the most comprehensive course using the basic models of geology, petrophysics, rock-mechanics and hydrodynamics to compute, predict and appraise subsurface geopressure and consequently, evaluate your prospect’s risk pre-and post-drilling.

The course / workshop focuses on know how to calculate and run your own pore pressure prediction and analyses, based on a geo-scientific foundation, rather than software design. It applies standard methods of calculating pore-fracture pressure and also discusses some of the pitfalls related to specific widely used applications. The course proceeds from the known (measured pp) to the unknown (predicted pp). Moreover, the training sessions explain the development of the subsurface geopressure compartments with depth and their impact on drilling prognoses, hydrocarbon entrapments, and risk assessment. We will lay down the foundation of establishing the prediction variables and exponents (from seismic velocities and offset wells) needed for each individual basin. Moreover, the course examines in depth the calibration process of the prediction model during and post drilling. Mud weight, casing programs and anticipated drilling challenges will be discussed.

Supra salt, sub-salt models, fault seals, Strat-geopressure fairways, and geopressure impact on AVO assessment are some of the main topics of this course. Moreover, the setting of geological basins world wide and their impact on the geopressure profiles are discussed in case history forms.

Who should attend?
Geologists, geophysicists, drilling and reservoir engineers, well log analysts, basin-model specialists, managers, and support staff involved in exploration, development and drilling.

Course outline:
- New approach to causes, models and definitions
- Geopressure vs. Hydrodynamics
- Pore pressure plots (PSI and PPG MWE), including some of their pitfalls
- PP-FP direct and pertinent measurements
- Transgression, regression, pressure decay, Centroid ?, and hydrocarbon effect
- Models and Methods used for PP prediction
- Data needed for PP prediction:
  - Overburden vs. PS, especially in Salt Basins
  - Defining Top of Geopressure
  - Normal Compaction Trend (NCT) delineation and pitfalls
  - Assigning a model for PP-FP prediction
- Different standard methods with emphasis on the Effective Stress Model and Eaton’s relationship
• PP predictions calibration methods

• **Technique used for PP and FP prediction**
  ✓ Pre-drilling: Building the geological blocks
    Seismic velocity-Qualification for PP predictions
    Prediction model from seismic and offset wells
    Limitations and pitfalls
  ✓ While drilling: Calibration using direct and pertinent data
    Model inversion for the purpose fine adjustment
  ✓ Post-drilling: Compartmentalization, risk assessment and appraisal

• **Analysis and applications for Lead and Prospect evaluation**
  ✓ Compartmentalization, seal effectiveness and retention capacity
  ✓ Transgression and regression
  ✓ Geopressure compartmentalization vs. hydrocarbon entrapment
  ✓ Supra-Sub Salt stress models and their application for PP-FP prediction
  ✓ Build 2D and 3D geopressure models
  ✓ Fault’s sealing capacity in relation to type and angle
  ✓ Reserve and reservoir management
  ✓ Drilling casing and mud programs
  ✓ Anticipated drilling challenges due to compartmentalization
  ✓ Challenges in deep water and HTHP environments
  ✓ AVO assessment due to subsurface geopressure profile
  ✓ Strat-Geopressure Fairways analysis
  ✓ Appraisal of the un-drilled offset structural segments on the prospect

• **Global case histories and their implications:**
  ✓ Gulf of Mexico/Trinidad
  ✓ Continental North America
  ✓ Mediterranean Basin and North Sea
  ✓ Australia and Far East

Attendees need laptop with Office Microsoft Excel and imaging application (for example: Paint or Imaging for Windows etc). Exercises, interpretations and analyses are conducted using case histories from the shelf and deep water in analog and digital formats.

*A strong mathematical and Excel backgrounds IS NOT necessary.*

Pore pressure software is not a “one size fits all” product. This course will give you the knowledge to tailor your interpretations to the subsurface setting and accordingly modify the prediction software applications you are currently using.