**Geopressure:**
*Prediction, Analysis and Risk Assessments For E & P (4 days)*

**Course Description**

This course demonstrates how to run your own pore pressure prediction and analyses, based on a geo-scientific foundation, rather than software design. The course also discusses new models and some of the pitfalls related to specific widely used applications.

*It is the most comprehensive course using the straightforward models of geology, rock-mechanics and hydrodynamics to predict and appraise subsurface geopressure and consequently evaluate your prospect risk pre- and post-drilling.*

It focuses on the **know how** to apply models, calculate predicted pore pressure, and assess measured and predicted pore pressures. The course proceeds from the known (measured) to the unknown (predicted). It explains the relationship between the geopressured compartments and the progression of the predicted pore pressure with depth. In addition, this course examines in depth the causes of disparity between predicted and measured pore pressure.

> "I enjoyed the class on geopressure and found it to be most helpful and I came away with new ideas on working with service companies on geopressure “
>  
> John Rogers, Senior Geological Advisor, Petrobras America Inc., 2007

With the knowledge gained from this course you will be able to QC the measured and predicted data. You will also learn how to use the seismic velocities and the petrophysical data from offset wells to build the prediction model for a proposed offset wildcat. We will lay down the foundation of establishing the prediction variables and exponents needed for each individual basin. Moreover, the course examines in depth the calibrations process of the prediction model during and post drilling. Mud weight, casing programs and anticipated drilling challenges will be discussed. Drilling challenges due to deep water and HTHP in deep shelf environments will be demonstrated.

A thorough instruction supported by several exercises demonstrates how to analyze, evaluate and assess geopressure subsurface profile for the purpose of generating, evaluating, and drilling a prospect. The course also deals with post drilling risk assessment of a play concept, leads and prospects. In addition we will discuss opportunities to make the best use of evaluating dry holes subsurface compartmentalization to reduce the risk of forecasted prospective offset wells.

**No specific prediction software needed. All the exercises, analysis and plots will be conducted using Microsoft Excel spread sheets.**

**Who should attend?**
Geologists, geophysicists, drilling and reservoir engineers, well log analysts, managers, and support staff involved in exploration, development and drilling.
Course info

- Short review of geopressure fundamentals (one day course)
- Pore pressure plots and their technical uses
- Predicted vs. measured PP and FP and how to QC the data
- Transgression, regression, P decay, Centroid, and hydrocarbon effect
- 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
- Models and Methods for PP prediction
- Emphasis on the **Effective Stress Model** and Eaton’s relationship

**Technique used for PP – 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 Play concept, 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
- AVO responses to subsurface geopressure profile
- Build 2D and 3D geopressure models
- Strat-Geopressure Fairways analysis
- Faults sealing capacity in relation to type and angel
- Reserve and reservoir management
- Drilling casing, and mud programs (MMS regulations)
- Anticipated drilling challenges due to compartmentalization
- Challenges in deep water and HTHP environments
- Appraisal of the un-drilled offset structural segments on the prospect.

**World wide case histories and their implications:**

- Gulf of Mexico/Trinidad
- Continental North America
- Mediterranean Basin and North Sea
- Australia and Far East
Exercises, interpretations and analyses are conducted using case histories from the shelf and deep water in **analog** and **digital** formats. Attendees need laptop with Microsoft Excel and imaging application (for example: Paint or Imaging for Windows etc).

**Prerequisite:** one day course

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"I enjoyed the class and learned a lot from you."
Dr. Rone Shu, iMOSS Project Manager, Rock Solid Images., 2007
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