Practical Geopressure Detection and Prediction

A practical Course designed for the well drilling planning and construction team

Instructor:
Robert Dwiggins II
DSI Associate

Objectives

1. Develop a comprehensive understanding of geopressure generation, occurrence, and detection in real time
2. Focused practices on real time detection of pore pressure relative to mud pressure
3. Understand the practical methodologies for estimating pore pressure in shale, sandstones, and in carbonate with the necessary caveats for each lithology

Who should attend?

Anyone who is connected with well construction from the planning phase to post mortem including drillers, toolpushers, drilling engineers, geologists, crew members, and service personnel.

Course Materials

The course will be delivered using a mixture of power point presentation, a course manual, and some use of software tools.

Instructor:

Robert Dwiggins II- Vita Attached

Course Content:

Day	Topics
1	**Fundamentals of Geopressure Occurrence** • The well planning process • The role of pore pressure prediction on well planning • Deep water wells • Geopressure Concepts and Basic Definitions • Hydrostatic Pressure vs Water Salinity • Normal Pressure, Subnormal Pressure, Abnormal Pressure • Overburden Pressure • Abnormal Pressure Causes (Undercompaction, Aquathermal Expansion,

Contact us:
info@drill-sense.com
(713) 609-9865 (USA)
drill-sense.com

	Clay Digenesis, Tectonics, others)
	• Faults and Fractures
	• Topography
2	**Pore Pressure Detection While Drilling** • Abnormal Pressure Indicators While Drilling • Gas (trip, background, connection, extra) • ROP (d-exponent) • Cuttings and Cavings • Temperature (surface temperature in land and deepwater wells) • Mud Chlorides • Abnormal Pressure Indicators (Logging and Seismic) • Case studies
3	**Basic Pore Pressure Principles and Calculations** • Effective Stress (Terzaghi's Equation) • Bulk Density from Porosity • Effective Stress versus depth for different Water Depths • Overburden Gradient Calculation • Gardner Transforms (Velocity / Density, Sonic / Density) • Calculating near-mudline RHOB's • Calculating RHOB's without any data • Recommendations for Calculating OBG • Pore Pressure Models • General Velocity / Effective Stress Relationship • Vertical and Horizontal Effective Stress Methods • Sonic Normal Trends • Bowers velocity / effective stress • Virgin Pressure Case • Secondary Pressuring (Unloading) • Bowers velocity / effective stress (unloaded case)

Contact us:
info@drill-sense.com
(713) 609-9865 (USA)
drill-sense.com

		• Virgin pressure case • Unloaded case • Variances in pressure predictions according to model
4		**Pore Pressure Interpretation Pitfalls** • Pressure regressions • Pressure Compartments • Lithology changes and Normal Trends • Shale hydration / mud invasion • Structural Uplift (Centroids) • Temperature • Secondary Pressuring (Unloading) • Anisotropy • Uncertainty analysis

5		**Fracture Gradient**
		• Fracture Gradients Models and Assumptions
		• Horizontal to Vertical Stress Ratios ("Poissons" or K0)
		• Calculating matrix stress coefficients
		• Non Conventional Fracture Gradient Estimation
		• Measurements of In Situ stress
		• Computation of In situ Minimum Stress from Losses Events
		• Class Projects
		    • Pore pressure prediction from seismic data alone
		    • Pore pressure prediction in real time
		    • Post mortem pore pressure analysis

The Instructor: Robert Dwiggins II

Over 28 years experience in wellsite operations, surface and down hole data processing and interpretation. Geopressure and wellbore stability analysis using Drillworks software suite. Drilling rig supervision, drilling engineering, technical training, and consulting in geopressure detection, prediction, and analysis including offshore and international drilling operations. Bob specializes in pre-drill and post-well analysis using client-supplied data to develop geopressure profiles including wellbore stability studies, uncertainty and seal compartment integrity analysis. As one of our most experienced analysts, Bob advises customers and peers on optimal techniques for using Drillworks software to analyze geopressure and sub-surface hazards. He has conducted custom customer training at both domestic and international locations and performed field geopressure analysis using Drillworks software in the Gulf of Mexico, Australia and Trinidad. He contributes to help system enhancements for Drillworks solutions software and features.

Contact us:
info@drill-sense.com
(713) 609-9865 (USA)
drill-sense.com