Improving Geopressure Assessment Through Robust Facies Modeling

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ABSTRACT

It is well known that to define a safe drillable pressure profile requires a low side bounded by formation pressures and an upper side defined by the fracture pressure combined with their associated uncertainties. In more complex settings, such as during development drilling and extended reach wells, it is more common to include a collapse pressure curve in order to determine the mudweight to prevent compressional or tensile failure. Typically, during the design stage, these profiles used as a basis for selecting casing points and drilling parameters.

Any pore pressure model should be developed early in the E&P cycle, and then refined as new data become available, when a prospective area becomes of exploration focus, and when field development is to be undertaken. The best practice workflow requires a full 3D understanding (via inversion) of the facies, their geometries, and the elastic properties in combination with well-based observations and a process-driven approach to build a coherent geologically-aware pressure model.

In this presentation we will present global case studies on a best practice approach to pore pressure modelling through integration of multiple data sets (offset well data, elastic and inversion properties, geological interpretations).

BIOGRAPHY

Alex is the Global Portfolio Manager for Wells at Ikon Science based in the Surbiton (UK) office. Over the years Alex has worked as a specialist in pore pressure and fracture gradient analysis, with a particular emphasis on the integration of geopressure work with other Ikon disciplines, such as rock physics and geomechanics. Alex also acts as the technical advisor for the regional studies group. He is also highly involved with geopressure research, writes technical papers, presents at international conferences and regularly publishes on a variety of pore pressure topics.

Alex joined Ikon Science in 2009, and has since been involved in many projects, covering all key technical aspects including, regional pore pressure analysis, field evaluation (seal breach and hydrodynamics), pre-drill, real-time and post-drill analyses, and the integration of geomechanics and rock-physics with pore pressure. These projects have covered many geological settings and challenges from uplifted basins (Barents Sea, West of Shetlands), extensional basins (North Sea), compressional basins (Sabah), deep water (Labrador, Myanmar, French Guyana, Suriname), unconventional (onshore), and carbonates (Morocco).

Before joining Ikon in 2009, Alex received a MESci in geology (2005) at the University of Liverpool and a PhD in structural geology at the University of Manchester. Alex is part of the team of trainers within Ikon responsible for pore pressure theory training and RokDoc software training.