RMAG August Luncheon
August 5, 2026

Fault Activation Behavior in the Austin Chalk of South Texas: Integrating Seismic Symmetry and Completions Diagnostics

Speaker: Rachel Stocking, Ubiterra Corporation (ZoneVu)

Development in the Austin Chalk of South Texas increasingly requires operators to navigate structurally complex reservoirs where hydraulic stimulation interacts with pre-existing faults and fracture systems. These interactions can result in adverse outcomes such as screen-outs, excessive leak-off, fracture-driven interactions (FDIs), and casing deformation, but under certain conditions may also enhance fracture complexity, reservoir contact, and production performance.

This presentation demonstrates a repeatable multidisciplinary workflow integrating seismic symmetry attributes, resistivity image-log-derived fracture characterization, geosteering interpretation, frac diagnostics, and post-frac evaluation to characterize and differentiate fault activation behavior during hydraulic stimulation. Seismic symmetry volumes were used to identify subtle structural discontinuities and fault trends not readily apparent through conventional mapping, providing a framework for evaluating fault orientation, continuity, and activation potential relative to SHmax.

Two anonymized Austin Chalk case studies are presented with contrasting structural environments and stimulation outcomes. In the first case, moderately misaligned fault systems created elevated shear potential associated with screen-out risk and potential casing deformation. Integrated diagnostics enabled mitigation through treatment design modifications while preserving wellbore integrity. In the second case, a more structurally complex environment resulted in increased hydraulic and poroelastic interaction, including S-bend casing deformation. Under controlled operational conditions, this interaction remained manageable and contributed to increased fracture surface area, reservoir contact, and significantly improved production performance relative to the first case study.

The results demonstrate that fault activation behavior exists along a spectrum controlled by structural continuity, stress orientation, geomechanical behavior, and stimulation design. This work highlights the critical role of seismic-derived structural interpretation in completions execution and supports a shift from blanket avoidance of structural complexity toward integrated characterization and controlled management of fault interaction in unconventional reservoirs.

Biography

Rachel Stocking is Vice President of Strategic Growth at Ubiterra Corporation (ZoneVu), where she focuses on connecting drilling, geosteering, geoscience, and completions teams through integrated cloud-based workflows and real-time operational intelligence.

Since entering the oil & gas industry in 2011, her experience has spanned reflection seismology, nodal seismic acquisition, microseismic acquisition, and electromagnetic frac fluid monitoring. Rachel began her career at the Long Beach Oil Field, where work in community relations and government affairs sparked a lasting passion for subsurface technology. She holds a BS in Journalism and Spanish from California State University, Long Beach.