

**Rejuvenating Your Seismic to Assist Exploration and Development:
Seismic Reprocessing Cases from Various Geological Settings in The Gulf of Thailand**
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Abstract

In an ideal world, it is often best to acquire new seismic data over producing fields to further enhance recovery and help identify future appraisal opportunities. Unfortunately, low oil prices, survey costs, permits, surface facility restrictions, and project turn-around times often rule out a seismic reshoot. Given these constraints, one of the key successes for Valeura Energy in the Gulf of Thailand has been to reprocess existing seismic data. Improved computer capacity and lower costs enable application of advance processing techniques, providing a significantly improved image of the subsurface and enhanced field understanding.

Three oil fields that Valeura Energy operates in the Gulf of Thailand: Jasmine, Manora and Nong Yao fields, demonstrate the value of seismic reprocessing. The Jasmine Field mainly produces oil from fault compartmentalized fluvial channel sandstone reservoirs on the northern flank of the Pattani Basin. Also situated in the northern part of the Gulf of Thailand is the Manora Field, which produces oil from lacustrine turbidite sandstones in the Kra Basin. The Manora Field is characterized by a relatively steeply dipping structure split by a large boundary fault. Sitting on the southern flank of Pattani Basin is the Nong Yao oil field, which contains fluvial low relief strata, with the seismic data heavily affected by shallow gas. Each field requires a different processing sequence that is tailored to suit the different challenges. Broadband PSDM for the Jasmine Field, full waveform inversion for the Nong Yao Field, anisotropic PSDM with least-square Kirchhoff Q-migration for the Manora Field/North Kra, and reverse time migration for South Kra are described and compared.

Seismic image improvement reduces seismic interpretation ambiguity. In turn, this provides more accurate volumetric estimation, assists with well placement, and supports reservoir fluid flow simulation. Reprocessing of legacy data using modern technologies and suitable processing flow can be an effective and efficient solution for future exploration and development.

Keywords: seismic processing, Gulf of Thailand