

## CHALLENGING VIEWS TOWARDS MINIMIZATION OF MULTI-COMPONENT DATA COMPLEXITIES

**Amar Ghaziah, Riaz Alai & Hafizal M. Zahir**

PETRONAS Research Sdn Bhd, LOT 3288 & 3289, Off Jalan Ayer Itam, Kawasan Institusi Bangi,  
43000 Kajang, Selangor, Malaysia

The acquisition of seismic multi-component data and the application of various multi-component processing technologies have shown observable benefits in more accurate imaging of the earth's subsurface. Although many successful and advanced technologies have been applied in the oil and gas industry with compressional waves alone, the help of shear waves in addition to existing methodologies has opened new opportunities to many oil and gas companies in finding new reserves. In addition to improved subsurface imaging using shear wave information, they are also inevitable in optimal characterization of reservoirs.

Complexities in multi-component data occur when the wave front suddenly gets distorted due to sudden subsurface velocity changes. An increase of velocities corresponds to waves reaching subsurface salt bodies or hard volcanic rocks. On the other hand, lower velocities are directly related to waves passing through gas clouds, which is characteristic in Malay Basin environments. In this abstract, some challenging views

will be discussed for waves passing through gas clouds and some examples will be shown on field data from the Malay Basin. The critical observations include lower amplitude reflections and minimal propagation of compressional waves, which create serious complexities and challenges in optimal illumination and imaging within these environments.

In this abstract, we review existing efforts and important characteristics of compressional waves as well as shear waves related to data from the Malay Basin emphasizing the added value of shear wave energy towards enhanced understanding and characterization of oil and gas reservoirs.

### REFERENCES

- CHRIS THOMPSON., 2005, Multicomponent Seismic: A Pragmatist's Primer.  
YILMAZ, O. Seismic Data Analysis by, Volume II  
LUC T.IKELLE & LASSE AMUNDSEN, Introduction to Petroleum Seismology.