Applications of shear data in shaly sands

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With the development of new sonic tools, it is now possible to record both compressional and shear slownesses in soft formations. This in turn has allowed the development of more accurate interpretation models for slownesses and Vp/Vs.

Trends identified in sands and shales can be matched with semi-empirical correlations based on the Gassmann equation. These trends can be used to quality control shear logs and for quicklook lithology interpretation. Brie *et al.* has studied the effects of light hydrocarbons on elastic properties and sonic slownesses. They developed existing models to better fit the observed behaviour. With these models it is possible not only to detect gas in shaly sands, but even to evaluate gas saturation provided porosity is sufficiently large.

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 23, No. 6, November-December 1997

Fluid substitution can be performed to estimate acoustic properties of the formation with any fluid mix in the pores. The understanding of the influence of frequency allows the prediction of the slownesses at seismic frequencies for application to AVO modelling.