

PERTEMUAN PERSATUAN Meetings of the Society

Ceramah Teknik (Technical Talk)

Formation evaluation applications of sonic measurements

ALAIN BRIE

Laporan (Report)

Mr. Alain Brie who is the Head of the Interpretation Product Line for Schlumberger K.K. in Japan gave the above talk on May 4th at 3.00 pm at the KL Hilton. The talk was jointly organised by the Geological Society of Malaysia and the Malaysian Society of Exploration Geophysicists. About 80 to 90 geologists, petrophysicists and geophysicists from various oil and service companies, and universities turned up for the talk covering the basic aspects and recent developments in sonic measurements and its applications. Such interesting was the talk that most participants were willing to stay until well after 5.00 pm for the speaker to finish up his presentation. Schlumberger Oilfield Services sponsored the refreshments and High Tea.

Mr. Alain Brie is an expert in log interpretation, specialises in the processing and interpretation of log measurements. He is also in rock mechanics and in the interpretation of resistivity, electromagnetic and nuclear measurements. During his 25 years career with Schlumberger, Mr. Brie previously occupied positions as interpretation development expert, research scientist, log analyst training manager, log analyst and field engineer. He is a graduate engineer from ENSMA in Poitiers, France, and a member of the SPLWA, SEG and SPE.

Abstrak (Abstract)

Sonic measurements traditionally used the compressional slowness for seismic time for depth calibration and porosity evaluation. Since the introduction of the dipole sonic tools, the shear measurement is available in different types of formations. Simultaneous use of the compressional and shear slownesses not only allows more detailed evaluation of the lithology and porosity, but can also be used to obtain gas content in shaly sands. A detailed evaluation provides dry frame properties for input to rock mechanics or for fluid substitution, and input to seismic AVO calibration and seismic modelling. Dipole shear measurements are directional and can resolve TIH anisotropy which is the anisotropy caused by horizontal stress imbalance or sub-vertical fractures. The fast shear azimuth is a good indicator of the maximum horizontal stress direction.

Low frequency Stoneley measurements have applications for fracture evaluation and permeability estimation. When combined with anisotropy directions, they identify fault zones which are highly productive in hard rocks. In the most recently developed application, seismic-type processing of compressional waveforms acquired at very long spacings provides images of discontinuities up to 30 ft away from the borehole. This has applications to image cap rocks in horizontal wells or fractures and promises to bridge the gap between sonic and seismic measurements.

CNL & Rokiah Esa