CERAMAH TEKNIK TECHNICAL TALK

THE USE OF QUANTITATIVE DIGITAL OUTCROP ANALYSIS TO DEVELOP BETTER ARCHITECTURAL MODELS AND IMPROVE RESERVOIR CHARACTERISATION INPUT TO RESERVOIR MODELS

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6 December 2011
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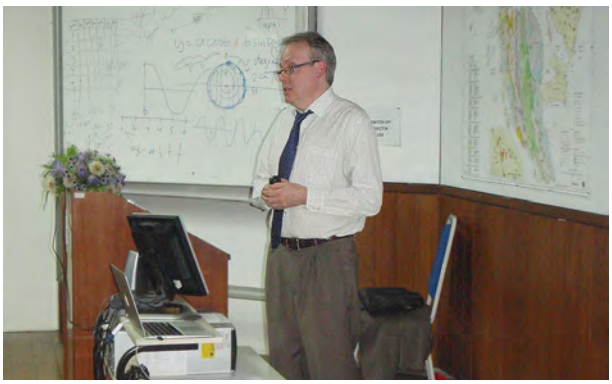

Abstract: Digital outcrop analysis using LiDAR (light detection and ranging), offers a technique to develop a better understanding of depositional systems and the definition of geobodies and architectural elements for input to reservoir models. The presentation will discuss typical workflows and methodologies to improve digital outcrop studies, and present a number of detailed case studies, that highlight the collection of a full suite of sedimentological data and resultant statistical analysis. The results provide improved statistical data of the chosen reservoir intervals and have an impact on reservoir models in these types of systems.

The studies have been carried out using LIDAR, differential global positioning system (DGPS), digital photogrammetry (using multiple digital images to reconstruct three dimensional information) and detailed outcrop logging. The dense dataset allows the mapping of facies, geological object distribution and architecture.

The Manchester Petroleum Geoscience Centre (PGC) has unique facilities and research expertise to form the base for quantitative outcrop data collection, proprietary software available to the group include Polyworks ™, PetrelTM, GeoFrame®, VoxelGeo®, ArcInfoTM among others. We have also developed student in-house software Virtual Reality Geological Studio (VRGS) which enables rapid integration and interpretation of acquired digital outcrop data, and transfer to Petrel or similar software for mapping and interpretation.

Two recent example studies will be presented; integrated research on the Early Triassic of Morocco and Eastern Canada, to better understand the depositional systems and develop high resolution reservoir models of the fluvial systems; and research on fractured carbonates, using LiDaR data to better quantify fracture orientation, density and address the controls on fracture distribution in Miocene aged limestones from the Sinia of Egypt.

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Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 37, No. 3-4, July-December 2011