

## AN INTEGRATED PETROPHYSICAL EVALUATION FOR RESERVOIR CHARACTERIZATION AND MODELING IN FIELD DEVELOPMENT

### Abstract:

It has been known that an uncertainty of original hydrocarbon in place is one of main challenges for reservoir development. Reservoir complexities such as compartment, multi layers and fluid variation create more uncertainty in petrophysical evaluation and reservoir modeling. Therefore, a reliable reservoir characterization and estimation of fluids in place is important in field development plan to minimize the risks. It requires an integrated approach of all available data from special core analysis (SCAL), openhole logs, geology, geophysics, reservoir rock typing (RRT), reservoir pressure, saturation height model (SHM) and fluids sampling analysis.

An integrated petrophysical evaluation have been studied and used in reservoir characterization. Openhole logs and core data have been utilized with quality control in the evaluation. A reliable permeability approach log has been developed from porosity, clay bound, pore size, core and mobility data. It has used the SHM approach based on integration SCAL-logs data that includes Mercury Injection Capillary Pressure (MICP), Centrifuge, Porous Plate, Relative Permeability data for every RRT and variation fluid contacts. An initial water saturation and residual oil saturation from SCAL data have been used in evaluation. Reservoir pressures and cased hole logs have been used to verify fluid contacts and water saturation changes in reservoirs during production.

The integrated evaluation approach of reservoir characterization has provided a reliable result for reservoir modeling and field development. It is useful for assurance of reservoir development plan, optimization and reservoir management.

### Bio:



**Muhammad A Gibrata** currently works as Senior Reservoir Petrophysicist and Subject Matter Expert in Dragon Oil (ENOC). He has 22 years of experiences in oil and gas Industry. He has a Doctor of Philosophy (PhD) on Petroleum and Gas Engineering. He has experiences in petrophysical evaluation, integrated reservoir characterization, digital rock physic, enhanced oil recovery (EOR) study, field development plan of sandstone and carbonate reservoirs. He worked previously with Schlumberger, Petronas and Abu Dhabi Oil Company (ADCO). He published and presented many technical papers at SPE, IPA, SPWLA & IATMI technical conferences, and he is also technical paper reviewer of Transport in Porous Media (TIPM) Journal. He is currently vice president of technology in SPWLA-Dubai and vice IATMI of UAE.