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Facies-Based Petrophysics

This presentation describes 'an integrated workflow' that revolves around a 'shared earth model' as the essential component. Key to this workflow is the role of the petrophysicist in facilitating the integration of other disciplines in the reservoir characterization team and capitalizing on their in-depth knowledge of multiple data types. The efficient integration of data is the key to productivity, reduced cycle time and reduced reservoir risk.

Petrophysics provides the key link from geoscience to engineering through prediction of facies, rock types or flow units from wireline logs and core description. These facies are then distributed within the geoscience earth model and populated with petrophysical properties used to calculate hydrocarbons-in-place. Identification of flow units with their intrinsic permeability values are the key input to the reservoir simulator This role is becoming essential as new integrated 'shared earth model' packages are facilitating change in the way we characterize reservoirs.

The role of the petrophysical practitioner is to integrate all data – not just logs – with the goal of reducing risk or uncertainty in the in-place hydrocarbon calculation. The essential step is to integrate geological and sedimentological data into the workflow. This talk summarizes a workflow that includes these data as the fundamental input. Key to this workflow is the prediction of a core based 'facies' curve which can be applied using wireline log data based upon a set of simple rules. Once created, this electrofacies curve is used throughout the whole evaluation process as a discriminator – from hydrocarbon-in-place parameter calculation to permeability prediction.