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Combining dipmeter measurements and formation imaging to improve reservoir characterization

Geoscientists exploring and drilling for hydrocarbons have at their disposal an arsenal of technically advanced tools to evaluate reservoir potentials and minimize risks in this very costly industry. More are being developed all the time. However, many geoscientists have overlooked the advantages of combining older technology with newer.

For many years, dipmeters have been the standard in the industry for generating tadpole data that geoscientists use for structural and stratigraphic interpretation. These tools were later modified to produce imaging capabilities when used with a fresh mud system. Furthermore, in recent years, the increased use of oil-based mud systems created the need for additional modifications of dipmeter tools. Oil-based imaging tools provide the geoscientist with both tadpole data to interpret structural dips and an electrical image to help visualize the borehole. These detailed electrical images improve structural interpretation (e.g., unconformities, faults and fractures recognition, and vugs) as well as stratigraphic interpretation (e.g., orientation and features of sedimentary structures, determination of depositional environments, etc.).

Case studies have shown that electrical image data combined with dipmeter data can find potential pay that otherwise might have been left behind. Older methods have earned deserved recognition among the industry. Combining proven techniques with the newest technologies allows the geoscientist to make more confident decisions.