



GEOGULF2021

A U S T I N
October 27–29, 2021



Managed Pressure Drilling Enables Dynamic Formation Evaluation for Calibration of the Estimated Pore Pressure: A Review

N. Kulkarni

ABSTRACT

Formation pore pressure (PP) is one of the most critical parameters for well planning and drilling operations. Methods for estimating formation pore pressure are (1) prediction before drilling, (2) estimation while drilling and (3) verification after drilling. Several empirical methods are available for determining pore pressure. Although these empirical methods are routinely used for pore pressure estimation, they always need to be calibrated due to uncertainty and it is a common practice to calibrate these methods while drilling. Conventionally these calibration points are based either on the occurrence of kicks, in which case the pore pressure in the sand producing the kick must be higher than the equivalent mud weight of the drilling fluid and lower than the kill mud weight. Observations of instabilities in shales is also considered another calibration point as in this case the assumption is that the mud weight has fallen below the pore pressure.

During conventional drilling it is not always possible to calibrate the data as such events are always prevented. With managed pressure drilling (MPD) and an advanced automated control system, it is now possible to adjust the equivalent mud weight in the wellbore by manipulating the surface back pressure from the drilling choke. MPD thus enables performing dynamic pore pressure tests to calibrate the available predicted pore pressure data points, while drilling.

The procedure can be implemented at different points of interest within the open hole section, while drilling and with minimal interruption to the drilling process.

NOTES
