

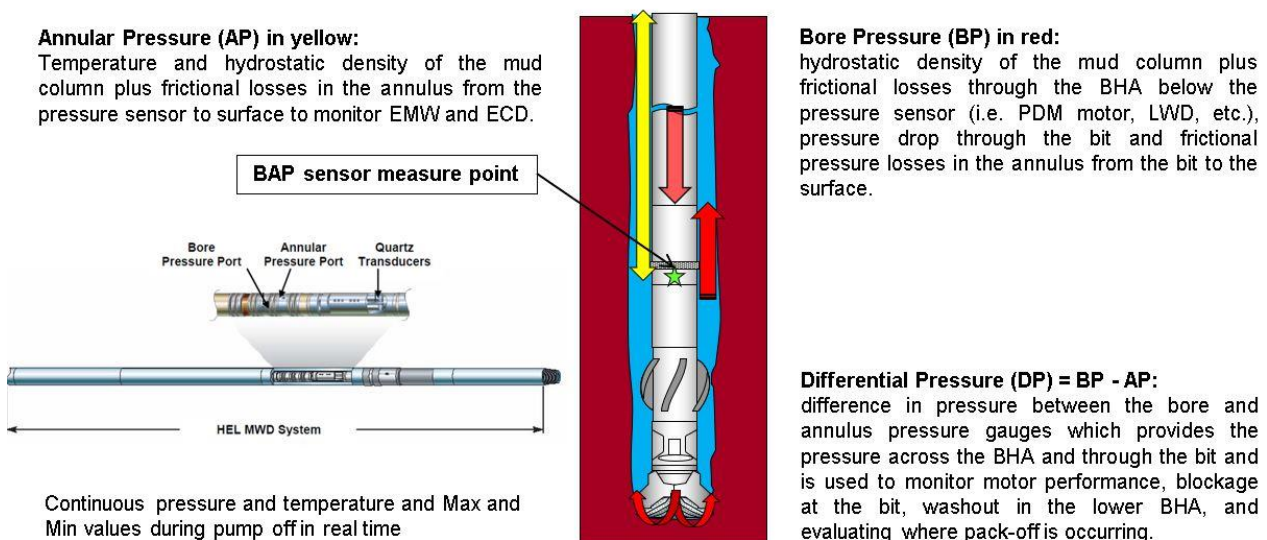
Ultra-high Temperature Logging-While-Drilling Tools and Pressure-While-Drilling (PWD) Applications in High Temperature Geothermal Wells

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The use of directional drilling in a geothermal field is usually dictated by various objectives: geological targets, for example to intersect as many or as less formation fractures as possible, or the perimeter lease boundaries, institutional, legal, or topographic issues, and lastly but with major economic efficiency importance, it allows to drill several wells from one prepared site while avoiding collisions. The difficulties inherent in directional drilling are aggravated in the geothermal wells because of 2 major reasons: the electronic tools and elastomer elements in the motors are susceptible to high temperature. Within this abstract it is presented a new set of high-temperature Logging-While-Drilling (LWD) and Pressure-While-Drilling (PWD) technologies for operating unshielded electronic components up to 210°C. In particular, the BAP tool, a high temperature PWD sensor that provides bore and annular pressure and temperature, that was used in some high enthalpy deviated geothermal wells where lost circulation was expected, mainly related to the presence of natural highly productive fracture system.

In addition to the applications commonly used in wells, the real time and cost-effective measurement of downhole pressure and temperature was attempted to be used to better understand hydraulic conditions of the reservoir, improve accuracy in fracture characterization and position, and prevent downhole equipment damage or NPT. In particular, the combined analysis of downhole pressure and temperature trends, measured by the BAP sensor, is used to discriminate between “open” versus “closed” circulating system (or “hot pot”) and position the losses and fracture, which are all valuable data for drilling and completion plans. Although there are multiple variables to take into consideration, the concept proves to be valuable and deserves further discussion and case history.



What does BAP measure?

References:

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