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Microchip Tracer Power Supply Technology and Downhole Testing

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ABSTRACT

A tracer,with its working performance affected greatly by the power supply,sometimes cannot collect a complete set of downhole data constrained by the source.In order to solve this problem,a power supply plan was designed using rechargeable lithium batteries as the source and the wireless charging technology to charge the battery.Through charge-discharge experiments,the relationship between charging voltage and transmission voltage,central distance of coils,and charging time,and the effects of high temperature on the discharge properties were researched.Research results showed that transmission voltage interacted with the central distance of coils.In theory,when the transmission voltage was much lower and the charging distance much longer,the charging voltage should have failed to reach the charging demands.However,on the contrary,the excessive charging voltage could result in an exploding battery due to overcharge.And,while a long charging time could assure good charging effects,the field operation duration should be further lengthened,because an overly brief charging time could also cause the inadequacy of charging;under high temperature,and thus the lithium battery could experience accelerated discharge especially compared with batteries under normal temperature.Furthermore,the field downhole tests indicated that the tracer designed as the new power supply plan could collect all temperature data for the whole wellbore.Therefore,adopting the power supply plan in this type of tracers could solve the power supply problems.