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Ortenauhalle Kongress 1
Tiefe Geothermie

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Deep geothermal energy



Split Happens: Unlocking Flow Rate Efficiency with Multi-Activation Circulating Subs in SplitFlow Mode

Split Happens: Effiziente Durchflussraten durch Multi-Aktivierung von Zirkulationssystemen im SplitFlow-Modus

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This paper explores the innovative application of Split Flow using multiple activation circulating subs to enhance drilling performance across recent geothermal and conventional operations in Europe. While the benefits of circulating subs are well-established, the strategic use of SplitFlow—where drilling fluid is partially diverted from the BHA directly to the annulus—has demonstrated significant improvements in flow rates, annular velocity, and system cooling bringing huge benefits for operators.

Drawing on recent field data from high-profile Geothermal wells in Poland, and conventional wells in the UK, and Romania, this paper presents a practical evaluation of Split Flow to deliver hydraulic efficiency, hole cleaning, and bottom hole assembly (BHA) cooling.

This paper contributes novel insights to the existing literature by demonstrating how SplitFlow can be tailored to meet specific well objectives, offering practicing engineers a flexible and effective tool for improving drilling efficiency and reducing operational costs.

The use of Split Flow has been used in variety of high profile applications in the past 3 years, especially in Europe and more recently on Geothermal wells in Germany, The Netherlands and Poland. The system is flexible and tools are set up and deployed based on the desired outcome; for example, cooling BHA components in hot geothermal applications would require a different set up to one which requires maximizing hole cleaning. There are also potential further benefits to adapting circulating subs to be used in split flow mode such as a resulting reduction in ECD and a reduction in pump pressure.

The paper will review the real results from applying Split Flow in three recent applications in detail covering different hole sizes and different client objectives;

- Flow re-distribution in Poland's deepest Geothermal well.
- Increasing annular velocity in North Sea, UK

- Feeding RSS / MWD with optimal flow rate, Romania.

Flow re-distribution

Split Flow was chosen in the 5 7/8" section to dampen the hydraulic impact force of the fluid at the bit and formation interface, yet redistribute the total flow across the system and boost the annular velocity higher up the string. The overall flow rate remained the same during the drilling, but instead of 100% out the bit, it was reduced to 66% at the bit and 33% out the tool.

Increase Annular Velocity

Split Flow has been adopted in a long-term project in the UK and is now used in two hole sizes to increase flow rates to a level which are not possible while drilling. We will show how using a 60% / 40% split it has been able to provide a 93% increase in Annular Velocity in the 13 3/8" casing, a 12-15% increase in flow rate in the 17 1/2" section, time and cost savings by avoiding a dedicated BHA trip, and no cleanout run.

Feeding RSS / MWD with optimal flow rate

Split Flow has been used while drilling ahead to provide the BHA the flow rate it needs to to perform to its optimum, while providing the drilling system more overall flow to evacuate cuttings and clean the hole. This flow rate is not possible while drilling 100% through the bit.

TBC: In 2025 we also had a "trial" with Eavor in Germany and we are about to start again – so we may be able to share more as things progress.

This paper practically demonstrates over a sequence of successful operations to show how application of SplitFlow system can improve hole cleaning and deliver well objective and help Geothermal operators unlock flow rate efficiency.