FlairFlex advanced real-time fluid logging and analysis service

Provides a while-drilling surface-formation evaluation method for early detection and quantification of hydrocarbons

Where it is used

FlairFlex* advanced real-time fluid logging and analysis service was developed for conventional and unconventional plays to perform formation evaluation and reservoir characterization in all well and reservoir types while drilling.

How it improves wells

The FlairFlex service enables better infrastructure planning and provides crucial information before downhole sampling or well testing is possible, rather than making exploration and appraisal campaign decisions using limited data from conventional sources. The same is true for wireline sampling operations, which can be optimized using continuous fluid logs from the FlairFlex service.

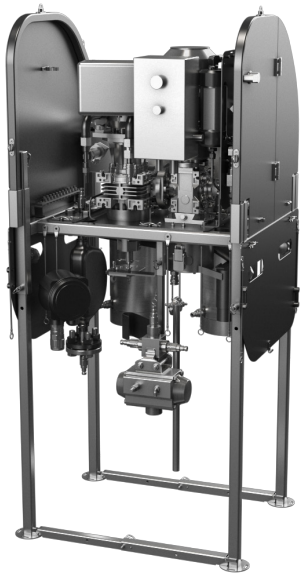
Additionally, FlairFlex service assesses interwell and intrawell reservoir fluid characterization and connectivity while drilling, improving geosteering decisions for more precise well placement. In unconventional plays, FlairFlex service is the only information source for the fluid type and composition before production starts.

How it works

The core of the system is the fluid extractor, which samples hydrocarbons transported to the surface by drilling fluid under controllable and repeatable conditions. This new design streamlines service delivery, simplifies maintenance, and increases measurement quality. Two such fluid extractors are installed with the FlairFlex system on the out- and in-drilling-fluid lines. Hydrocarbons extracted from both the outbound and inbound lines are subsequently analyzed and quantified using a gas chromatograph and mass spectrometer (GCMS). The first extractor unit captures and measures hydrocarbon content from the outbound line when drilling fluid reaches the surface. A real-time hydrocarbon out log is generated and available for remote transmission.

Degassed and cleaned hydrocarbons from the inbound line are analyzed and quantified by the GCMS. Subsequently, they are subtracted from the hydrocarbon out so that the hydrocarbon recycling effect is eliminated and only fluids coming directly from the formation are interpreted.

During analysis, automated interpretation workflows are implemented using the Techlog* wellbore software platform to enable quick integration of data from different sources, such as petrophysics, pressure, and sampling measurements while drilling and on wireline. In addition to traditional composite logs, the FlairFlex service can be integrated into models from the Petrel* E&P software platform. A team of experts supports the service during prejob, execution, and postjob analysis, without adding personnel to run the service.



The FlairFlex system integrates two fluid extraction units—one at the inbound drilling fluid line and other at the outbound line.

What else I should know

Combined with the isotope logging service, the FlairFlex service provides enhanced characterization of cogenetic hydrocarbon fluid, fluid and source rock maturity, mixing trends, secondary processes, and fault transmissibility. FlairFlex service is compatible with SpectraSphere* fluid mapping-while-drilling service. And data gathered continuously and in real time by FlairFlex service provides a continuous-with-depth fluid composition profile for optimizing downhole fluid analysis and sampling depths.

Gas Extractor Specifications	
Type	Constant volumetric and heating
Heating temperature, degC [degF]	70 [158], water-based mud 90 [194], oil-based mud
Gas line pressure	Near vacuum
Flow line	Closed with dedicated adapter
Certifications	ATEX, IECEx, NORSOK
Gas Detector Specifications	
Type	Gas chromatograph and mass spectrometer
Gas measured	C_1–C_8, benzene, toluene, DMC4, CC5, CC6, MCC5, MCC6, Lump x1, Lump x2, H_2, He, CO_2
Cycle time	70 sec (C_1–C_7); 90 sec (C_1–C_8)
Limit of detection	1 ppm
Carrier gas	Air

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