Russian Well Logging Optical Cable Technology



Overview

Optical fiber logging cable is a type of cable used in oil and gas well logging applications. It is designed to provide high-speed data transmission over long distances in harsh environments.

Key Takeaways

Russian well logging technology increasingly integrates fiber-optic cables for real-time geophysical measurements, enabling advanced diagnostics and operational efficiency in oil and gas wells.

Overview of Optical Cable Logging in Russia

Russian well logging has evolved to incorporate fiber-optic communication channels in coiled tubing (CT) systems, allowing real-time data transmission from downhole instruments to surface computers. This approach, known as Fiber-Optic Enabled Coiled Tubing (FoECT), enables simultaneous conventional and production logging applications, reducing the need for separate logging runs and minimizing operational costs, especially in offshore or remote wells (CTTimes, 2010).

Technical Features

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Telemetry and Data Transmission: Fiber-optic cables embedded in coiled tubing transmit high-resolution geophysical data, including pressure, temperature, and flow profiles, directly to surface systems. The optical signal can be converted and transmitted wirelessly to portable computers, eliminating bulky conventional acquisition equipment (CTTimes, 2010). Integration with Conventional Tools: The system supports standard production logging tools (PLTs) in real-time mode, providing the same quality measurements as traditional wireline logging while allowing simultaneous well intervention operations (CTTimes, 2010).

Operational Advantages: Using fiber-optic cables reduces mobilization and logistics costs, shortens intervention time, and allows for accurate diagnosis and treatment of well conditions in a single operation. It is particularly beneficial for wells requiring acid stimulation or other treatments where conventional wireline cables may limit pump rates or risk equipment integrity (CTTimes, 2010).

Domestic Development and Software Support

Russian companies, including Rosneft, have been actively developing high-tech well logging methods and associated software platforms. Key initiatives include: Unified Metrological Corporate Centers: Ensuring high accuracy of geophysical equipment to match international standards (OnePetro, 2019). Pilot Testing and Multifunctional Approaches: Technologies undergo comprehensive field trials with inter-functional team collaboration to refine equipment and software (OnePetro, 2019).

Corporate Software Packages: Integrated platforms for interpreting logging data and managing information securely, supporting both drilling and post-drilling operations (OnePetro, 2019).

Applications

Land and Offshore Wells: The technology has been successfully applied in land water injection wells and is suitable for offshore platforms and remote fields where operational costs are high (CTTimes, 2010). Well Intervention and Diagnostics: Enables real-time evaluation of well geometry, injection profiles, and treatment effectiveness, supporting decisions to optimize production and well performance (CTTimes, 2010).

Conclusion

Russian well logging optical cable technology represents a significant advancement in geophysical measurements, combining fiber-optic telemetry, coiled tubing deployment, and integrated software platforms. These systems enhance operational efficiency, reduce costs, and provide high-quality real-time data, positioning Russian oilfield services at a competitive level with international geophysical logging standards.

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Article Content

Cable Logging? Optical Fiber Logging?--JASON is ready for you!

Utilize optical fiber sensor instead of electrical-based sensor for logging operations, and use optical fiber composite loaded detection cable or optical fiber goes through stainless steel tube for signal

Well logging – UNGF

AKS NAUTILUS is the self-contained cable system for wireline or pipe-conveyed logging: laterolog, SP, resistivity, fullwave sonic, gamma-ray, neutron gamma, thermal neutron (CNL/TNPH), RHOB,

Transformation of well logging methods – transition to ...

One of the key milestones of this project is the creation of Geophysics Management Center where all well studies and operations will be managed by highly skilled specialists in a unified digital

The effectiveness of downhole distributed fiber-optic ...

Having passed the path from the pilot jobs to a couple of dozens of DTS installations in horizontal wells in recent years, Gazprom Neft have mastered this innovative technology for the first

WELL LOGGING IN RUSSIAN FEDERATION: STATE-OF-THE-ART

The conformity of Russian computer well logging technologies to world standards was verified for many times in the comparative tests made by Russian and leading world geophysical companies in various

Optical fiber logging cable Special cable

Optical fiber logging cable is a type of cable used in oil and gas well logging applications. It is designed to provide high-speed data transmission over long distances in harsh environments.

Contemporary Technologies of Production Logging in Horizontal

These technologies can significantly reduce costs and risks for oil and gas producing companies compared to conventional logging methods. The objective of the present study was to

The High-Temperature Resistant Well Logging Optical Cable

Suitable for oil wells, gas wells, coal mines or under high temperature conditions. The cables marked with Dry; They are a series of cables in which the typical water blocking the intermediate tubes

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Considering the effect of the logging cable stretching under the ...

The technology of carrying out various geophysical studies of oil wells using a carrying well-logging cable for the delivery of geophysical instruments and equipment is considered in the article.

Production logging via coiled tubing fiber optic ...

Production logging technology, a near-wellbore method, measures the fluid flow profile of production wells and discerns the properties and flow rates of produced or inhaled fluids in each ...

The Optic Oil Field: Deployment and Application of Permanent In-well ...

Recent developments in fiber optic sensing technology have resulted in reliable alternatives to conventional electronic systems for permanent, downhole production and reservoir

How Fiber Optics Are Used in the Oil & Gas Industry

DTS technology uses optical fibers to measure temperature variations along the entire length of a fiber optic cable. These technologies provide valuable insights

Hybrid Electro-Optical Cable for Coiled Tubing Logging and ...

This study presents the evolution of downhole fiber optics to a new hybrid electro-optical cable for coiled tubing (CT) applications. The optical fibers enable optical communication and

Advanced technologies of well logging and data analysis (Russian)

The PDF file of this paper is in Russian.A brief analysis of the situation, the necessary actions and mechanisms for the development of domestic technologies for geophysical research of

Efficiency of Coiled Tubing Well Interventions Increased by ...

The ACTive Power CT real-time powered downhole measurements system delivers continuous fiber-optic data and power from surface through a hybrid electro-optical cable installed in

(PDF) A Review of Distributed Fiber–Optic Sensing in ...

In the oil and gas industry, distributed fiber-optic sensors can provide significantly valuable information throughout the life cycle of a well and can monitor pipelines transporting

Application of fiber optics in oil and gas field development ...

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Current research status on ber optics revealed that certain chal- lenges are still limiting the application of ber optics in oil eld operations. In the future, ber optic technology will provide valuable data and

Application of Electro-Optical Hybrid Cables in Horizontal Well ...

This paper mainly introduces the unique structural features and various applications of the electro-optical hybrid cables which were deployed into downhole with the help of coiled tubing technology. Fiber

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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