German Downhole Temperature Measurement Optical Cable Technology

Preview

Distributed fiber optic temperature and strain sensing technology are used to measure thermal as well as load signatures during the completion of a low-enthalpy well for geothermal energy storage (Gt BChb1/2015, ATES Fasanenstrasse, Berlin, Germany). INTRODUCTION Casing and cement integrity is essential to assure safe operations over the lifecycle of geothermal wells. Especially in the context of high enthalpy geothermal wells, the well architecture has to withstand large temperature and pressure variations during production/injection. requires specialized equipment. De nstallation types are possible., 202 which is fa l can be performed at any time. A semi-per ole after drilling is finished. This contribution focuses on the potential of real-time downhole monitoring techniques along fiber optic cables which are permanently installed behind. Conventional measurement systems: usually based on electronic sensors. variation of refractive index, written into fiber core, using UV light. Paper presented at the SPE Offshore Europe Conference & Exhibition, Virtual, September 2021. Fiber Optic (FO) sensing capabilities for downhole monitoring include, among other techniques, Distributed Temperature Sensing (DTS) and Distributed Acoustic Sensing (DAS). The appeal of DTS and DAS data is.

It provides many benefits, such as the ability to perform different measurement types (e.g., temperature, acoustic, strain) using a single cable with multiple fibers. Additionally, it enables simultaneous

We installed fiber optic cables into a geothermal production and injection well and used DTS data measured after drilling and during shut-in after cold water injection to observe the

An experimental study was conducted to validate the field observations. Using distributed strain sensing, we can extract relevant downhole information (such as fluid/material changes) in real-time without

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Apart from boreholes, fiber-optic sensing also opens up new possibilities for geophysical measurements at surface, especially since extensive networks of fiber-optic cables for telecommunication and data

16 wellbore fiber-optic installations can be conducted by mounting the sensing cable to a rigid structure ontrolled landing of the cable. We analyze a 18 geothermal well with a 3.6 km long fiber-optic

In the presented project, three boreholes of a seasonal geothermal energy storage with a vertical depth of down to 500 meters were instrumented with distributed fiber-optic sensors.

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Optical time-domain reflectometry (OTDR): measurement of backscattered light for many sampling points along fiber. Phase-OTDR: phase of backscattered light changes as the fiber is stretched, e.g.

In Germany"s largest geothermal project, a fiber-optical cable was permanently deployed to total depth together with a pressure sensor located 50m above the reservoir.

To analyse the downhole performance of mud displacement and cement slurry during the cementing processes, this work focuses on real-time well monitoring technologies using fiber optic cables which

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