Wireline High Temperature Tool

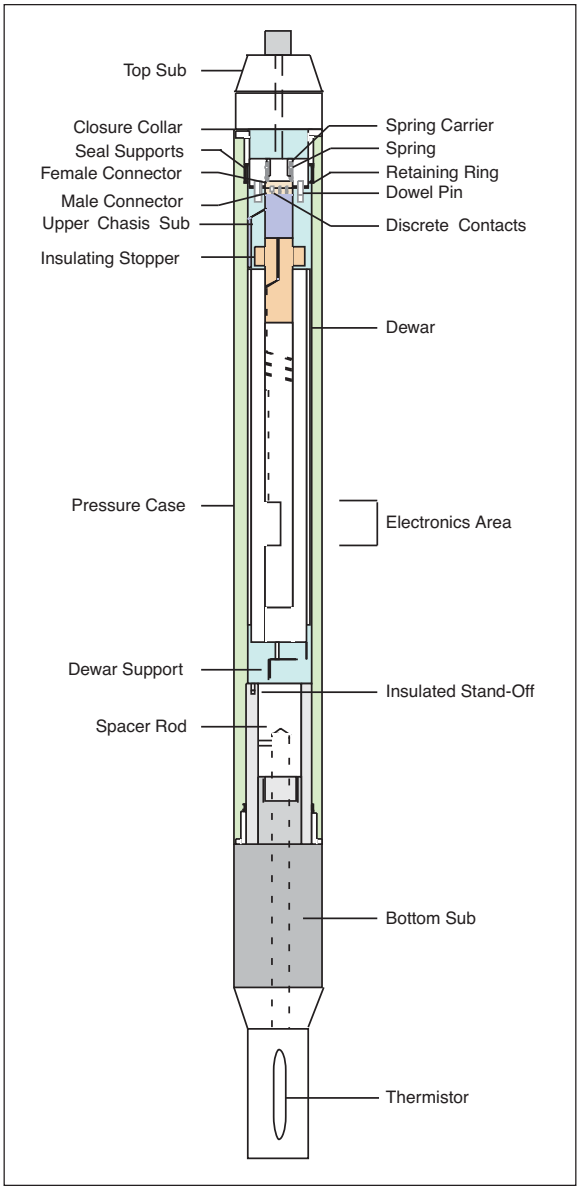
Description

In high temperature environments (such as hydrothermal systems or lower crustal settings), temperature logs can be recorded using the Wireline Slim-Hole Hi-T Temperature Tool (HTT) developed at LDEO. The HTT can be used in temperature conditions up to 275°C. The HTT is a wireline tool that does not have internal batteries; therefore, it is dependent on the wireline for tool power and data transmission. Logging cable with Teflon insulation will begin to degrade beyond 232°C. Generally, this could present a problem after extended use in temperature conditions exceeding 235°C. However, the HTT system can still transmit reliable measurements even after the cable has been considerably degraded. The HTT's telemetry system is frequency, not amplitude, dependent.

Applications

- Hydrogeological analysis - identifying regions of fluid in/ out flow
- Geothermics - estimating the vertical heat flow regime
- Safety - evaluating fluid temperature prior to deploying heat sensitive tools

During assembly, the electronic components of the HTT (right) are placed inside the pressure case.



Schematic illustration of the Wireline Slim-Hole Hi-T Temperature Tool.

Specifications

Length:	3m (9.84 ft)
Weight:	250 lbs (113.4 kg)
Diameter:	3.5 inches
Temperature resolution:	0.5° C
Temperature rating:	275° C
Cable head:	Schlumberger style (adaptable to Gearhart Owen)

OCEAN DRILLING PROGRAM

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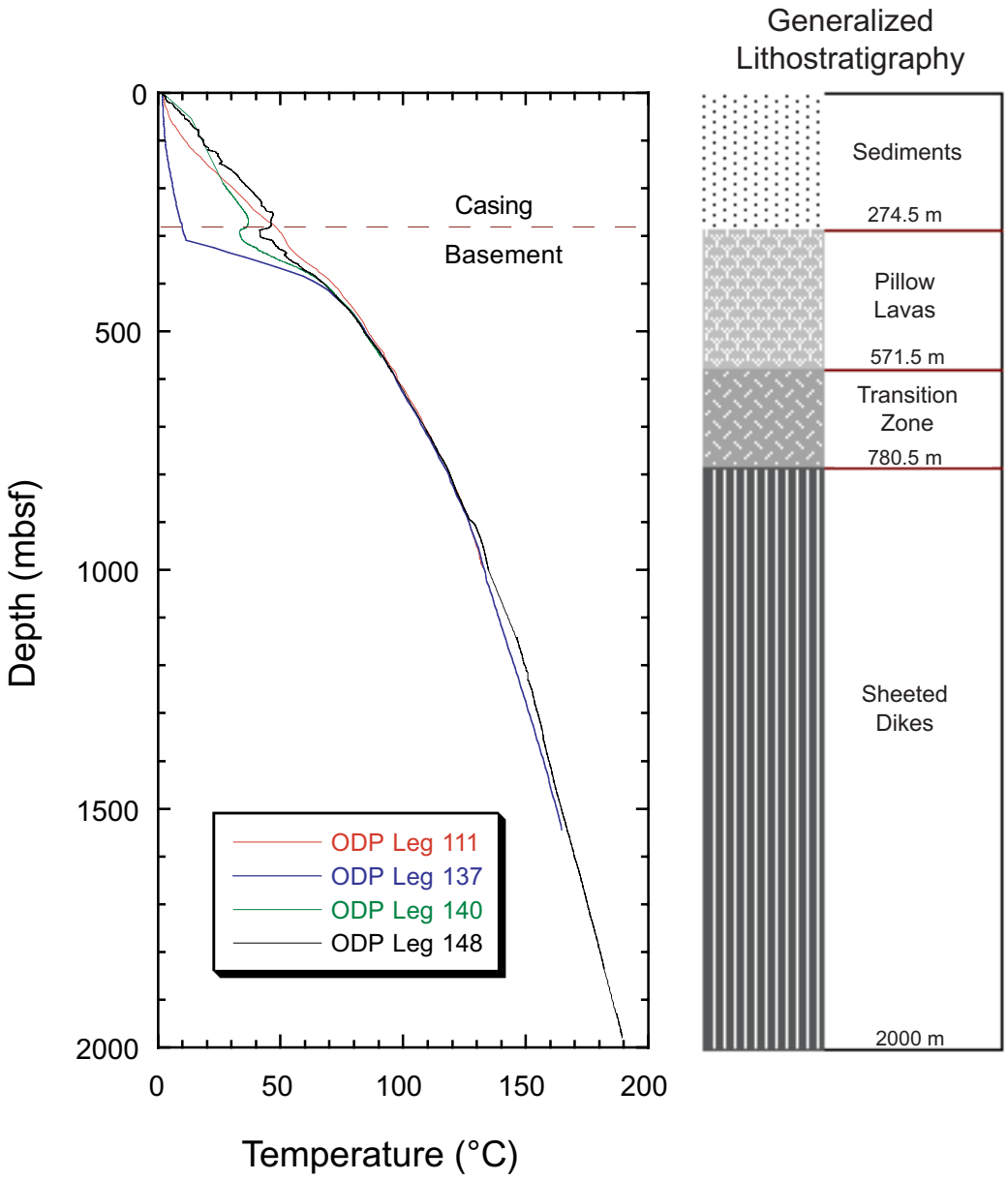
Hole 504B - Costa Rica Rift



The HTT provides a measurement of temperature versus depth. Typically, boreholes will exhibit a natural hydrothermal gradient that increases with depth; therefore, borehole fluid temperatures will tend to increase with depth. Variations in this gradient can often be associated with changes in the heat flow regime as well as borehole fluid movement. In the above example, high temperature data acquired with a precursor to the HTT (the Gable Hi-T tool) demonstrates the capabilities of this type of temperature probe.