Scientific Application

The SEdition Temperature Pressure (SETP) tool is designed to take temperature and pressure measurements in semiconsolidated sediments. The SETP evolved from the Davis-Villinger Temperature Pressure Probe (DVTPP), named for its creators. The old DVTPP name is still sometimes used for the new SETP tool.

Operation

The SETP is wireline deployed using the Collected Delivery System (CDS). The CDS allows the SETP to decouple from the drill string, which prevents damage to the tool during sediment penetration. After the driller picks the drill string up off the bottom ~5 m, the CDS/SETP is placed in the drill pipe and run downhole, where it lands and latches into the Bottom-Hole assembly (BHA). The SETP extends 4.4 m beyond the bit prior to insertion into the sediments at the bottom of the hole. The driller slowly lowers the drill string while the CDS/SETP retracts 3.3 m into the BHA, at which point the probe begins taking load as it penetrates the formation. The smooth tapered probe tip is designed to create a seal against the sediments as it is pushed in so that in situ pressure measurements can be recorded. Typical recording time for the tool in the sediment is 20 min. After pressure measurements are recorded, the tool is retrieved by wireline and the entire SETP tool is moved to the laboratory for data download.

Features

Compatibility

The tool latches into either the Advanced Piston Corer/Extended Core Barrel (APC/XCB) or Rotary Core Barrel (RCB) BHA, increasing usability.

Decoupled from Heave

The SETP is deployed on the Collected Delivery System, which allows the probe to be disengaged from the BHA.
after it is pushed into the sediments. This minimizes the effect of drill string movement (from ship heave) on the probe’s temperature measurement.

**Data Collection**

The tool is capable of storing three channels of analog data at 1 Hz and one digital input of acceleration data for 45 hr. This provides sufficient measurement detail and recording time to assure good quality data.

**Specifications**

**Temperature Measurements**

Analog thermistor data
Range: 0° to 110°C
Resolution:
—0.002°C below 20°C
—better than 0.005°C below 60°C
—0.0025°C at 100°C

**Acceleration Measurements**

1 digital 3-axis acceleration sensor
Range: ±2 g
Resolution: 0.01 g
Frequency: 10 Hz

**Pressure Measurements**

Range: 0 to 8,000 psi
Resolution: 0.01 psi

**Communications**

Standard 3-wire RS-232 serial link

**Data Storage**

45 hr of data on 128Mb flash memory card

**Physical Dimensions**

Probe Tip: Conical, continuously tapered at 2.5° from 55.5 to 8 mm in diameter
Tool: 82 cm long, 6.7 cm ID

**Operating Range**

**Formation**
Soft to semi-consolidated sediments (e.g., chalks or firm clays)

**Temperature Range**
-20°C to 75°C

**Maximum Depth**
5600 m (equivalent to ~8000 psi per lab testing)

**Limitations**
Not used in hard rock (e.g., chert, dolomite, limestone, or basalt)