**Scientific Application**

The Sediment Temperature (SET) Tool is designed to take temperature measurements in sediments too consolidated to use the Advanced Piston Corer Temperature-3 (APCT-3) tool. The SET evolved from the Davis-Villinger Temperature Probe (DVTP), named for its creators. The old DVTP name is still sometimes used for the new SET tool.

**Operation**

The SET is wireline deployed using the Collected Delivery System (CDS). The CDS allows the SET to decouple from the drill string and provides a feature to prevent damage to the tool during sediment penetration. After the driller picks the drill string up off the bottom ~5 m, the CDS/SET is placed in the drill pipe and run downhole, where it lands and latches into the Bottom-Hole assembly (BHA). The SET 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/SET 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 temperature measurements can be recorded. Typical recording duration is 10 min. After temperature measurements are recorded, the tool is retrieved by wireline and the SET 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 SET 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 Recording

The tool is capable of storing three channels of analog data at 1 Hz and one digital input of acceleration data at 10 Hz 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

Communications
Standard 3-wire RS-232 serial link

Data Storage
45 hr of data on 128 Mb 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)

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