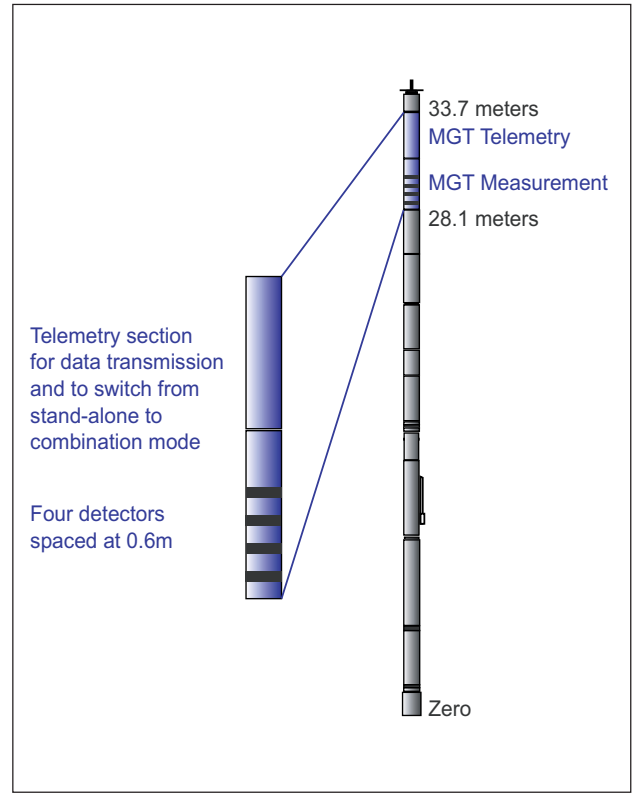


Multi-Sensor Gamma Ray Tool

Description

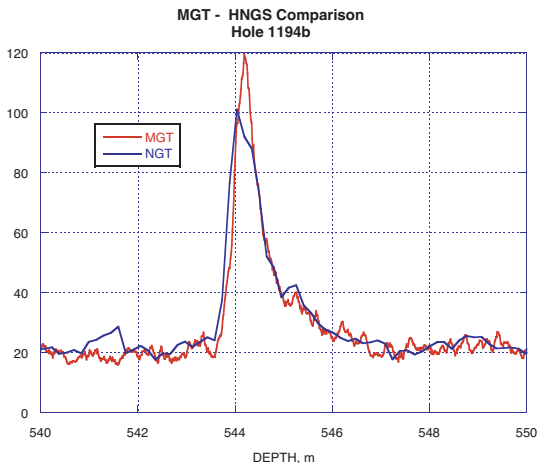
The Multi-Sensor Gamma Ray Tool (MGT) is a complete natural gamma spectrometry system consisting of four gamma spectrometry sensors and a variety of electronics for pulse processing and analysis. Each sensor module includes an NaI detector with an internal calibration source, programmable power supply, digital pulse analyzer, and pulse height stabilization circuitry. Individual calibration results for each sensor are stored in microcontroller memory; thus, the modules are interchangeable and independently replaceable. Spectral data are collected from each of the four individual gamma ray modules, as well as from downhole accelerometer and temperature sensors, and transmitted uphole to the data receiver in a surface panel. The MGT increases the vertical resolution of natural gamma ray log data by a factor of 3-4 over conventional logging tools, allowing for detailed characterization of thin bed layering and sedimentary cycles when their gamma ray response is sufficiently large.



Schematic diagram of the Multi-Sensor Gamma Ray Tool.

Applications

- ◆ Clay typing
- ◆ Mineralogy
- ◆ Ash layer detection



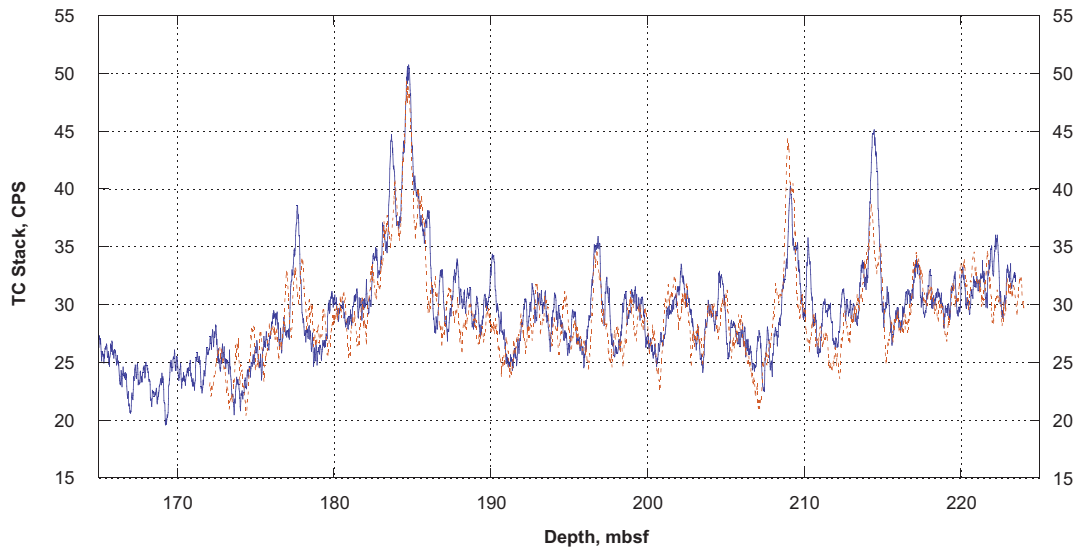
Logs from the MGT show more finely layered structure than those of standard gamma tools, which can exhibit pronounced smoothing effects due to their bigger detector size and lower sampling rate

Specifications

Weight:	350 lbs (159.1 kg)
Length:	
Telemetry module:	9.0 ft (2.75m)
Measurement module:	9.5 ft (2.90m)
Diameter (without centralizers):	3.375 in. (8.57 cm)
Maximum temperature:	100° C
Maximum pressure:	10,000 psi
Number of gamma-spectrometry modules:	4
Module spacing:	0.64 m
Detectors:	
Type:	NaI (TI)
Dimensions:	4 in. x 2 in.
Spectral measurement range:	0.2 - 3.0 MeV
Spectral resolution:	40 KeV
Maximum cable length:	40 ft
Cable head connection:	Schlumberger style
Maximum logging speed:	900 ft/hr.



Hole 1179D
MGT Main and Repeat Run



The data repeatability of the MGT is excellent, as depicted in the figure above.



Deployment of the Multi-Sensor Gamma Ray Tool