Borehole Sonic Array Tool (BSAT) Service

PROVIDES ACOUSTIC FORMATION PROPERTIES AND CEMENT EVALUATION INFORMATION

OVERVIEW

The Halliburton Borehole Sonic Array Tool (BSAT) service integrates two monopole transmitters with an array of five receivers. This tool configuration provides borehole compensation of the P-wave measurement. The full waveform data is digitally recorded for each receiver, thus permitting advanced data analysis and quality control for waveform amplitude, slowness, and arrival time in both openhole and cased-hole applications.

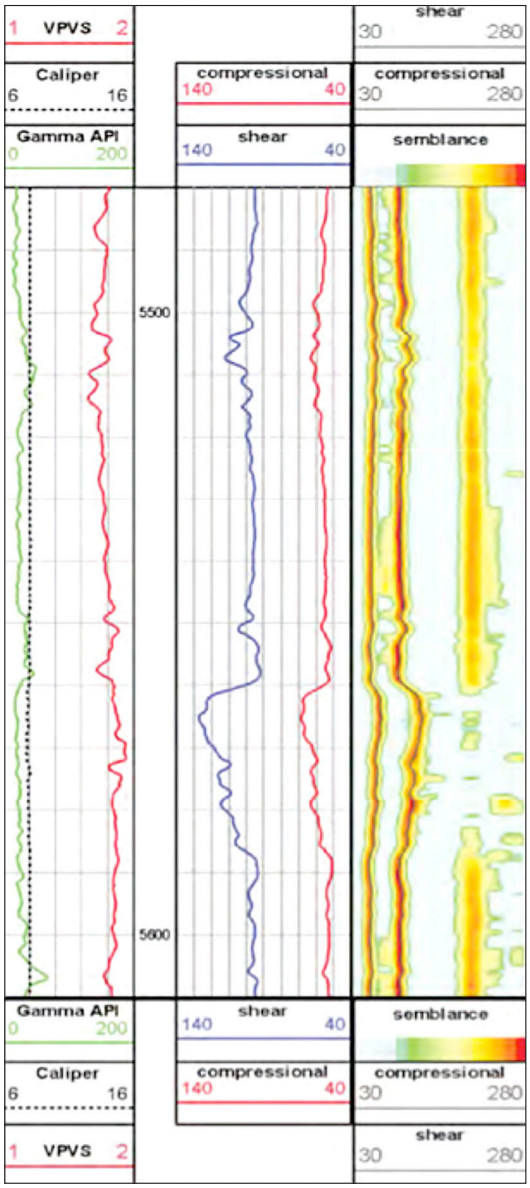
The BSAT tool is over 12 ft shorter than many other acoustic logging tools. While not compromising data quality, the reduction in tool length helps speed up rig-up and rig-down times, especially when lubricator and pressure-control equipment are required.

The P-wave slowness is obtained using a robust waveform cross-correlation coherency process, which uses the waveform data from the entire receiver array. The process evaluates many attributes of the waveform data before selecting, in real time, the acoustic velocities of the formation.

The BSAT tool can also be used for 3 to 5-ft Cement Bond Log-Variable Density Log (CBL-VDL) measurements and can be run in combination with any LOGIQ® tool service.

APPLICATIONS

- P-wave slowness used for sonic porosity determination
- Time-to-depth correlation
- Synthetic seismograms
- Identification of pore-pressure changes
- 3 to 5-ft CBL-VDL measurement
- Instantaneous waveform attributes



Track 1: Gamma ray, velocity ratio (Vp/Vs), and caliper
Track 2: Compressional and refracted shear
Track 3: Semblance with compressive and shear slowness overlaid on the semblance image

FEATURES

- Waveforms can be recorded at high logging speeds
- The P-wave slowness is obtained using a robust waveform cross-correlation semblance process
- Downhole digitization helps eliminate the transmission noise and improve signal-to-noise ratio
- Compression technique allows a high uplink data-transfer rate ratio
- Can be used as CBL tool in combination with any LOGIQ® cased-hole service

Dimensions and Ratings

Max Temperature	350°F (177°C)
Max Pressure	20,000 psi (137.9 MPa)
OD	3.63 in. (92.2 mm)
Length	15.83 ft (4.82 m)
Weight	318 lb (144.4 kg)

Dimensions and Ratings BSAT-UHP (Ultrahigh Pressure)

Max Temperature	350°F (177°C)
Max Pressure	35,000 psi (241 MPa)
OD	4.44 in. (112.7 mm)
Length	16.02 ft (4.88 m)
Weight	480 lb (217.7 kg)

Borehole Conditions

Borehole Type	Open ■	Cased ■		
Borehole Fluids	Salt ■	Fresh ■	Oil ■	Air □
Recommended Maximum Logging Speed at 2 spf	75 ft/min (22.86 m/min)			
Tool Positioning	Centralized ■		Eccentralized ■	

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com