Testing times for drilling systems

A torque sensor from **Sensor Technology** is at the heart of a rig used to test the rotating parts of Well-Guide rotary steerable systems when they return from oil field operations

As well as assuring precise wellbore targeting and reservoir delineation, Gyrodata's high accuracy surveys prevent such problems as missed objectives and wellbore collisions in multiwell structures. The company supplies its survey services to the energy, mining, environmental and construction industries, with manufacturing and test facilities in Houston, Aberdeen and Barrow-in-Furness. At the Barrow plant, it has around 60 Well-Guide RSS (rotary steerable systems) which it dispatches to oil field operations.

The Well-Guide RSS is a fully automated rotary steerable drilling system with 3D automated control near the bit. It can drill highly accurate trajectories using pre-programmed courses with full downhole closed-loop control that allows real time trim steering during the drilling operation. The result is that survey and extraction drilling is more predictable and reliable.

A key operation in the overhaul process is torque testing the rotating parts

A typical job lasts about two weeks, and when the kit comes back there is an intensive two weeks completely rebuilding it. A key operation in the overhaul process is torque testing the rotating parts – any variation from tight torque tolerance specifications suggests that there might be something needing attention. Here, a specialist rig featuring Sensor Technology's TorqSense is used.

In operation, the Well-Guide is loaded into the rig. It is switched on and a suite of tests are run at different speeds. The data is collected on the fly and fed straight into a computer for immediate analysis.

TorqSense uses tiny piezo-ceramic combs, known as Surface Acoustic Wave (SAW) devices, fixed to the shaft of the equipment under test. These distort in proportion to the instantaneous torque level in the shaft as it rotates, with the distortion creating RF data signals that are transmitted via a radio frequency coupling. This data signal is then transmitted to the control unit, from which it can be read on an alpha-numeric display or (as Gyrodata does) transferred to a PC for analysis and profile building using a customised version of Sensor Technology's TorqView software programme.

Following trials of TorqSense in its UK plant, Gyrodata bought more and encouraged its American engineering colleagues in Houston to adopt the technology too.

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