Using continuous proportional steering, the AutoTrak system delivered a high-quality borehole in the lower section of the well, as compared to the competitor system which showed sub-optimal steering performance resulting in a tortuous, irregular borehole and problems with the liner installation.

An operator that was using Baker Hughes directional drilling services on its Central North Sea platform decided to re-tender the contract to bring costs in line with its objectives and with the current economic climate. After reviewing proposals from Baker Hughes and a competitor, the contract was awarded to the competitor due to their aggressive pricing strategy.

Under the new contract, the competitor drilled the lower section of an 8⅝-in. wellbore. The top section, which had already been drilled using the Baker Hughes AutoTrak™ rotary steering system (RSS), had been left open for one year due to weather issues and operator commitments.

While drilling the upper section, Baker Hughes collected hole quality data using the ZoneTrak™ G near-bit gamma and the OnTrak™ integrated measurement-while-drilling (MWD) and logging-while-drilling (LWD) services. The competitor’s drilling performance on the lower section of the well was also monitored, as was the liner installation, which was executed by Baker Hughes. This complete set of wellbore data gave Baker Hughes an opportunity to do a direct comparison of the hole quality delivered by the competitor’s RSS versus the AutoTrak system.

Once the data were collated, they were presented to the operator as a technical proposal to improve the hole quality of future wellbores and to increase potential production. The section drilled by the competitor showed very erratic, jerky, pseudo-motor steering, resulting in a tortuous, angular wellbore. The section drilled with AutoTrak and its continuous proportional steering system, showed smooth, consistent performance. The operator was so impressed with the difference in hole quality and

### Results
- Saved 13 days of rig time
- Delivered superior hole quality
- Ensured trouble-free liner installation with zero NPT
- Increased long-term production potential

### Challenges
- Field with interbedded hard stringers
- Difficult liner installation in previous well section drilled by competitor
- Underream and directionally drill 8⅝-in. by 9⅝-in. hole to TD in one run

### Baker Hughes solution
- Deployed an AutoTrak RSS with an optimized Talon PDC drill bit
- Used OnTrak integrated MWD and LWD service and ZoneTrak G near-bit gamma service to collect wellbore data
- Leveraged CoPilot real-time drilling optimization service to monitor and improve performance
production potential it offered Baker Hughes the opportunity to prove the analysis by drilling the next well.

Baker Hughes used a total systems approach to create an optimized drilling bottomhole assembly (BHA) which included an AutoTrak RSS and a Talon high-efficiency polycrystalline diamond compact (PDC) drill bit. A bit tilt analysis was used to calculate the tilt angle and drill bit gauge configuration to ensure the correct gauge.

During drilling, the AutoTrak system maintained a continuous proportional steering vector using three precision-controlled pads mounted on a slow-rotating sleeve. Unlike other RSS—such as the competitor’s system—that use a “push-the-bit” or “point-the-bit” steering principle, the AutoTrak system uses a continuous proportional steering principle to deliver smooth, in-gauge holes, more precise well placement, and faster, more reliable drilling performance. And because AutoTrak systems use internal hydraulics to power the independent steering pads, their steering control is not affected, or artificially restricted, by drilling dynamics like bit pressures, flow rates, and drilling fluid properties. This flexibility allowed the operator to match the Talon bit design to the formation challenges.

The AutoTrak system’s precise steering combined with the Baker Hughes CoPilot real-time drilling optimization service helped to minimize downhole drilling dysfunctions and tool wear. Baker Hughes drilling optimization engineers also provided real-time, proactive insight into drilling trends and to facilitate superior drilling performance.

The well was successfully drilled to a total depth (TD) of approximately 20,000 ft in a single run, with the below rotary table time totaling only 13 days and 1.5 hours in comparison to the planned 26 days in the approval for expenditure. In addition to delivering the well significantly ahead of schedule, the borehole data Baker Hughes collected confirmed the hole quality claims stated in the proposal. And the smooth, in-gauge hole allowed the liner to be installed with no issues or non-productive time (NPT).

The operator was so pleased with the results delivered by the optimized drilling BHA, it re-awarded the contract for its Central North Sea platform to Baker Hughes.