

Lucida advanced rotary steerable service

A new way to drill

Baker Hughes has integrated hardware, software, automation, and remote connectivity to deliver the Lucida™ advanced rotary steerable service—a new way to achieve exceptional drilling performance, exact well placement, and superior wellbore quality.

Achieve exceptional drilling performance

The Lucida advanced rotary steerable service delivers a new way to achieve exceptional drilling performance with a robust integrated bottomhole assembly that features a fully customized drill bit, real-time dynamics sensors, and multi-chip module electronics.

- Each drill bit is designed to maximize penetration rates while still delivering precise directional control—even in the most challenging formations. The application-specific design includes advanced drill bit directional control features, premium cutters, and an optional, engineered interface between bit and BHA to stay on target and drill fast with enhanced durability.
- In the 4¾-in. version of the system, near-bit dynamic sensors convey measurements to surface in real

time, optimizing downhole drilling parameters and enabling faster drilling using the same amount of energy. These sensors measure downhole weight-on-bit, torque, bending moment, and bending direction, while the accelerometers located in the primary electronics measure axial and lateral vibration as well as high-frequency torsional oscillations. The real-time bending moment and direction measurements enhance directional control and can also be used for stringer detection.

- Multi-chip module electronics are integrated into key Lucida system components to expand the operational envelope to tougher, hotter, and deeper drilling environments while also providing greater reliability.

Precisely place the well

The Lucida advanced rotary steerable service delivers new levels of drilling precision, letting you hit geological targets the first time, with no sidetracks. The 4¾-in. system's high-quality, 16-sector gamma-ray sensors are situated very close to the bit to provide real-time formation data that enable quick decisions to geosteer or geo-stop.

Applications

- Wells that require high buildup rates
- Simple or complex 3D wellbore profiles
- Single-run vertical, curve, and lateral
- Extended-reach wells
- Pad or batch drilling
- Onshore, shelf, or deepwater

Benefits

- Integrated drill bit customized for each application to deliver exceptional performance
- Automated wellpath trajectory control system for exact well placement
- Continuous proportional steering for superior hole quality, longer laterals, and faster rate of penetration (ROP)
- Near-bit directional measurements for precise directional control
- Near-bit and azimuthal gamma-ray measurements for precise reservoir navigation
- Multi-chip module (MCM) electronics for increased reliability and operating range
- Real-time dynamics measurements to mitigate drilling dysfunctions for exceptional drilling performance

These include near-bit directional and azimuthal gamma-ray measurements to enable a quick response time, minimizing the need for high doglegs to navigate back to the planned wellpath or sweet spot in the reservoir.

Attain superior wellbore quality

The Lucida advanced rotary steerable service enables superior wellbore quality with a new combination of automated wellpath trajectory control and continuous proportional steering that automatically corrects wellbore trajectory for any formation trends. The integration and automation in these systems reduces wellbore tortuosity, providing a corresponding reduction in torque and drag, to drill better curve sections and longer and faster lateral sections.

- The automated wellpath trajectory control system delivers precise control, even at very high penetration

rates, with near-bit directional sensors that check azimuth and inclination every millisecond.

- The continuous proportional steering system addresses formation and drilling challenges by optimizing the drill bit and hydraulics program with precision-controlled pads that operate independently of bit pressure, flow rates, and drilling fluid properties. This system uses three precision-controlled pads to maintain a continuous proportional steering vector that drills a smooth, in-gauge hole. Steering control is not affected by drilling dynamics because the independent ribs are powered by internal hydraulic power on the decoupled slow-rotating sleeve.

Operate remotely

The Lucida advanced rotary steerable service is fully enabled

for Baker Hughes Remote Operations services. With experience from thousands of wells, our drilling and evaluation experts use proprietary systems and advanced technology to execute remote drilling operations and deliver consistent results—everywhere.

Contact your Baker Hughes representative to learn about a new way to drill with the Lucida advanced rotary steerable service and Baker Hughes Remote Operations Services.

Advanced Lucida Rotary Steerable Service

	4 $\frac{3}{4}$ -in. System	6 $\frac{3}{4}$ -in. System
Wellbore size	5 $\frac{7}{8}$ -in. to 6 $\frac{3}{4}$ -in.	8 $\frac{3}{8}$ -in. to 10 $\frac{5}{8}$ -in.
Automated well bore trajectory control	Yes	Yes
Advanced FE	To be released	Available
Gamma at bit	Optional (4.2 ft from bit connection)	Optional (10 ft from bit connection)
Load sensor	Optional, inbuilt for real-time data	Engineering memory post-run analytics on demand, optimal real-time

