A challenging deepwater well in the Gulf of Mexico required a durable, long-lasting reamer to enlarge the wellbore through several types of hard, abrasive formations. Additionally, a solution was needed to overcome the limitations of mechanical reamers that required a second trip to complete reaming of the rathole section.

Baker Hughes, a GE company (BHGE), recommended the operator use the GaugePro™ Echo on-command digital reamer with StaySharp™ cutter technology, a highly reliable tool that can be placed near the bit to complete ratholes in one run. The GaugePro Echo reamer supplies unlimited activation and deactivation cycles and real-time information including blade status and position, hydraulic oil pressure, temperature and vibration. It also includes a triple failsafe system to ensure it can trip out of hole. It operates independently of pump flow rates and as many as three of these tools can be placed in the bottomhole assembly (BHA) simultaneously.

At 21,290 ft (6,489 m), the cement plug was drilled through to 22,073 ft (6,728 m), and drilling continued to total depth (TD) of 25,760 ft (7,852 m). The BHA was then backed out to 25,584 ft (7,798 m) where the GaugePro Echo reamer, located near the bit in the BHA, was engaged within five minutes. Blade status was confirmed on surface via digital communication from the reamer, and the reamer began enlarging the rathole from 12-¼ in. to 14-½ in.

Using the gamma ray log, the drilling engineer identified limestone stringers and shale sections and recommended the proper rotations per minute (RPM) and weight on bit (WOB) for best reaming performance. During the reaming run, ROP ranged from 50 ft/hr (15.2 m/hr) to 70 ft/hr (21.3 m/hr).

The reamer finished opening the rathole at 25,739 ft (7,845 m), reducing it from 176 ft (53.7 m) to 21 ft (6.4 m), and was pulled out of hole in excellent condition. The subsequent casing run and cement operation was a success with higher than expected formation integrity test (FIT) results.

The GaugePro Echo digital reamer allowed the operator to drill and ream in one run, eliminating a second trip typically needed to ream the rathole. The operator saved 36 hours of rig time, the operating equivalent of $2.1 million USD.