Rathole Elimination System Eliminates Dedicated Cleanout Run, Saves 24 Hours on Deepwater Well

Integrated dual-reamer system drills 314-m section at ROP of 10.7 m/h and enlarges 36 m of rathole in 5.5 hours, French Guiana

**CHALLENGE**
Minimize the time required for hole enlargement while drilling (HEWD) a 340-m section from 14¾ in to 17½ in.

**SOLUTION**
Run the Rhino RHE* dual-reamer rathole elimination system to enlarge the hole section and clean out the rathole in a single run.

**RESULTS**
- Enlarged the 314-m section in 29.3 hours while drilling at average ROP of 10.7 m/h.
- Reduced the rathole length from 40 m to 4 m in 5.5 hours.
- Enlarged the rathole without a dedicated cleanout run.
- Saved 24 hours by avoiding an extra trip to surface.

**Enlarge long section in deepwater well**
While drilling a deepwater well in French Guiana, an operator wanted to extend the section to set the casing because of uncertainty about the depth of a pressure ramp in the formation. To set the casing at the desired depth, the rathole needed to be minimized. The conventional method used to open the 40-m residual rathole to the larger borehole size would have involved tripping the BHA back to surface and performing a dedicated cleanout run, which would have added a day or more to the timeline. With the pressure ramp, the operator wanted to avoid the extra cleanout run and minimize openhole time.

The Rhino RHE system comprises two reamers—one above the MLWD tools that operates in active mode and a passive near-bit reamer that activates on demand to enlarge the rathole.

![Diagram of conventional HEWD BHA and Rhino RHE System BHA](image-url)
CASE STUDY: Rathole elimination system saves 24 hours on French Guiana deepwater well

**Underream and clean out in one run**

Schlumberger recommended the Rhino RHE rathole elimination system because the dual-reamer system could enlarge the hole and reduce the rathole length in one run. The dual-reamer system comprises the Rhino XS* hydraulically expandable reamer positioned above the Schlumberger MLWD tools and a near-bit Rhino XC* on-demand hydraulically actuated reamer positioned below the tools and above the PowerDrive* rotary steerable system and drill bit.

In the first phase of the operation, the section was drilled and HEWD was performed, opening the hole from 4,400 m to 4,714 m. Then the drilling assembly was tripped back to above the rathole, and the near-bit reamer was activated to clean out the rathole. The near-bit Rhino XC reamer provided the flexibility to place the reamer into the drilling assembly and act as a passive stabilizer during the drilling operation. Then the Rhino XC reamer would activate on demand without a pumpdown device and proceed to minimize the rathole length.

**Reduced rathole and eliminated dedicated cleanout run, saving 24 hours**

By simply adjusting the flow rates to index and activate the Rhino XC reamer, the customer was able to enlarge the section and minimize the rathole length in a single run. In only 29.3 drilling hours, the Rhino RHE rathole elimination system drilled the 314-m section at an average ROP of 10.7 m/h and enlarged 34 m of the rathole in 5.5 hours. The system was activated and deactivated as needed to perform the rathole cleanout, eliminating the need for a dedicated rathole cleanout run and saving 24 hours.