Rathole Elimination System Eliminates Three Trips, Saving 72 Hours in Deepwater Well

Rhino RHE dual-reamer system enlarges rathole in exploration well without dedicated cleanout runs offshore French Guiana

**CHALLENGE**
Minimize the time required for hole enlargement while drilling (HEWD) in three sections of a deepwater exploration well.

**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 116 m of rathole in three sections without dedicated runs, saving 24 h on each section by avoiding round trips to surface for a total of 72 h.

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**Enlarge ratholes in deepwater exploration well**
While drilling a deepwater exploration well in French Guiana, an operator needed to reduce the time required for HEWD. The conventional method used to enlarge the ratholes would have involved tripping the BHA back to surface and performing a dedicated cleanout run, which would have added a day or more per section. The operator wanted to avoid the extra cleanout run and minimize operational time.

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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.
**CASE STUDY:** Rhino RHE rathole elimination system saves 3 days on French Guiana exploration well

**Underream and cleanout in one run**
The Rhino RHE rathole elimination system was selected because the dual-reamer system enabled enlarging the hole and reducing the rathole length in one run. The dual-reamer system comprises the Rhino XS* hydraulically actuated 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 rotary steerable system and the drill bit.

In the first phase of the operation, the 484-m section was drilled and underreamed from 4,615 m to 5,099 m; the 261-m section was drilled and underreamed from 4,354 m to 4,615 m; and the 441-m section was drilled and underreamed from 3,913 m to 4,354 m. The drilling assembly was then tripped back above the rathole, and the near-bit reamer was activated to clean out the rathole.

The near-bit reamer has the flexibility to be placed into the drilling assembly and act as a passive stabilizer during the drilling operation. The reamer is then activated on demand without a pumpdown device and proceeds to minimize the rathole length.

**Eliminated dedicated cleanout runs, saving 24 h on each section**
By simply adjusting the flow rates to index and activate the Rhino XC reamer, the customer was able to enlarge the three well sections and minimize rathole length in a single run.

The Rhino RHE rathole elimination system drilled
- the 484-m section and enlarged 45 m of rathole from 12¼ in to 14¼ in at average ROP of 15 m/h
- the 261-m section and enlarged 35 m of rathole from 14¾-in to 17½ in at average ROP of 14 m/h
- the 441-m section and enlarged 36 m of rathole from 16½ in to 20 in at average ROP of 10.3 m/h

In each section, 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 h per section and a total of 3 days for the well.