Petroamazonas Saves 1.5 Days in Three Wells with Central Stinger Element, Ecuador

PDC bit with conical diamond element increases ROP up to 33%, enhances borehole quality

**CHALLENGE**
Improve drillbit lateral stability, allowing more efficient formation evaluation runs with wireline.

**SOLUTION**
Use IDEAS* integrated design platform to configure a laterally stable drill bit with a centrally placed Stinger* conical diamond element.

**RESULTS**
- Increased ROP on three wells by 27% to 33%, saving 1.5 days.
- Improved hole quality, minimizing problems during wireline log runs and reducing risk of stuck pipe.
- Delivered uniform borehole, resulting in higher chances of a successful cementing operation.

**Improve borehole quality and wireline running speeds**

While drilling a multiwell campaign in Eden Yuturi field, East basin, Ecuador, Petroamazonas sought to improve borehole quality to enable more efficient wireline formation evaluation runs. Drilled from multiple well pads, the directional profiles include J- and S-style wells that reach TD with an 8½-in production section that is 1,000–1,500 ft in length. The wells were drilled initially in the Tena formation, which was composed by claystone interval, and then into the Napo formation, a heterogeneous sequence with an unconfined compressive strength (UCS) ranging from 5,000–15,000 psi and high UCS spike, and where shale, limestone, and sandstone were encountered. To maintain borehole quality in the shale sections, flow rates and hydraulic horsepower (HSI) was controlled.

In offset wells, the operator achieved an ROP of 60–65 ft/h, and the bits reached TD in good condition. The varying formations in the 8½-in section tend to breakaway and ledge, causing challenges with the formation evaluation wireline runs through the production section. After drilling, time-consuming wiper trips conditioned the borehole to improve wireline running speeds.

---

The drill bit with a centrally placed Stinger element increased ROP by 27% to 33% on three wells, saving the operator 1.5 days.
CASE STUDY: Central conical diamond element saves 1.5 days in three wells, Ecuador

Maintain lateral stability while maximizing ROP and durability
To improve lateral stability of the base drillbit design, Smith Bits suggested a modified drillbit that employed a central Stinger conical diamond element. The Stinger element has a thick polycrystalline diamond composition designed for maximum strength and durability. The centrally located element removes the inefficient PDC cutters from the bit face, replacing them with technology that enables high-point loading to fracture rock more efficiently, increasing durability and ROP while maintaining lateral stability. Using the IDEAS integrated design platform, the MSiZ616 drill bit was developed from the base design used on offset wells. Surface parameters were moderated, keeping flow rate and HSI controlled while reducing rpm, minimizing borehole spiraling and avoiding washouts. In addition, the enhanced stability and obtained planned trajectories leads to good directional response.

Increased ROP by 27% to 33% on three wells, saving 1.5 days
Adding the central Stinger element on the drillbit design enabled the wireline assembly to reach TD without hanging up. The drill bit also produced a more uniform borehole shape, providing conditions conducive to efficient wireline operations. As a result, the operator saw an increase of 27% to 33% on three wells when compared with offset wells, saving 1.5 days.