Expro Excellence

# AERO™ Concentric Reamer – Enhanced BHA retrieval and casing running through severe losses in harsh carbonate formation

## Coretrax | Advance

### Objectives and background

- Expro supported an Indonesian operator in drilling a well predominantly composed of carbonates, a formation type typically prone to severe loss circulation issues. Lost circulation situations require additional drilling fluid and Lost Circulation Materials (LCM), significantly increasing drilling costs
- Furthermore, drilling through severe losses poses considerable risks to wellbore quality and stability, including the potential for under-gauged holes, hole collapse, and stuck BHA or pipe. These challenges can result in non-productive time (NPT) and substantially escalate overall drilling costs
- Anticipating these risks, the customer sought a solution to minimize their exposure, particularly in the 12-1/4" section where the well inclination reaches 63°

### Expro Excellence

- In severe losses situations, effective hole cleaning becomes challenging without full returns, leading to the accumulation of cuttings and an increased risk of differential sticking, potentially resulting in stuck pipe incidents
- Expro's AERO Concentric Reamer is a one-piece construction tool with under-gauged blades and adequate flow area which combats differential sticking
- The AERO Reamer conditions the borehole behind the bit and BHA, ensuring that any irregularities in the borehole related to doglegs, whirling and spiraling are minimized. A smoother borehole enables quicker retrieval of BHA, and faster casing running speeds

**Challenges:**

- A 1,633 ft section transitioning from 45° to 63° inclination, predominantly in limestone
- High risk of total losses, tight spots, overpulls during BHA retrieval, and restrictions when running the casing string to the bottom, as experienced in a previous section

**Potential Consequences Without Expro's Solution:**

- Increased risk of stuck pipe and tight spots
- Difficulties in BHA retrieval and casing running
- Higher non-productive time (NPT) and associated costs to complete the section

### Value to the client

- The 12-1/4" section (with AERO Reamer) was drilled from 2,635 ft to 4,268 ft MD, predominantly through carbonates with multiple hard stringers. Total losses were encountered at 3,589 ft MD, and blind drilling continued to TD
- Upon reaching TD, BHA retrieval was smooth, with no overpull required, and casing was run to the bottom without additional downweight, as no restrictions were encountered
- In contrast, up to 20klbs overpull were recorded during the POOH of the 17-1/2" BHA (without AERO Reamer), and up to 10 klbs of downweight was required during the RIH of casing down to Section TD, due to tight spots
- The AERO Reamer effectively conditioned the borehole in the 12-1/4" section, mitigating risks associated with irregular borehole geometry and severe loss zones

Cost saving

Reduction of rig time

| Variables | 17.5" Section (no AERO) | 12.25" Section (with AERO) |
|---|---|---|
| Previous casing depth (ft) | 808 | 2672 |
| Section TD (ft) | 2672 | 4268 |
| Drilled interval (ft) | 1864 | 1596 |
| Time to POOH BHA to surface (hrs) | 6 | 8.25 |
| BHA POOH rate (ft/hr) | 445.33 | 517.33 |
| Overpull (klbs) | 15-20 | No overpull |
| Time to RIH casing to bottom (hrs) | 10.5 | 11.5 |
| Calculated casing RIH rate (ft/hr) | 254.48 | 371.13 |
| DDR casing RIH rate (jts/hr) | 10-Aug | 12-Oct |
| Down weight (klbs) | 10 | No downweight |