

Drilling with Casing System with Defyer® Drillable Casing Bit Successfully Drills Through Total Losses Zones, Saves 17.6 Days



18-5/8" x 22" DPA8619X



13-3/8" x 16" DPA10616X

Weatherford Defyer DPA Series drillable casing bits were used to drill through the total losses zones.

Objectives

- In a single run, safely drill, set, and cement the 13 3/8-in. and 18 5/8-in. casing to the planned target depth (TD) in two sections of a gas appraisal well.
- Eliminate hole caving problems and the need to re-run casing in total losses zones.

Our Approach

- Weatherford recommended the use of drilling with casing (DwC) technology to drill and case the indicated sections while mitigating the hazards of total losses zones.
- As the surface casing drive system, the Internal Casing Drive Tool was deployed for the 18 5/8-in. section and the Modified DwC Spear was deployed for the 13 3/8-in. section, to improve operational safety and efficiency.
- The Defyer DPA Series drillable casing bit was used to drill each section to TD while achieving a rate-of-penetration (ROP) more than 3 times greater than the ROP achieved using a conventional bit in similar wells in the area.
- Total losses were experienced throughout both sections because of a suspected fault near the 18 5/8-in. shoe.

LOCATION

Papua New Guinea

WELL TYPE

Gas, appraisal well

FORMATION

- 18 5/8-in. section: claystone and siltstone
- 13 3/8-in. section: shale and siltstone

HOLE SIZE AND ANGLE

- 18 5/8-in. section: 22-in., 1.7°
- 13 3/8-in. section: 16-in., 3.7°

CASING TYPE AND SIZE

- 18 5/8-in. section: 18 5/8-in., 87.5ppf, K55, BTC with torque rings
- 13 3/8-in. section: 13 3/8-in., 68ppf, P110, buttress with torque rings

DEPTH

- 18 5/8-in. section
 - In: 15 m
 - Out: 443 m
 - Interval: 428 m
- 13 3/8-in. section
 - In: 462 m
 - Out: 864 m
 - Interval: 402 m

PRODUCTS/SERVICES

- Drilling with casing services
- 18 5/8-in. x 22-in. OD Defyer DPA8619X
- 13 3/8-in. x 16-in. OD Defyer DPA10616X
- Internal Casing Drive Tool
- Modified DwC Spear



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- The plastering effect of DwC (which smears the cuttings on the formation) is critical in situations such as these when losses can prevent the cleaning of cuttings from the well.
- The cementing operation was performed immediately upon reaching TD in the 18 5/8-in. section by means of the Internal Casing Drive Tool, which allowed the operator to reciprocate the string while cementing.
- This was the first time that DwC was executed with an external casing packer, resulting in a successful cement top job in total losses conditions.

Value to Client

- Use of Weatherford DwC enabled successful drilling and cementing of the 13 3/8-in. and 18 5/8-in. casing strings at TD in single trips through total losses zones and saved 17.6 days of operational time when compared to a neighboring well with similar characteristics that was drilled conventionally.
- The fully drillable Defyer casing bit enabled the client to drill subsequent sections without an additional trip and achieved an ROP more than 3 times greater than the ROP achieved with conventional bits in neighboring wells.
- The non-retrievable DwC system mitigated surface drilling problems, reduced nonproductive time (NPT), and reduced manual handling to improve safety.

