



Weatherford®

REAL RESULTS

DwC™ Technology, Defyer™ Bits, OverDrive™ System with TorkDrive™ Tool Set Casing at Planned Depth in One Trip

Objectives

- Set casing at planned depth and avoid the additional drilling costs associated with tripping across the unstable Fiqa Shargi shales. In previous wells in the Khazzan field, BP Oman encountered problems reaching total depth (TD) while running 13 3/8-in. casing conventionally in a 17 1/2-in. hole section.
- Provide an effective solution for casing to reach TD and minimize delays before cementing.

Results

- Weatherford's Total Depth™ services group evaluated formation strength, drillability, bit hydraulics, and torque and drag before the installation. The recommended solution consisted of the *OverDrive* system with the *TorkDrive* compact casing running and drilling tool to deploy a 13 3/8- × 16-in. casing *Defyer* DPA8416 drillable casing bit, and specially designed *SpiraGlider*® centralizers in a string of 13 3/8-in. L80, 72-lb/ft DINO VAM to the planned casing setting depth.
- A 20-in. casing string was set in the upper section to isolate severe loss circulation in the shallower hole. BP Oman continued drilling using the 13 3/8-in. casing string equipped with the *Defyer* DPA8416 drillable casing bit to the target depth.
- BP Oman used an average rate of penetration (ROP) of 20 ft/hr (6.4 m/hr) with a maximum on-bottom torque of 10,000 ft-lb (13,558 N·m), while controlling wellbore instability commonly caused by brittle shale cuttings.
- The *DwC* technology provided an accurate casing setting depth across the next formation at 3,618 ft (1,103 m) while maintaining wellbore stability, minimizing the number of trips across the section, and reducing the size and rate of the cuttings generated.



Weatherford's 13 3/8- × 16-in. *Defyer* DPA8416 drillable casing bit and the *TorkDrive* compact casing running and drilling tool enabled BP Oman to set the casing at planned depth.

Operator
BP Oman

Field
Khazzan

Well Name
KZN 11

Location
Oman

Formation
Fiqa Shargi

Well Type
Onshore appraisal, oil producer

Hole Size
16 in.

Depth

- In: 2,368 ft (722 m)
- Setting: 3,618 ft (1,103 m)
- Run length: 1,250 ft (381 m)

Average ROP
20 ft/hr (6.4 m/hr)

Casing
13 3/8-in. L80, 72-lb/ft DINO VAM

Products/Services

- Total depth technology
- *DwC* technology
- *OverDrive* system
- *TorkDrive* compact casing running and drilling tool
- 13 3/8-in. × 16-in. *Defyer* DPA8416 drillable casing bit
- 13 3/8-in. × 15 3/4-in. *SpiraGlider* HD centralizers



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Results (Continued)

- The casing string was cemented immediately using a six-bladed conventional PDC bit. The Defyer™ DPA8416 drillable casing bit was drilled out to the next 12 1/4-in. section in the same trip. The Defyer drillable casing bit was drilled out in less than 8 minutes.
- Weatherford's total depth technologies were deployed, and the TorkDrive™ compact tool was used to run 2,368 ft (722 m) of casing and to drill 1,250 ft (381 m) with the Defyer DPA8416 bit. More than 87 connections were made during 57 hours of running and drilling operations with no lost time or safety incidents. Average casing-running speed was 8 joints per hour.
- BP Oman achieved a total depth of 3,618 ft (1,103 m) without nonproductive time (NPT) incidents.

Value to Client

- Using Weatherford's DwC™ technology with Defyer drillable casing bits and the TorkDrive tool enabled BP Oman to set the casing at the planned depth by avoiding drilling hazards such as wellbore instability in the drilled formation.
- Weatherford's total depth technologies helped BP Oman obtain results in one trip without the NPT incidents historically associated with this formation type, saving the costs associated with additional drilling and casing running trips.
- BP Oman saved two in and out drillpipe trips, and using the OverDrive™ system removed personnel from hazardous areas during casing-running operations, enhancing overall safety.
- The TorkDrive compact tool enabled BP Oman to reciprocate and rotate the casing string while simultaneously circulating through tight spots and trouble zones without needing a check trip, saving significant time and costs.



Weatherford's Defyer drillable casing bit created smaller cuttings, enabling BP Oman to circulate debris up and out of the wellbore more effectively and reducing the risk of additional production casing damage.