

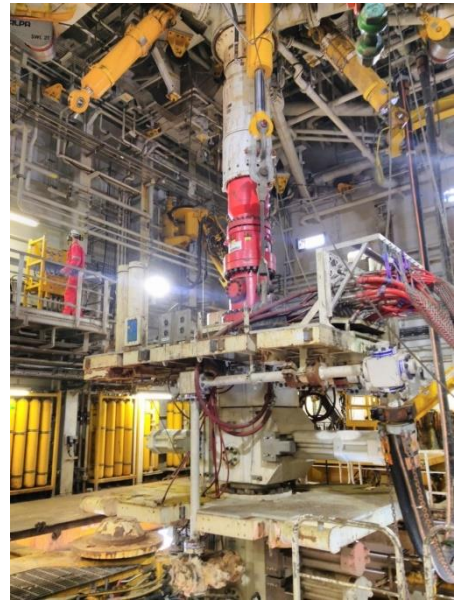
# Real-Time Operating Center Engineers in Canada Enable Operator in Norway to Drill 5 7/8-in. Section in Offshore Development Well

## Objectives

- Drill production hole section to a total depth of 15,787 ft (4,812 m) measured depth (MD) using statically underbalanced mud, while maintaining constant bottomhole pressure.
- Perform a cement squeeze prior to drilling the reservoir section with managed pressure drilling (MPD) after losses were encountered during the formation integrity test (FIT) after drilling out the casing shoe. Additional losses occurred after reaching total depth (TD), necessitating the use of lower mud weight before proceeding with well completion through MPD.
- Provide real-time engineering support to evaluate operational performance and adapt conditions as needed to reach planned final depth.

## Our Approach

- A high level of MPD engineering capabilities was offered to the operator during the execution phase, meeting all expectations in terms of calibrating Weatherford hydraulic models.
- Weatherford combined local experience with the deep knowledge acquired during previous campaigns across critical applications in North America to provide the operator with a comprehensive approach to deal with common issues when drilling the reservoir section.
- Field personnel performed multiple dynamic formation integrity and multiple dynamic pore pressure tests at different depths in the reservoir section to ascertain the required tripping mud weight, evaluate the gas in the reservoir, confirm drilling limits, and avoid losses while circulating, drilling, and tripping.
- The experts facilitated rapid adaptation to changing well conditions and bottomhole pressures, particularly when losses occurred at equivalent circulating density (ECD) and equivalent static density (ESD) values lower than the recorded FIT.
- This agile ability enabled multiple displacements between drilling mud and kill mud, as well as precise pill placements at various depths within the well.
- A surface backpressure (SBP) swab margin was applied while stripping back to the previous casing shoe before removing the bearing assembly.
- The well completion was successfully deployed while maintaining strong control over bottomhole conditions with high operational flexibility.



The RCD Model 7875 setup on the rig.

**LOCATION**  
Norway

**WELL TYPE**  
Development

**FORMATION**  
Terbert

**HOLE SIZE AND ANGLE**  
5-7/8 in., vertical

**TEMPERATURE**  
275°F (135°C)

**PRESSURE**  
1.6 to 1.85 SG

**DEPTH**  
12,916 to 15,787 ft (3,937 to 4,812 m)

**OTHER**  
Narrow drilling margin

### PRODUCTS/SERVICES

- Rotating control device (RCD) Model 7875
- Victus™ intelligent MPD software
- MPD RTOC engineering service
- Secure pressure management system (PRV1)



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## Our Approach (continued)

- The engineering capabilities were applied daily while drilling the reservoir section with presence on the field and remote support to cover a 24/7 span, reducing reaction time during operations to unnoticeable.
- Most updated procedures to apply well balancing, tripping, and completion with MPD were put in place by the 24/7 engineering support team.

## Value to Customer

- MPD remote engineering support was provided on the last 5 7/8-in. reservoir section of the well.
- Despite the challenges encountered, 100% of the well was drilled to planned depth, and Weatherford MPD engineering contribution was critical to achieve perfect results without incurring nonproductive time (NPT).
- The high level of expertise of the Weatherford MPD engineering support for drilling, tripping, well balancing, and managed pressure completion proved the differentiator for the operator, reaching all planned objectives.



Rollover/pill placement inside the casing.

