

VariForm® Centralizer Prevents NPT During 40-Hour Liner-Running and Cementing Operation in Depleted Formation

Objectives

- Run a liner to total depth (TD) through a depleted formation while mitigating mud losses and differential sticking.
- Rotate the liner in the open hole to remove mud and to improve zonal isolation in the cemented section for planned perforation and completion operations.

Our Approach

- Weatherford CentraPro Plus® centralizer-placement software modeling identified the VariForm centralizer as the optimal technology to centralize the liner in the 8 1/2-in. open hole and to facilitate liner rotation—before and after setting the hanger—by reducing downhole torsional forces.
- Weatherford selected its low-equivalent-circulating-density (ECD) polished bore receptacle (PBR), liner-top packer, and hydraulic rotating liner hanger to rotate the liner after setting the hanger.
- Based on the results of comparative operational simulations using the CentraPro Plus software, the team placed two 7- x 8 1/2-in., six-bow VariForm centralizers on each liner joint across the planned cemented section. This helped to reduce differential sticking while running the liner downhole; to enable liner rotation; to improve mud removal, cement placement, and zonal isolation; and to achieve 93% standoff without imparting starting and running forces.
- The team ran the liner to TD without mud losses or other problems. Then the team established circulation and rotated the liner at 20 rotations per minute (rpm). The liner set inside the 9 5/8-in. casing and the running tool released with no issues.
- Prior to cementing, liner rotation restarted at 20 rpm while the team conditioned the hole. The cementing job proceeded as planned.
- Afterward, the team set and pressured tested the liner-top packer.

Value to Client

- For the duration of the 40-hour operation, the VariForm centralizer helped to prevent nonproductive time (NPT) related to reaching TD and rotating the liner before and after setting the hanger.
- Despite the poor hole conditions, the operation had no lost circulation or differential sticking, which helped to save rig time and associated costs.



The one-piece VariForm centralizer slips easily onto liner or casing to provide a single, metallurgically invisible weld with no hinges or mechanical connections. The bows collapse during run-in and then, upon landing, restore to the full outside diameter to provide reliable standoff.

LOCATION

Norway

WELL TYPE

Offshore, injector, oil

FORMATION

Siltstone, sandstone, shale

HOLE SIZE AND ANGLE

8-1/2 in., 42° at the toe and shoe

LINER SIZE AND TYPE

29 lb/ft L80 VAM Top* HC

DEPTH

10,302 ft (3,140 m)

PRODUCTS/SERVICES

- CentraPro Plus centralizer-placement software
- 7- x 8 1/2-in., six-bow VariForm centralizer
- 7-in. single beveled stop collar
- 7-in. float shoe
- 7-in. float collar
- 7-in. Sub-Surface Release™ plug set
- Hydraulic rotating liner hanger
- Low-ECD PBR
- Liner-top packer



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