

Egypt

Surge reduction float equipment improves casing RIH speed and saves ~294 hours

SuperFill™ II Big Bore equipment eliminates lost circulation

CHALLENGE

- Tight annular clearance between casing strings
- Narrow operational window
- Long time to fill casing
- Reduced pipe speed while RIH

SOLUTION

- SuperFill™ surge reduction float equipment

RESULT

- Casing strings run to section TD with no fluid loss
- Clear indication of auto-fill deactivation
- Average casing run speed increased by 71%
- Saved ~294 hours

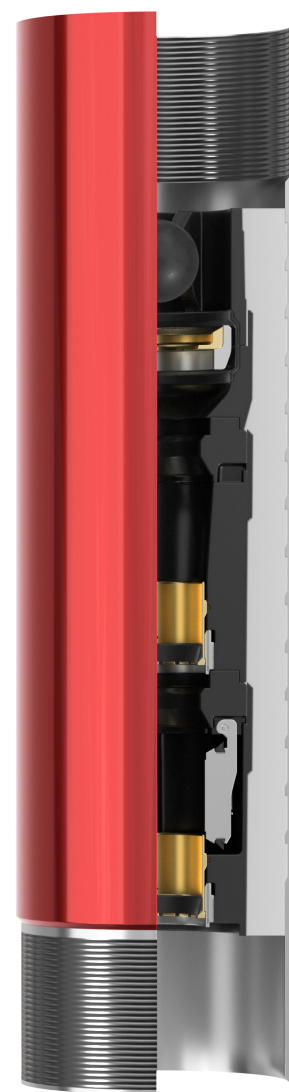
Overview

As part of a drilling campaign in the Mediterranean Sea, a complex well with a lean profile introduced tight annular clearances between casing strings. Because the well was drilled across pressure sensitive formations with a reduced operational window, it was critical to control surge pressure while running in hole (RIH) to minimize induced lost circulation and help ensure successful cement operations.

The conventional solution, which involves reduced pipe speed, can be inefficient in terms of preserving the formation from surge pressure effects and can have a significant impact on the well construction timeline. Thus, a true auto-fill reliable float system was necessary.

Challenge

Because of the well complexity and the lean construction design, multiple tight annular clearances originated between the 16-in. drilling liner set at 2,346 m measured depth (MD), 14-in. intermediate casing set at 3,258 m MD, 9 5/8-in. liner set at 3,908 m MD, and 7 5/8-in. production liner set at 4,924 m MD. The tight annular clearances, down to 0.543 in. radially, were expected to induce high surge pressure while RIH to total depth (TD) in each respective section.



The SuperFill™ II Big Bore FVB+ valve configuration allows circulation without deactivation of the auto-fill capability.

This condition would significantly impact well construction costs with drilling fluid loss, and could negatively impact the effectiveness of cement operations and stretch well construction flat time if pipe speed were used as a surge-pressure-control solution.

Solution

Halliburton designed the cement operations using SuperFill™ float equipment on the 16, 14, 9 5/8, and 7 5/8-in. casing strings to help minimize surge pressure and optimize pipe run speeds. Large-sized float collars were constructed with the SuperFill™ II Big Bore design. This valve assembly features a double coil mousetrap spring design that provides more contact between the spring and flapper. This increased contact improves flapper closing and backpressure holding reliability at the end of the cement operations. A redundant sleeve mechanism provides enhanced tool reliability. A large 8.95 in.² auto-fill flow area helps minimize the localized pressure drop caused when displaced fluid is forced into the string, which reduces surge pressure applied to the open hole.

The selected type FVB+ valve allows circulation without auto-fill deactivation, which enables washing past ledges or restrictions while running casing to TD and maintains auto-fill capabilities afterward. The retained deactivation ball does not have to pass through the landing string and is sized to maximize flow area through the valves. This enables increased compatibility with casing and liner hanger tools and SSR® plug systems.

Result

Deployment of the SuperFill™ surge reduction equipment allowed the operator to enhance mud displacement and pipe speed while protecting the formation. This resulted in no loss of circulation while RIH with casings and liner, which allowed cement operations to be performed in optimum conditions.

Clear pressure indications of auto-fill feature deactivation were observed and allowed holding backpressure at the end of the cement operations.

The SuperFill equipment enabled this major operator to successfully run, cement, and install liner and casing strings and reduced RIH time by approximately 294 hours.

**SuperFill™ equipment
helped this major operator
to reduce RIH time by
approximately 294 hours.**

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