



Deployment of a ‘settable pill’ based on a cross-linked polymer solves downhole losses for Algerian operator

The engineered solution developed by Newpark laboratory engineers also saved the operator lost time and cost overruns.

CHALLENGE	SOLUTION	RESULT
<ul style="list-style-type: none"> • Reduce mud and cement losses • Don't damage reservoir • Eliminate NPT and excessive costs 	<ul style="list-style-type: none"> • Custom-developed X-linked settable pill composed of a polymer slurry 	<ul style="list-style-type: none"> • Circulation regained without any losses • Days of rig time saved and NPT eliminated

OVERVIEW

While drilling through a reservoir formation in Algeria, the operator noticed a severe-to-total downhole lost circulation situation. A total of sixteen conventional LCM pills for a total volume of 72 m³ were pumped without success. This led to an unusually high amount of non-productive time (NPT).

Based on the excellent results achieved by Newpark's solution validated by client feedback on previous successful deployment; it was recommended that a settable X-Link pill is the solution of choice for this section.

CHALLENGE

One of the most severe problems during drilling operations in terms of lost time and cost overruns is the loss of circulation. The challenges for Newpark in this particular situation were:

- Reduce mud and cement losses during the drilling phase while avoiding any damage to the reservoir.
- Ensure top of cement reach required height for a good zonal isolation and well integrity.

A second well was also successfully treated and cured with a single x-link treatment pill (10 m³) while drilling through the formation with viscous water in order to consolidate the integrity of MPD open hole reservoir section due to the losses encountered. As a result, Newpark was able to reduce the losses to zero, while allowing drilling ahead to the TD section with full drilling parameters.

SOLUTION

Placement of a cement plug is often an alternative when the traditional LCM treatments are ineffective. Unfortunately, the cement gets too viscous to flow into the fractures, causing them to not seal properly in the loss zone. There are also more complex solutions for massive fluid losses such as settable pills, which form a viscous and rubbery solid mass downhole, and cross-linked polymer gels.



Newpark Fluids Systems' technical team recommended using of a settable X-linked polymer slurry to be spotted over the loss zone in order to seal the highly sensitive formation.

A first pill (04 m³) was successfully designed and spotted, as per the Newpark teams placement plan, at 1419m by applying a dynamic squeeze-by-hesitation procedure at different flow rate with no losses recorded. The losses appear only when drilling through the new formation.

The state operator decided to continue drilling with losses using the conventional LCM pills to cure the losses until it could be controlled. A total of five settable X-link pills were pumped and spotted successfully at different depths. The operator decided to use the settable pill suggested by the Newpark technical team as a default when any loss event occurred, in order to consolidate the integrity of the new formation drilled.

RESULTS

The settable pill, based on an X-link polymer and engineered in Newpark's Laboratory, was the key strategy to drill ahead and complete the section in a naturally fractured formation.

Mixing, pumping and placing procedures were studied and planned by Newpark Technical Engineers and met the operator's requirements.

The solution was so impressive and successful that it is now part of the strategy to cure losses in other fields where conventional LCM might fail.

In the end, the settable X-link pill became thick, and the below goals were met:

- Circulation was regained without any losses.
- Tag and drill-out settable pill through the thief drilled zone without any losses.
- Saved the operator days of rig time and avoided the placement of possibly damaging lost circulation cement plugs.

Studies performed in the Newpark Fluids Systems laboratories have increased our engineer's knowledge on loss characterization and led to a "fit for purpose" strategy to cure losses, prevent NPT, and reduce overall drilling costs.