CASE STUDY | S2 | OFFSHORE

CENTEK
excellence to the core

OFFSHORE, MALAYSIA

S2 CENTRALIZERS SUPPORT PACKERLESS CEMENTED MONOBORE COMPLETION IN TWO HIGHLY DEVIATED WELLS

Region: Asia Pacific | **Country:** Malaysia | **Location:** Sabah Field

A field in offshore Sabah presented a complex completion challenge to deliver a packerless cemented monobore in deep, highly deviated sidetrack wells where cement would act as the primary barrier for zonal isolation and long-term well integrity.

The operator's objective was to run 3-1/2" tubing through existing milled windows and into 8-1/2" open hole, reach total depth safely, and achieve the standoff required for effective cement placement.

This was particularly important because the completion design removed reliance on a mechanical packer, placing greater responsibility on the cement sheath to provide the required barrier envelope.

Previous cemented monobore experience had highlighted the risk of tubing fill, restricted access for perforating tools, and the need for accurate cement placement. The wider well program also involved complex pressure conditions, including depleted and virgin pressure zones, high overbalance and narrow-margin cementing considerations.

THE CHALLENGE

The wells were part of a technically demanding sidetrack program in offshore Sabah, where the 3-1/2" tubing had to pass through milled windows before being run into the 8-1/2" open-hole section.

This created a key mechanical constraint. The centralizer program had to provide the required tubing standoff without increasing the risk of the string becoming held up or stuck while passing through the milled window.

In the most challenging well of the program, the technical stakes were significantly elevated.

- The well reached a measured depth of 12,654ft against a true vertical depth of 7,094ft, with a **high ratio of horizontal-to-vertical displacement,** creating a **high-drag environment**, where the risk of the string being unable to reach total depth was a primary concern for the operator.
- **The high deviation added further complexity**. At up to 76° inclination, the 3-1/2" tubing would naturally tend to lie on the low side of the 8-1/2" borehole. Without sufficient restoring force from the centralizer program, this continuous wall contact could increase the risk of key-seating, excessive drag and poor annular displacement during cementing.
- **Buckling was also a concern**. In a long, deviated section, the compressive forces needed to push the lightweight 3-1/2" tubing to TD can increase the risk of helical buckling if friction is not carefully managed.

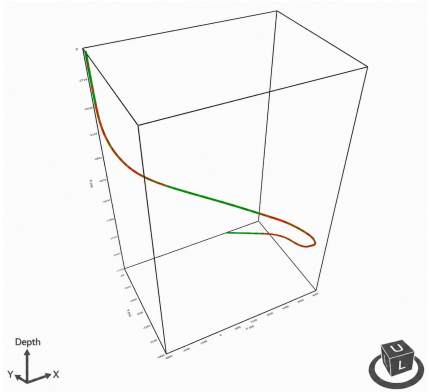
The centralizer program therefore had to be optimized not only to support standoff, but also to reduce drag and maintain low running forces.

THE SOLUTION

Centek's 0312-0812S centralizer was selected for the 3-1/2" tubing, together with the 031200SO stop collar.

- **Drag Reduction:** Using centralizers with a low coefficient of friction was vital to ensure the hook load remained positive. The design ensured that the tubing "glided" through the 5,500ft+ of deviated section.
- **Guaranteed Standoff:** Despite the heavy side-loads generated at 76°, the centralizers provided sufficient restoring force to lift the tubing off the borehole wall, ensuring the 3-1/2" string remained concentric within the 8-1/2" open hole for the subsequent cement job.
- **In-House Simulation:** We utilized our proprietary simulation software to model the 12,654ft wellpath. We enable to pinpoint exactly where side-loads would be highest, allowing us to optimize centralizer spacing (running a combination of 1 or 2 per joint) to keep drag within rig limits.

This simulation-led approach gave the operator a more informed basis for balancing restoring force, drag and the ability to safely reach TD.



THE RESULT

The 0312-0812S centralizers supported successful running and cement placement in the cemented monobore application.

No centralizer-related running issues were encountered, apart from one well where the string had to be pulled out of hole, due to issues unrelated to the centralizers and new centralizers were required before rerunning.

> "Fortunately, the new centralizers arrived in time for the last well application. This was made possible by Centek's excellent support—despite the last-minute request, Centek delivered with impressive speed in both fabrication and logistics."
>
> Cementing Company

Cement Bond Log (CBL) results confirmed the cementing bond objective had been largely delivered. The operation achieved a clean, gas-tight monobore with no tubing fill and smooth perforation across the zones.

> "From a cementing perspective, our primary objective is to achieve adequate standoff, which has already been successfully met using the S2 centralizers. However, [the operator's] requirement goes beyond cementing performance. They rely on Centek's simulation to ensure that the tubing can be safely RIH to TD, particularly because our internal simulation has limitations in accurately predicting hook load."
>
> Cementing Company

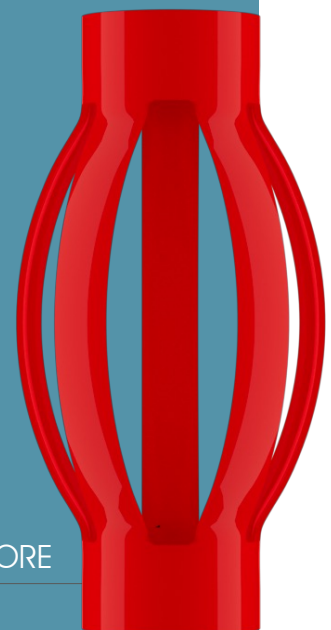
KEY TAKEAWAYS

For Centek, this case study demonstrates the value of combining 0312-0812S centralizer performance with simulation-led placement.

- **Predictive Accuracy:** The actual hook loads recorded during the 12,654ft run mirrored the pre-job simulation data with high precision. This validated the friction factors used in our model and proved that the centralizers performed exactly as engineered.
- **Optimal Cement Placement:** Because the tubing was perfectly positioned according to the simulation's "optimal placement" map, the cement slurry was able to displace the drilling fluid effectively across the entire 360° annulus.
- **Zonal Isolation:** Post-job logs confirmed a high-quality, hydraulic seal with no evidence of channeling or gas migration.

The wider operation demonstrated the viability of a packerless cemented monobore completion in a high-risk pressure environment and marked a milestone as the first packerless and longest cemented monobore completion for the operator.

The successful cemented monobore completion has now set a technical standard for future high-angle MTGL completions in offshore fields in Sabah, Malaysia.



EXCELLENCE TO THE CORE