

Aker BP's Digital Muscle Cutting Mechanical Complexity Saved Millions

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In an industry that can gravitate toward bespoke solutions, **Aker BP** sought something different: a simplified setup.

The operations team believed simplifying vendors' subsea control equipment for **completions** would reduce costs, improve efficiency, and increase safety. Over a period of 6 years, the operator worked with Optime Subsea and **Halliburton**, which later bought Optime, to develop digital hydraulic controls and an associated orientation system that could install a tubing hanger in Christmas trees without umbilicals and other conventional equipment.



The approach was initially rolled out for horizontal subsea trees in 2021, and in September 2025, a vertical tree approach was deployed in Aker BP wells on the Norwegian Continental Shelf

(NCS). The results of the deployment

for vertical trees were an average savings of between \$4 million and \$5 million per well, with minimal nonproductive time (NPT), **Mads Rødsjø**, Aker BP's vice president for drilling and wells, told *JPT*.

"Most fields have their own quirks and perks, if you like, and they're all tailor-made to that

particular system," he said. In those different fields, each vendor has its own custom control systems for installations, entries, and so forth.

"We set ourselves out to simplify this because there's a huge hidden cost on the rig side with rig modifications, installation of heavy equipment," he said, noting equipment can be costly, and modifying the rig requires both time and money while also decreasing productivity of the rig.

The goal was equipment that didn't require rig modifications.

"We decided to go the route where we would replace a lot of heavy equipment with basically software and technology," Rødsjø said.

That software and technology includes Enhanced Remote Operated Control System (eROCS) and Optime Tubing Hanger Orientation System (OTHOS), which Optime and Halliburton developed in collaboration with Aker BP. The eROCS technology is the next evolution of the Remote Operated Control System (ROCS), which first deployed on the NCS in 2021.

The combined eROCS and OTHOS digital hydraulic control and orientation systems can be used to install and orient a tubing hanger for a vertical Christmas tree without requiring umbilicals, conventional tubing-hanger

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The eROCS system was first deployed for Aker BP on the Norwegian Continental Shelf in September 2025. Source: Aker BP.

orientation tools, or standard blowout-preventer (BOP)-alignment equipment.

Addition by Subtraction

Benefits of using eROCS and OTHOS include reducing red-zone exposure as well as eliminating the need to lift and handle tubing strings, which are “notoriously big,” Rødsjø said.

“We took off 30 tons of equipment, we spent a fraction of the time, and basically, we don’t put people in harm’s way. And this is just by developing these digital and technology solutions. We basically knocked off a lot of money.”

Aker BP expects similar savings across each of the additional 51 wells on the NCS where it plans to use this technology. As of mid-January, the company said it had used the technology on six wells with a track record of minimal NPT.

The initial deployment of eROCS and OTHOS essentially proved the technologies, Rødsjø noted, and Aker BP is already seeing “huge benefits” from using them, along with plenty of potential.

“Think about the deep waters. That’s where it really would make a big difference because there, you’re kind of running your completion twice, the landing’s longer than the actual completion. So, the savings in that environment would be just tremendous,” he said.

Developing eROCS

Rødsjø attributes the successful development of the system to transparency and open communications with Halliburton and Optime.

“It’s been a success from day one. And I think the biggest reason for that is not necessarily in our

technology procedures, but the extremely close and trustful cooperation we have with our partners and vendors,” he said.



Rodger Hooker, managing director of Optime, a Halliburton service, told *JPT* that having a partner like Aker BP be involved in developing eROCS and OTHOS was key.

“Without Aker BP and their interest in changing how the status quo operations are executed, then I think we would really struggle to introduce this new technology into the market,” he said. After an operator like Aker BP opens that door, he added, fast adopters often follow, leading to a snowball effect for take-up of the technology.

While Aker BP initiated Optime’s work on the technology that became ROCS in 2019, it wasn’t long before Halliburton and Optime formed a global strategic alliance to apply Optime’s ROCS technology to Halliburton’s services, and in January 2025, Halliburton acquired Optime.



Over the years, Halliburton and Optime incorporated operational insights into ROCS, with eROCS representing the culmination of learnings along the journey, **Erlend Helgerud**, technology senior manager of Optime, told *JPT*.

The eROCS features the newly developed V-3 valve, which made it possible to reduce the system’s size. “It’s very much smaller, it’s a lot



The eROCS and OTHOS equipment is seen being lifted to the deck and prepared for operations on the Norwegian Continental Shelf. Source: Halliburton.

more smart, and it has a lot more capabilities than any other system that we've developed," he said.

Hooker said constant evaluation from offshore operations and feedback supplied to the technology team have led to this next generation of equipment.

"When we move all of our measurements in the control system closer to the seabed, our accuracy is therefore increased. So, this tubing-hanger installation, close to zero-degree orientation deviation, is a result of us moving the whole control system and the measurements closer to the wellhead," he said.

Developing the umbilical-less system wasn't merely a mechanical challenge. It required rethinking the fundamental principles of how subsea control systems work, Helgerud said.

Key Milestones

January 2019—Aker BP tasks Optime with replacing the workover control system for horizontal trees

January 2021—Optime's ROCS deployed on NCS

May 2021—Halliburton and Optime form strategic alliance

January 2025—Halliburton purchases Optime

September 2025—eROCS deployed on NCS

"We've developed this new kind of valve, which is basically the enabler for the digital hydraulics and the way we regulate hydraulic pressure without any topside support," he said.

The V-3 digital hydraulic valve pack removes the requirement for complex manifold blocks, solenoid valves, and separate pressure regulators.

"We're taking all of those functionalities and combining them into one in one compact unit, and you could say that that is effectively the heart of the eROCs. That gives the ability to perform basically every critical function that we need, subsea, with extreme accuracy and a very low power consumption," he said.

Helgerud noted subsea operations have long relied on traditional hydraulics, which can be costly and complex, introducing "a lot of failure points." Digital actuation reduces cost and scope topside, allowing for faster operations, lower CO₂ footprint, minimal HSE exposure on the rig, and speedier mobilization and demobilization, he said.

Yet traditional hydraulics were the de facto practice because digital hydraulics required "a lot of different breakthroughs" in power distribution, electronics, and subsea communication that also needed to be combined into a new way to control actuators, he said. These elements, along with the digitally controlled valves, when combined into eROCS and OTHOS, represent "the convergence of our journey towards digitalization and mechanical reliability."

The eROCS deployed in Aker BP's campaign is the third generation of the technology.

Hooker said, "It has taken significant steps in our overall direction of simplifying subsea operations and making them safer. So, this product, it's shorter, it's removing complex pieces of the conventional equation and making it simpler, safer, and shorter duration offshore."

The first-generation tool was about 5 m long, compared with 1.7 m for the current generation. "It's the same system doing the same thing,

but better, and it's less than half the size," Helgerud said.

OTHOS eliminates the need for tubing-hanger-orientation joints and BOP-alignment systems. It consists of a main module, the orientation tool fitted with a gyrocompass, and the tubing-hanger-orientation pin.

"We're setting the tubing hanger within alignment accuracy that has never been possible before," Hooker said. Traditional alignment systems "had inherent accuracy issues that can result in a lot of rework later potentially, which is costly."

The system uses advanced instrumentation and subsea equipment feedback to align the tubing hanger with high accuracy, Helgerud said.

Rødsjø said, "Historically, when we've invented new orientation mechanisms like OTHOS in the industry, we always failed on the first two, three attempts before we were able to fix it."

OTHOS worked on its initial deployment. "The first well, we were 0.8° off of our optimum orientation, but well within the tolerance, and we've improved on that ever since," he said.

Next Steps

While this technology based on digital hydraulics has already saved millions, Rødsjø sees it as "just the start," with the Aker BP team exploring its potential for subsea interventions.

Halliburton is working to standardize eROCS and OTHOS and adapt the technologies so they can be retrofitted for older assets, Helgerud said.

Hooker said Halliburton will be applying the building blocks of its technologies to a wide range of subsea equipment, and there will be ongoing efforts to reduce the sizes of more components.

With the success of umbilical-less operations in the completion phase, Helgerud said, Halliburton is now working to extend the approach to well testing and intervention by integrating eROCS into its Veto valve for subsea testing and introducing the first umbilical-less subsea test tree system. The new system is expected to launch with a customer in the third quarter of 2026.

Looking forward, Hooker said, "We're going to see that eROCs and its specific capabilities, paired with a subsea test tree and the Veto valve, are going to change the intervention market." **JPT**