

Ship of the Year

# Taking Well Intervention to Ultra-Deep Waters

When Aker Solutions' new deepwater intervention vessel, Skandi Aker, last month was announced winner of the coveted international "Ship of the Year 2010" award, it was as much about what goes on between the vessel and the seabed as the ship itself.



A step change in subsea well intervention is coming to the offshore market courtesy of Skandi Aker, which is ready to hit the world's deepwater regions.

Cost-effective subsea well intervention rides high among oil companies' priorities for several reasons. One is simply the rapid increase in the number of subsea production wells particularly in deep and ultra-deep waters around the world. In fact, market analysts quest predicts that of all future identified subsea wells around 95 percent will be located in water depths higher than 500 metres.

Another reason is the potential additional oil and gas reserves that can be tapped. Currently the hydrocarbon recovery rate from subsea wells is approximately 30-40 percent lower than that of platform wells. Of approximately 5 000 subsea wells installed some 3 300 are still producing. Yet at an average age of almost seven years, their natural decline in production drives the need for increased oil recovery solutions.

#### Cost Effective Intervention Alternative

Traditionally subsea well intervention has been performed from drilling rigs, an automatic extension of their role in drilling and completing wells. But the sky-high rates resulting from the offshore boom of recent years have made such operations very expensive, while rig availability has been limited.

The increasing water depths also mean that it has been necessary to develop alternative technology and more cost effective systems to access these deepwater wells.

"Because of the rig market, subsea wells have been maintained at a very low level," says Stig Antonsen, Vice President Marine of Aker Solutions' oilfield services arm. "It is rig rates and availability which has

driven our initiative. We wanted to develop a platform to increase the frequency of well interventions – and one that is particularly well suited in deep and ultra-deep waters."

So far the service industry's response has been limited to the provision of the current light well intervention services from monohull vessels, which can operate at water depths up to 800 metres. To date, the record water depth for this type of operation is in excess of 400 metres, achieved through a wireline intervention without riser. Aker Solutions provided the wireline technologies for this operation.

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#### Deep and Ultra-Deep Waters

"Our ambition is to service the deepwater and ultra-deepwater subsea market in water depths down to 3000 metres. Over

the past couple of years we have developed the technology to tackle well interventions at these water depths through a solution that is attractive in price, which will help increase the frequency of intervention operations and in turn enable the subsea wells to produce more oil and gas," adds Antonsen.

Aker Solutions' subsea well intervention expertise includes its subsea well control technology, including intervention work-over systems, which is essential for safely entering a well through a subsea tree and



disconnecting quickly in the event of an emergency. In addition, Aker Solutions also performs downhole maintenance, notably wirelining and coiled-tubing operations through the company's well service business.

#### New vessel

The other key element in Aker Solutions' subsea well intervention strategy is the development of platforms specially designed for deploying the technology. This is where Skandi Aker, which is specially designed for deepwater well interventions, comes in. Through the use of such a vessel, Aker Solutions estimates it will be able to provide deepwater well intervention services at about half the cost of using a drilling rig.

"Essentially, Skandi Aker is able to perform deepwater well intervention services that oil companies previously needed drilling rigs to conduct. More importantly we do it quicker and at a fraction of the cost. This, in turn, enables us to free up scarce and expensive rig time, which allows the rigs to perform more drilling operations while we carry out the intervention work," says Stig Antonsen.

#### Services

##### Range of Services to be Offered by Aker Solutions

- subsea intervention: installation, testing and maintenance of subsea modules and top-section downhole equipment
- riserless well intervention: logging, reperforation, zonal isolation through plug-setting and removal
- riser-based intervention: coiled tubing and wireline operations, well testing and clean-up, chemical injection, circulation, sand removal, push force and scale milling (a riser is needed when you want to perform well interventions in water depths above 800 metres)

For riser-based interventions a riser is used to connect the surface installation to the well. Traditionally, riser-based intervention from a drilling rig has entailed the use of a large marine riser, typically with a diameter of 21 inches, connected to a traditional Blow-Out Preventer (BOP) installed on top of the subsea tree. Inside the marine riser is a pressure-containing workover/intervention riser.

Aker Solutions has developed a more efficient solution based on an open-water riser a slim, high-pressure riser operated without the marine riser and seabed BOP. The open-water riser is connected to a lower riser package consisting of a well control package and emergency disconnect package. This is combined with a small BOP located just below the surface installation. The whole package is lighter and can be installed much faster than the traditional equipment.

"Time is the keyword," points Antonsen out. "Our aim is to save our customers time and money through conducting well interventions at deepwater subsea wells from our vessels.

The market for this type of service is rapidly growing and we are ready for it now."

#### Oil Onboard

Skandi Aker is the first intervention vessels to classified according to DNV's WELL notation, meaning the vessel is able to take hydrocarbons on board. As a result, the vessel can perform well-testing and clean-up, flaring off hydrocarbons through a flare at the stern. The vessel can also perform through tube rotary drilling with coil and downhole motor, and managed pressure drilling.

The 157 metre long ship is the largest monohull subsea well intervention vessel built, boasting a large deck space, heavy capacity subsea cranes, excellent sea-keeping performance, all interventions using dynamic positioning system, and 18 knots transit speed. She is equipped with a module handling system and a 400-ton AHC crane.

#### Multi-purpose vessel

While Skandi Aker's main activity will be deepwater well intervention, it is also designed to solve other tasks such as subsea construction and installation activities.

"A unique feature about Skandi Aker is her multi-functionality. When she is not performing well intervention work she can perform subsea installation and construction work, handling 225-ton structures in down to 3000 metres water depth," adds Antonsen. Skandi Aker is currently performing subsea construction and installation work offshore West Africa. This multi-functionality will undoubtedly provide oil companies increased flexibility as the vessel can perform installation and construction work while the next subsea well is being readied for well intervention work.

#### Ship of the Year 2010

The vessel's multi-functionality is one of the reasons why Skandi Aker this year won the 2010 Ship of the Year award. The award was presented to Stig Antonsen by Rikke Lind, state secretary of the Norwegian Ministry for Trade and Industry, at the SMM 2010 trade show in Hamburg, Germany.

"We were very proud to receive the Ship of the Year-award. It is a prestigious award which is an excellent recognition of Skandi Aker's unique deepwater well intervention system and capabilities as well as the ship itself," concludes Antonsen. Skandi Aker has been built at STX Norway Offshore's yard in Søviknes, Norway. The vessel is owned by Norwegian company DOFCON ASA. ■

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