
Press release

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Compressor Technology for First Unmanned Norwegian Gas-Production Platform

- **Major order from Aker Solutions and Aibel comprises seven compressor units for three offshore oil and gas production platforms operated by Aker BP**
- **Two HOFIM® motor-compressor systems to be deployed for an unmanned gas production platform**
- **MAN digital solution allows fully automated operation of compression technology**

MAN Energy Solutions has received three orders for a total of seven compressor systems. These will be delivered to the Aker BP-operated production platforms, Hugin A and Munin, in the Yggdrasil area, and a new production and wellhead platform (PWP) in the Valhall field centre.

The Valhall field is located around 290 km off the southern Norway coast, close to the maritime boundary with Denmark, and has produced over a billion barrels of oil equivalents since starting operation in 1982. The MAN compressor system there will be deployed by Valhall PWP-Fenris, the new platform development project, which will extend the field's lifespan and more than double its gas-processing capacity. Yggdrasil, situated northwest of Stavanger, is the next major field development on the Norwegian shelf with gross resources of more than 700 million barrels of oil equivalent. The Yggdrasil area will be remotely operated from an integrated operations centre and control room onshore in Stavanger. The Munin production platform, which is part of the development, will be designed from the start for crewless operation with neither helicopter deck nor living quarters. Munin's topside will be provided by Aibel, while MAN's scope of work encompasses the delivery of two compressor units as well as a comprehensive digital solution designed to fulfil the requirements for remote operation. The Yggdrasil area is expected to begin production in 2027.

Basil Zweifel, Senior Vice President, Head of Sales & Project Management at MAN Energy Solutions, said: "This unmanned and remotely-operated Munin gas platform represents a leap forward for the energy industry. It not only enhances personnel safety and reduces OPEX, but also minimises the environmental impact of offshore operations. We are extremely honoured to be part of these exciting projects and are looking forward to collaborating with operator, Aker BP, and its strategic partners. MAN Energy Solutions has the ideal blend of mechanical and digital expertise required for the task and will provide our highly digitised HOFIM® compression technology, which has already proven its ability to practically run autonomously, uninterrupted and maintenance-free at the Åsgard field at 300 metres depth."

Peter Kupka, Project Director for Fixed Facilities in Yggdrasil at Aker BP, said: "At Aker BP, our ambition is to create the oil and gas company of the future, characterised by minimal emissions, low cost, profitable growth and attractive returns. A key part of this involves adopting new ways of working, and remote

operations are essential to our strategy moving forward. In Yggdrasil, implementing and utilising the HOFIM® compression technology plays an important role in our technological advancement required for remote operation. We are very pleased to work together with MAN Energy Solutions to drive improvements and optimise performance throughout the compressor systems' lifespans."

The HOFIM® compressor systems are equipped with remote-operation capabilities, enabling the operator to monitor and control the compression system from onshore.

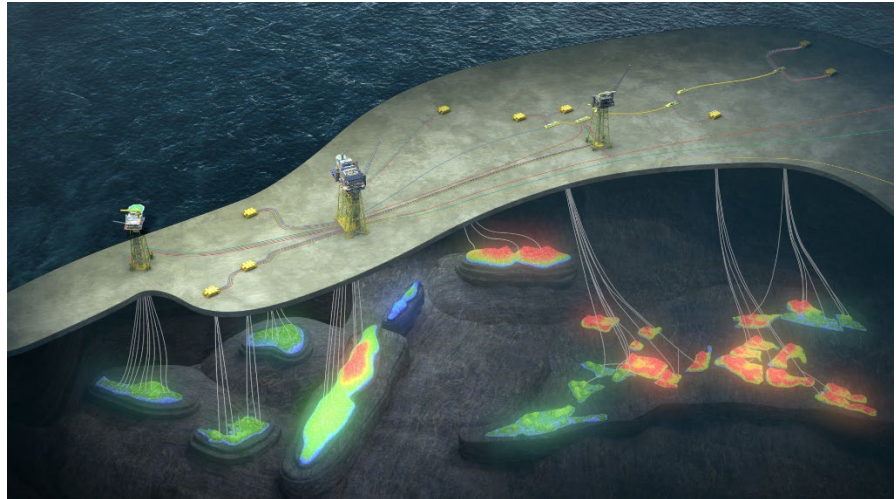
Jörg Massopust, Head of Digital Sales & Alliances at MAN Energy Solutions, said: "With its cutting-edge digital solutions, MAN Energy Solutions is forging a path towards more sustainable and efficient gas-production. Designed specifically for deployment on unmanned platforms, our advanced digital solution for compressor systems offers a wide array of features. MAN's online performance monitoring app provides real-time insights into system performance, allowing for proactive decision-making and optimisation. Additionally, virtual sensors allow operators to validate measured data in real time, increasing operational efficiency and accuracy while, leveraging machine learning capabilities, the system also continuously learns and adapts to improve performance over time. Moreover, the predictive and prescriptive maintenance feature ensures proactive maintenance planning that minimises downtime and maximises productivity. With production and performance optimisation functionalities, our digital-twin solution unlocks the full potential of compression systems, enabling unprecedented levels of efficiency and effectiveness."

MAN Energy Solutions' scope of delivery for the three projects comprises the supply of five HOFIM® compressor units and two RB compressor skids:

- **Munin:** two HOFIM® compression units as low-pressure and high-pressure compressors for gas export;
- **Hugin A:** two HOFIM® compression units for gas export as well as two radial barrel compressor skids as gas lift (size RB 28) and first- and second-stage re-compressors (size RB 35);
- **Valhall:** one tandem HOFIM® compression unit for gas export.

Each HOFIM® compressor unit will feature frame-size RB 45 compressors – with an integrated MAN high-speed motor, size M43. The HOFIM® unit for Hugin A features an overhung compression stage on the opposite side of the motor to increase the overall pressure-ratio capability. The units will be developed, manufactured and tested at MAN's premises in Zurich, Switzerland.

The HOFIM® compressor system is hermetically sealed and oil-free, and employs seven-axes active magnetic bearings. The compressor design accordingly dispenses with a large number of components typically seen in conventional topside compressor solutions, including gearbox, lubrication-oil system, instrumentation and valving. The same technology is already in use by MAN subsea compressors operating in Equinor's Åsgard field at 300m depth with more than 120,000 accumulated running hours without intervention and with an availability of close to 100%.



Visualisation of Yggdrasil field development (picture ©Aker BP)



The Munin gas production platform will be remotely operated from onshore (picture ©Aibel)



PWP-Ferries platform development project at Valhall field (picture ©Aker BP)



HOFIM® compressor system by MAN Energy Solutions (picture ©MAN Energy Solutions)

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.