

The new wave of motion compensation



Wind farms are an essential part of powering the future, but installation can be challenging as the best locations for wind farms are often at sea. If the sea is rough, it can put a stop to installation entirely, or even damage expensive equipment. Bosch Rexroth, together with Seaway 7, has engineered a motion compensator system which ensures safe and efficient installation in even the most challenging conditions.

Improving sustainability is one of the biggest challenges facing the world today. The need for energy will continue to grow as the global population is consistently rising, and the energy consumption per household and per industry is increasing. In order to protect our environment, and our future, we need to produce as much of this energy as possible in a sustainable way. Wind farms are one of the most reliable ways to produce renewable energy, and energy providers are always looking at the best ways to build install them in optimal locations.

These locations are often at sea, and the challenge is that the best places for them frequently experience high-speed winds, which makes the installation process more difficult. The vessels which install the monopiles for offshore wind-farms need to be able to compensate for motion, as it's crucial that the monopile is installed with high accuracy and stability.

Bosch Rexroth has developed for Seaway 7 the optimal solution. Usually, vessels built for installing monopiles have two systems to reduce potential movement at sea – a dynamic positioning (DP) system to keep the ship in place, and a motion compensated system to control the movement of the monopile gripper. Bosch Rexroth, together with Seaway 7, found a way to effectively integrate these two separate systems, which resulted in a number of significant advantages.



INNOVATION THROUGH COLLABORATION

The integration between the motion compensation on the gripper and the DP is unique, and the success of this world-first is thanks to the collaborative approach between Bosch Rexroth and Seaway 7.

“We worked intensively with Seaway 7,” says Peter Doesburg, International Marketing and Sales on Large Projects for Bosch Rexroth, “as we needed to know everything about how the vessel behaves. This is what influences the gripper and the compensating systems, and everything needs to work together to make it as efficient as possible.”

Bosch Rexroth engineered and supplied the four hydraulic cylinders which sit around the gripper at 90° angles from each other. These are motion compensated, and they physically move the monopile to keep it steady and stable in unstable environments. However, the innovation came with control system, and the way everything was integrated with the DP.

“Seaway 7 are renowned for innovation, and for using technology to do things in a safer, better and more efficient way,” adds Peter. “They consider Bosch Rexroth as the ideal partners, as we also pride on ourselves in combining an innovative approach with our engineering expertise to achieve the best results. We’re proud that together, we built the best and only monopile installation system in the world that’s integrated in this way.”

THE FIRST OF MANY

While this system is unique now, it could benefit the entire industry when similar systems are installed on other vessels, which will allow them to be operational on more days throughout the year, so increases the number of wind farms that can be installed.

It’s more essential than ever to reduce costs too, as the wind energy industry is no longer subsidised. Through the increased efficiency combined with reliability and uptime, this system makes it less expensive to install wind farms at sea.

“The system was installed on the Seaway Strashnov vessel over two years,” explains Peter. “Everything was integrated by the beginning of 2019, with successful tests carried out after that. Seaway 7 conducted a successful test with this solution in the end of 2019, and is very enthusiastic about this solution and the opportunities it presents.”

Until now, DP systems and motion compensators were separate systems, and through this integration and innovation Seaway 7 and Bosch Rexroth have provided something which changes things for the better. It also helps to reduce the costs of wind farms, which means in the future it will be possible to build more, which in turn will help us all live in a more sustainable way.