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UPTIME LAUNCHES DIGITAL ECOSYSTEM

EFFICIENT LOGISTICS WITH SMALLER FOOTPRINT

Uptime International in Karmøy north of Stavanger has developed a digital ecosystem which ensures intelligent and autonomous operation of gangways connecting two floating units. The company is thereby ready to support floating wind power – the next big renewable-energy breakthrough.

Benefits offered by the ecosystem range from safer logistical operations, faster execution of operations, reduced fuel consumption and CO₂ emissions from service vessels, and not least increased uptime for the wind turbine.

Uptime has delivered more than 140 motion-compensated gangways to the international markets for offshore petroleum and wind power since 1979.

The company ranks as the world leader for walk-to-work operations between ships and offshore wind turbines. Put briefly, this involves delivering secure gangways for use by technical personnel conducting maintenance or other work and for loading/discharging equipment – all in demanding weather conditions.

Next offshore wind adventure

“The next offshore wind adventure will take place in deep water, and we have developed technology which handles the challenges associated with this,” says CEO Knut Chr Hovland at Uptime International.

He explains that 80 per cent of the world’s wind resources are located in areas where the water is so deep that floating units permanently moored to the seabed will be required.

Huge global expansion forecast

Hovland refers in part to a report (Menon publication no 53/2022) from Norway’s Menon Economics, which forecasts a sharp rise in the pace of floating wind development from 2030 to reach an installed capacity of about 50 GW by 2035. After that date, Menon expects growth to pick up even further towards a global floating wind capacity of 210-310 GW in 2050.

“Space is starting to become scarce in areas where the water is shallow enough for wind turbines to stand to the seabed,” says Hovland. “Floating wind can deliver power on a large scale directly to global markets. That makes it the next step.”

Turbines and ships out of step

Andreas Seth, senior vice president for rental and services at Uptime International, reports that one of the challenges with floating wind is that both turbines and service vessels are subject to wave motion, and are thereby often out of step with each other.

“These units move independently of each other, particularly with much wind, currents or waves,” he observes. “Under such conditions, it can be difficult to know with any certainty whether it is safe to land the gangway from the ship to the turbine, or to disconnect it.”

Moving service personnel and spare parts efficiently between vessel and turbine is influenced by the fact that both units are constant motion. Landing the gangway on the turbine is often especially challenging, particularly in bad weather.

“Strong currents represent a particular challenge since they are less predictable than wind and waves,” says Seth. “We therefore also measure the relative angle in relation to the landing point in the horizontal plane

so that the vessel can correct for deviations at an early stage.”

Flexible and self-learning

The company is now developing an ecosystem comprising a set of digital solutions which will make it easier to control gangway operations remotely or make them autonomous.

“This system continuously registers, analyses and learns from the loads involved,” explains Seth. “It gives the operator insight and decision support, which help to make the job ever more efficient and profitable, with an ever smaller environmental footprint.”

UPTIME Digital Ecosystem

The collective designation for the company’s solution is UPTIME Digital Ecosystem. This flexible and self-learning product currently comprises components for gangway control, digital tracking of personnel and equipment moving over the gangway, and an automated pallet robot.

These components are tied together through a cloud service which utilises and systematises the data to improve decision support across ship and operations. Uptime envisages introducing additional functions and services in coming years, in part through the UPTIME COLLABORATE cloud service.

Completely new control system

UPTIME CONTROL is the brain of the gangway system. Seth explains that it will ensure autonomous landing on the floating turbine.

“Put very simply, this means that a camera on the gangway focuses and latches onto a point on the turbine, and compensates in relation to that. The control system simulates a landing using the actual weather data, and identifies a safe place to land for itself.

“These assessments are currently made by the operator controlling the gangway. The special demands posed by floating wind power have demanded the construction of a completely new control system from the ground up.”

Contributing to the green shift

To reduce costs and the environmental footprint, energy and shipping companies involved with offshore wind need to cover as many turbines as possible per service vessel and ensure the greatest turbine uptime.

“Turbine downtime equals lost green power generation,” Seth emphasises. “It’s therefore important that the time required to connect and disconnect the gangway, transfer and return personnel and equipment, and carry out turbine service is as short and secure as possible.

“In addition to providing safe access for service personnel, our digital ecosystem helps to enhance efficiency, reduce energy consumption and emissions from the vessels, and increase turbine uptime – thereby contributing to the shift to green and renewable energy.”

For more information, contact

Uptime International AS

Knut Chr Hovland
CEO

knut.hovland@uptime.no

+47 922 56 173

Andreas Seth

Senior vice president, rental and services

andreas.seth@uptime.no

+47 957 60 825

Read more about the UPTIME Digital Ecosystem below.





UPTIME

Digital ecosystem

UPTIME Digital Ecosystem is a robust solution which is ready to tackle present and future requirements for autonomous and intelligent operations. It systematises and applies data for decision support in order to improve safety and efficiency, reduce energy consumption and emissions to the environment, and increase uptime for the end user.



CONTROL

Walk to work services control system

Time saved in the connection phase

The UPTIME CONTROL system handles several degrees of motion with two floating objects simultaneously. Its capabilities include ensuring faster and safer gangway landing and operation in bad weather.

UPTIME CONTROL utilises sensors, camera and radar technology, and machine learning to achieve autonomous control and autolandings of the gangway.

The control system's digital twin makes provision for remotely controlled operation, automation, analysis, reporting and monitoring of equipment, and operation from the operator position or from land, including predictive maintenance.



COLLABORATE

Operational and business analytics

Better decisions

The UPTIME COLLABORATE cloud service is the nervous system in UPTIME Digital Ecosystem, and will contribute to planning and executing operations based on documented experience and data directly transmitted from the rest of UPTIME Digital Ecosystem. It can also exploit windows of opportunity by utilising third-party inputs such as weather and vessel data.

UPTIME COLLABORATE draws on insights from current and earlier operations to understand, improve and optimise operations – including across vessels and fleets. Effective operation time for gangways, with fast connection, logistics and disconnection, improves service vessel operability and reduces wind turbine downtime.



TRACK

Crew and cargo tracker

Safer operations

Uptime is also launching a solution for real-time digital tracking of personnel and equipment moving over the gangway, on the service vessel and on the turbine. This service has been named UPTIME TRACK.

In addition to protecting safety, UPTIME TRACK is tied to the control and cloud system and can help to reveal and assess deviations and bottlenecks in flows of personnel and goods between wind turbine and service vessel.

With real-time tracking, the traditional camera system will be supplemented by full oversight of where personnel and equipment are located on their way to or from the wind turbine.



TROLLEY

Autonomous cargo handling

Avoid manual trolley handling

Uptime is developing an autonomous pallet robot for transporting goods and equipment between service vessel and wind turbine. This means personnel avoid manual trolley handling and ensures safer and more efficient transport of goods to and from the wind turbine.

Named UPTIME TROLLEY, this autonomous robot is connected to other digital and physical logistics systems via the UPTIME COLLABORATE cloud service.

It is an agile and efficient robot which autonomously handles loading and discharging of cargo. The aim is to reduce time and resources devoted to logistics and thereby increase personnel capacity to execute the actual service and maintenance assignment.

UPTIME TROLLEY has been developed with Solwr, a technology company which specialises in enterprise resource planning (ERP), integration, automation and robotics.