

Blackout Safety for the Energy Transition: TenneT, ABB, and EuroSkyPark ensure communication for DolWin5



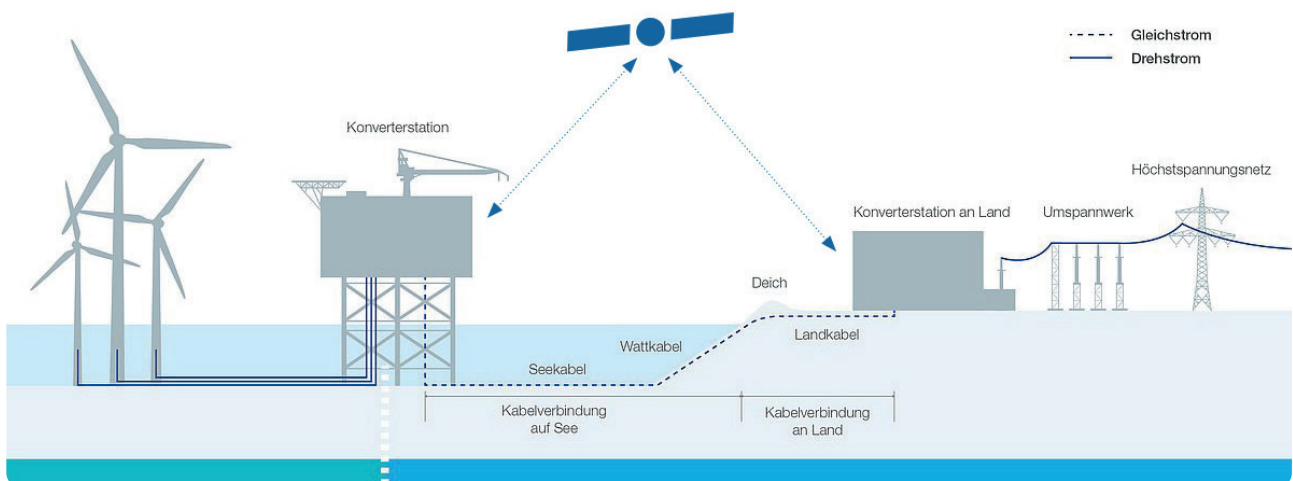
For the offshore grid connection system DolWin5, the satellite communication provider EuroSkyPark (ESP) supplies both primary and back up connection up to the commissioning and the redundant data transmission systems. As market-leading SCADA provider for satellite transmission, ESP is able to guarantee station blackout safety even in the extreme environment of the North Sea. The company from Saarbrücken in Saarland, Germany, ensures the connection of pan-European wind and solar parks as well as of traditional power plants. With many years of field experience, ESP is a hidden champion of the energy transition. At the latest Factory Acceptance Test (FAT) carried out by TenneT, being the leading offshore transmission system operator in the EU and a long-standing customer, the ESP solution has once again received an A+ grade both from TenneT itself and from ABB as the system integrator involved in DolWin5.

Offshore wind farms are massive power stations. In Germany, most of them are located more than 100 kilometres off the coast in the North Sea. To feed the generated wind energy into the extra-high voltage grid ashore with as little loss as possible, a so-called high-voltage direct current (HVDC) is needed. For the DolWin5 project, however, TenneT implements an offshore grid connection system with extra-high-voltage direct current (EHVDC) technology and an output of 900 MW. DolWin5 will connect the wind park Borkum Riffgrund 3 with the extra-high voltage grid ashore. This is not the first joint-venture that ESP and TenneT implement jointly. After all: "Without high-performance communication technology, such a grid connection cannot be operated at all," technical specialist Michael Klein explains, responsible for "Large Projects Off-shore" at transmission system operator TenneT.

Already long before the commissioning of a wind park, data transmission is needed for construction and all test phases. At this stage, ESP's technology provi-

des the primary connection for the communication. But during operations, when fibre-optic cables in the seabed become the primary transmission channel, satellite technology will continue to be needed. After all, the safety and control technology must be absolutely reliable for both wind park and grid connection. "Breakdowns and malfunctions could have disastrous effects on the entire power grid," Michael Klein warns. This requires a high degree of redundancy, which is provided by ESP – going into space and back. That far away, satellite technology represents the sole option, and the ESP solution is the only one that guarantees a station blackout safety of 99.99 % for such large facilities. "What we offer here is far more than an emergency scenario," Patric Niederprüm in his function as responsible Planning Engineer at ESP explains. "It is an equal second system, which can seamlessly take over and control the entire wind park – with its total of 900 megawatts – in any weather condition and in virtually any scenario. In case of emergency, this happens smoothly and absolutely seamlessly."

Entire Facility can be Seamlessly Controlled via Satellite



People and Technology Put to the Test

To put this promise to the test, the implementation of the technology is preceded by multiple inspections. One of them is a Factory Acceptance Test (FAT), which for DolWin5's HVDC has been carried out by Michael Klein. The onsite test in Saarbrücken included the testing of all specifications, the comparison of the measured values, the commissioning, and the testing of different operating scenarios. In addition, the facilities were checked with the help of TenneT's satellite ground station near Hannover. ABB from Sweden accompanied the testing as well. For five hours, the technicians intensely engaged in reviewing all the system's details and specs until Michael Klein gave it a thumbs-up. "ESP not only provides highly available

systems but also the necessary professionalism," the experienced offshore-project technician says, explaining his positive judgment. "We already know this from years of partnership. The employees are excellently versed and have completed system trainings at the manufacturer premises in South Korea as well as comprehensive offshore trainings. Additionally, ESP has all the required certificates, is flexible and reliable, and respects deadlines. This, too, is indispensable for the cooperation with a large system operator such as TenneT."

That much praise invites exuberance, but Patric Niederprüm remains objective: "After the test is before the test," the experienced engineer knows. "The next step preceding the actual commissioning is the Site Acceptance Test. If successful, power will flow up to the extra-high voltage grids on the mainland: without interruption, predictably, and continually. Ultimately, this is the prerequisite for the energy transition."

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