PFISTERER

Premiere at offshore grid connection: Highly flexible HV cable with pluggable connection system tested

In the project for connecting the DolWin gamma converter station, for the first time a cable system consisting of a highly flexible 155 kV high-voltage cable with solid-insulated, pluggable Connex size 6 connection system and gas-free epoxy resin joints from Pfisterer has been successfully tested and installed under real conditions on an offshore platform. The foundation stone has therefore been laid for global use of the Feltoflex connecting line in combination with the Connex connection system in the offshore area.

Offshore platforms for wind farms are becoming increasingly compact. The space-saving design represents a new challenge for the cabling. This was shown in impressive fashion in the onshore installations for the DolWin gamma platform, which are now complete. The platform is currently being developed in the southwestern North Sea as the third connection of the DolWin cluster, and belongs to the offshore network connection project of transmission grid operator TenneT, in which two sister platforms are being connected using an innovative bridge system with the aid of a flexible high-voltage cable with a conductor cross-section of 800 mm² for the first time. DolWin3 is being built by GE as the prime contractor in the consortium with the shipyard.

Concept for complicated cable pulling

The cable laying for DolWin3 is based on a sophisticated concept. The extremely flexible and also heavy Feltoflex cables run over several platform levels and through extremely low spaces, some of which are only one metre in height. "The tighter it gets, the more difficult it is to lay HV cables with a diameter of about 98 mm and weighing approximately 16 kg per metre. In the tightest spaces, the so-called confined spaces, it was vital for the cables not to be damaged by other parts during the complicated cable pulling. We succeeded in installing the cables without errors thanks to a high degree of planning and organisation effort and with a team that is experienced in handling the Feltoflex cable", says Vukasin Basara, project manager at Pfisterer, describing the special requirements.

Compact design for confined spaces

A total of four internal HV cable systems with size 6 Connex connectors and epoxy resin joints were installed onshore. The dry-pluggable Connex joint, which is designed for voltage levels of up to 170 kV, is a new development by Pfisterer. Its lightweight, compact design predestines it for use on confined platforms. Because of the solid insulation it is extremely easy to handle, since no oil or gas work is required on site. The joint is also extremely flexible, as shown at DolWin gamma. It connects the internal Feltoflex cable systems with a sea cable which has a different cable cross-section and has been insulated with different materials. Flexible also means that the cables can be quickly disconnected from each other via the plug-connector system for testing purposes, for example.

Premiere: Highly flexible 155 kV cables with pluggable Connex connection system have been installed on the DolWin gamma platform. The onshore installation is therefore complete. Offshore installation by Pfisterer will be the next step. In the middle of June the plattform already left the dock in Warnemünde.

The HV installation was tested with a resonance testing system from an external testing institute.

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Customer-specific testing

The HV cable connections with the solid-insulated Connex connection system have successfully passed the extensive tests under real conditions. "Since each platform is planned individually, the customer requirements are diverse and complex accordingly. For DolWin gamma we tested the cable systems in accordance with the TenneT specification, whose test values are higher than those of the actual far-reaching IEC 60840 standard test", explains Vukasin Basara. The experience that has been gained onshore will be used in a targeted way for the offshore installations which will be starting shortly. These will initially begin with the laying of two medium-voltage cable systems for the platform's auxiliary power This will be followed by the installation of for six high-voltage cable systems. When this is done, DolWin alpha and DolWin gamma will be the first two sister platforms to have been connected via a bridge with a highly flexible 155 kV cable. With a length of more than 200 m, this will also be the longest connection between two platforms worldwide.

About PFISTERER

PFISTERER is a leading independent manufacturer of cable and overhead line accessories for sensitive interfaces in energy networks. The Group is headquartered in Winterbach, near Stuttgart in southern Germany. PFISTERER develops, produces, and sells internationally successful solutions for 110 V to 1,100 kV voltage levels. With its end-to-end range of products for application in energy networks, consulting, installation, and training, the manufacturer is a valued partner to companies specializing in power supply, plant construction, and electrified rail transport around the world. PFISTERER operates production plants in Europe, South America, and South Africa, as well as sales offices in 18 countries across Europe, Asia, Africa, South America, and the USA. The Group employs around 2,700 employees following the recent acquisition of LAPP Insulators Holding.