

CONNEX Gives Power Transformers Mobility for Emergency Use

A reliable power supply is based on power transformers that function efficiently. Yet many systems in the USA have been in service for a great many years and are therefore prone to faults. Further risks to grid stability include environmental disasters and violent attacks on substations. Mobile emergency transformers enable power to be restored in a very short time after a failure. This new safety concept is made possible by the CONNEX pluggable connection system from PFISTERER. Power transformers equipped in this way are easy to transport, versatile in use, and quick to install.

Mobile emergency transformers are an innovative way of making the heavily used power grids in the USA more reliable in operation. One reason for the increasing number of power failures is the extended service life of the transformers, the majority of which were installed between 1950 and 1970. As their age increases, they become more susceptible to faults. Acts of nature, such as earthquakes, floods, or hurricanes, as well as deliberate physical or cyber attacks also result in power failures. In these events it is a matter of restoring power to the local supply area as quickly as possible. But transformers are usually unique, customer-specific designs which take up to a year to construct. This delay can be bridged by a mobile emergency transformer which can be installed within 96 hours.

Flexibility of pluggable HV-CONNEX connections

A power transformer is made suitable for mobile emergency use by means of the solid-insulated, fully encapsulated CONNEX connection system from PFISTERER. The CONNEX device connection component is permanently installed on the transformer and functions as a standardized interface, by means of which a variety of components can easily be inserted or replaced at any time. CONNEX covers all voltage levels from 12 kV to 550 kV and, with its wide range of cable fittings, solid-insulated surge arresters, plug-in bushings, joints, and voltage testing systems, it represents the largest available range of pluggable products. "At PFISTERER, we recognized many years ago the growing need for transformers with compact connection technology and set about creating the technical solutions to this problem. As a result, energy supply companies can now respond promptly to transformer failures, without having to keep a stock of expensive and redundantly installed standby transformers," explains Eduardo Santana, Director Business Unit Cable Systems.

Switching transformers quickly and reliably

Thanks to the universally pluggable CONNEX interface, the installation time is reduced by about 75 percent compared to conventional transformers with permanently installed bushings. This is because the oil-filled transformers are delivered ready for operation, as they have been pre-tested at the factory, complete with their bushings. This eliminates the need for any time-consuming



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oil and gas work on site, as is usual with conventional systems. The same applies for the replacement of a CONNEX bushing. It too can be simply unplugged and replaced with a new one – without any laborious oil preparation. The first pluggable HV-CONNEX bushing size 7-S – specially designed for mobile emergency transformers and for high-voltage levels up to 362 kV – was delivered in 2015.

Easily transportable

When it comes to mobility, the size and weight of a transformer are the key determining factors. In comparison with a permanently installed bushing, the pluggable CONNEX connection component requires considerably less space in the transformer. This enables the transformer to be designed as a compact cube with a lower weight. This space-saving unit can easily be transported on a standard truck. The solid-insulated bushings are simply unplugged for transportation, or conveyed in their installed position on the transformer.

Versatile in application

As it is impossible to predict in advance at which location a mobile transformer will be needed, it must be fully equipped for a variety of situations. For this reason, PFISTERER has developed an extensive connection system. This means that a connection via extra-high-voltage cables is just as possible as by cables carrying 138 kV or 69 kV. As one emergency transformer covers several voltage levels, the capital investment costs, storage requirements and logistical expenses are all reduced.

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.