First use in the high-voltage grid: SF$_6$-free circuit breaker from Siemens for Netze BW

Siemens has received an order from the distribution grid operator Netze BW GmbH to modernize and expand its 110-kV transformer substation in Nördlingen. Siemens will install its new 3AV1 outdoor circuit breaker with vacuum-interruption technology and a combined voltage and current converter, including clean-air insulation, in a 110-kV high-voltage grid for the first time. The switchgear thus requires no SF$_6$ insulating gas. The order also includes retrofitting and expanding the existing air-insulated switchgear, including protection and control systems and work on cables and overhead lines. The new equipment is expected to be commissioned by the middle of 2018.

Distribution grid operator Netze BW GmbH is a member of the EnBW Group. It operates the power distribution grid in large parts of Baden-Württemberg, Germany, as well as in outlying areas of adjacent federal states.

The high-voltage circuit breakers and gas-insulated switchgear from Siemens – with vacuum-interruption and clean-air technology in the high-voltage range – are upgrades to the circuit breakers and switchgear that work with sulfur hexafluoride (SF$_6$) as the insulating, switching, and extinguishing gas and will remain in the product line. A vacuum-interrupter unit switches and extinguishes the arc, while technically prepared and purified air in a mixing ratio of 80 percent nitrogen to 20 percent oxygen (known as clean air) provides the insulation for the current-carrying conductors inside the housing. Siemens has further developed its existing insulation and extinguishing technology according to climate-neutrality requirements by combining vacuum-interruption systems for switching and for arc extinguishing with clean air as the high-voltage insulating medium.
Siemens has been using its vacuum-interruption technology in its medium-voltage switchgear and in high-voltage circuit breakers up to 72.5 kV for more than 40 years. With its new circuit breakers and switchgear, the company is expanding the application of vacuum-interruption technology for a rated voltage of up to 145 kV, a rated short circuit-breaking current of up to 40 kiloamperes (kA), a rated current up to 3,150 A, and operating temperatures between -55° Celsius and +55° Celsius. This broad range of applications makes the new circuit breakers and encapsulated switchgear suitable for many purposes in both outdoor and indoor installations. Due to the lower insulating capacity of natural gases, the gas-insulated clean-air switchgear have slightly larger dimensions than the SF₆ switchgear. However, its energy transmission efficiency is equally high in practice. The vacuum-interruption technology combined with clean-air technology provides operators with many advantages, including easier handling during shipping, installation, and operation as well as during maintenance and recycling. In addition, reporting the quantity of gas used in the devices isn’t required.

This press release and a press picture are available at
www.siemens.com/press/PR2017070353EMEN
For further information on Division Energy Management, please see
www.siemens.com/energy-management
For further information on circuit breaker, please see

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Further information is available on the Internet at www.siemens.com.