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PG&E to use SF_6-free high-voltage products from Siemens

- **Vacuum circuit breakers and clean air insulation replace SF_6 as extinguishing/insulating medium**
- **Dead-tank circuit breakers up to 115 kV**
- **Gas-insulated switchgear (GIS) for 115 kV, 50 kA**

Siemens has received orders from its customer Pacific Gas and Electric (PG&E) to supply SF_6-free dead-tank circuit breakers and gas-insulated switchgear (GIS). They are destined for California's 115-kilovolt (kV) high-voltage grid. The orders comprise dead-tank circuit-breakers for 72.5 kV and 115 kV as well as GIS for 115 kV. These circuit breakers use vacuum interrupters for switching functions and treated air known as "clean air" as the insulating medium. It's now possible to eliminate the use of sulfur hexafluoride, and this order is a major step forward for Siemens' SF_6-free portfolio. The first delivery will take place in mid-2019. PG&E, one of the leading energy providers in the United States, launched a company-wide initiative in July of this year to cut greenhouse gas emissions from its operations by one million metric tons. One element is to use highly sustainable electric switchgear. "We are very pleased with the development of more and more SF_6 free solutions for high voltage applications. They support PG&E at meeting the challenge of climate change while providing affordable energy to its customers", says Tom Rak, Manager of Substation and T-Line Standards Engineering at PG&E.

"In recent years, Siemens has been hard at work developing a new generation of high-voltage products that offer outstanding performance and sustainability. Our goal is to offer SF_6-free high-voltage products preferably on all voltage levels in power transmission. They can already be used in many sectors," explains Ralf Christian, CEO of the Siemens Energy Management Division.

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“We’re happy to be joining PG&E in taking the next steps toward sustainable power transmission with no greenhouse gas emissions and to implement the easiest possible operating and recycling processes. This is one way that we’re doing our part to achieve the global climate protection targets,” says Beatrix Natter, CEO of the Transmission Products Business Unit within Siemens Energy Management. The 3AV1 DT dead-tank circuit breakers offer a rated voltage of 115 kV, a rated short-circuit breaking current of up to 40 kiloamperes (kA), and a rated current of up to 3,000 amperes (A). The 8VN1 GIS feature a rated voltage of 115 kV, a rated short-circuit breaking current of 50 kA, and a rated current of 3,000 A.

SF_6-free circuit-breakers and GIS are a further development of insulation using SF_6, which has been proven in practice for years. A modern vacuum interrupter unit handles the switching and arc-extinguishing functions. Industrially 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 developed its existing technology to meet climate neutrality requirements by combining vacuum interruption systems for switching and for arc extinguishing with “clean air” as the high-voltage insulating medium.

The first milestones in SF_6-free switching technology from Siemens were the successful deployment of vacuum interrupters in outdoor circuit breakers, which have been in use since 2010. SF_6-free GIS for 72.5 kV have been used in wind turbines and the first SF_6-free outdoor circuit breaker in the German 110-kV high-voltage grid since 2018. The benefits of this technology over conventional SF_6-insulated switchgear are significant: high switching power with the same footprint for outdoor and dead-tank circuit breakers. The products can be operated at lower temperatures without their own heating systems, and the switching unit requires no maintenance. They don’t require F-gas reporting during operation and are much easier to recycle. “Clean air” can be released into the atmosphere with no harmful effects. The circuit breaker has a lifecycle of 40 years, which is the same as the variants with SF_6. The products therefore meet global manufacturer and grid operator targets with respect to climate-neutral operation, decarbonization, and sustainability.

Pacific Gas and Electric Company, a subsidiary of PG&E Corporation (NYSE: PCG), is one of the largest combined natural gas and electric energy companies in the United States. Based in San Francisco, with more than 20,000 employees, the company delivers some of the nation's cleanest energy to nearly 16 million people in Northern and Central California.

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