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ABB celebrates 50 years of pioneering gas insulated switchgear technology

Gas-insulated switchgear transformed power grid possibilities and continues to enable grids and smart cities

Fifty years ago, ABB (erstwhile BBC) installed the first GIS in an underground substation in the heart of Zurich, Switzerland, enhancing the city's power supply, conserving space and starting a revolution that continues to shape the way power is transmitted and distributed.

GIS is a compact, metal encapsulated switchgear that uses pressurized insulating gas, enabling safe operations in confined spaces while significantly reducing equipment size. This revolutionary technology was a key enabler for urbanization. Occupying only 10 percent of the space of an AIS substation, it allows substations to be built within cities to supply safe and reliable power. Substations are no longer taking up acres of open spaces but can hide within buildings, underground or on rooftops.

Prior to the advent of GIS, air-insulated switchgear (AIS) was the norm, using air as the insulation medium. This meant more exposure to the elements of nature and required more space and safety considerations. With GIS, a substation the size of a football field can be shrunk to a tennis court, allowing cities to preserve valuable space and maintain urban aesthetics.

"Pioneering GIS technology in the 1960s was a ground breaking milestone in our constant quest for innovation", said Giandomenico Rivetti, head of ABB's High Voltage Products business unit, within the company's Power Grids division. "50 years of continued innovation has enabled a stronger, smarter and greener grid, bringing reliable supply of electricity to hundreds of cities and millions of people around the world."

Over the last five decades, having installed more than 30,000 bays worldwide, ABB has continued to innovate and make significant advances in this technology, including higher transmission capacity with ever reducing footprint, digitalization and eco-efficiency. Voltage levels have gone up from 72.5 to 1,200 kilovolts (kV) to secure greater power transmission with minimal losses. 1.2 million volts is the highest alternating current (AC) level in the world – like a giant switch capable of switching on and of the average annual consumption of a country like Switzerland and facilitating transmission of power across 2,000 kilometers.

At Hannover Fair 2018, ABB is displaying its latest innovation in this field with a digitally capable version of the world's first GIS using an eco-efficient gas mixture as an alternative to SF₆, successfully operating at a substation site in Zurich. This breakthrough enables a reduction of global warming potential (GWP) by almost 100 percent, compared to SF₆. Equipped with advanced digital controls, supervision and monitoring, this latest GIS is ready to enable digital substations, key to the development of smarter grids.

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130

years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner of Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 135,000 employees. www.abb.com

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