PRESS RELEASE

Nexans completes successful qualification testing of 'Best Paths' superconductor cable for HVDC power links

- *EU-funded 'Best Paths' project has created a new modular HVDC superconductor cable system designed for bulk power transmission over long distances with minimal resistive losses.*
- *Test program has qualified the 320 kV direct current superconducting cable for currents up to 10 kA with a 3.2 GW power transmission capability.*

Paris La Défense, June 12, 2019 – Superconducting cables could enable Europe's power grids to meet their challenging CO_2 reduction targets by helping to transfer many gigawatts (GW) of electricity over distances of several hundreds of kilometers from remote solar or wind farms to population centers without the losses associated with traditional resistive cables. Nexans has helped to bring these innovative high power links a step closer to reality with the successful completion of qualification tests on the 'Best Paths' superconducting cable developed specifically for high-voltage direct current (HVDC) links.

There are already a number of superconducting cables operating in alternating current (AC) networks. However, the EU-funded Best Paths project has focused on the investigation of HVDC solutions for bulk power transmission with a modular design that is easily adaptable so that the rated current and voltage can be matched to any power grid specification. Nexans was the project leader, with nine other industrial and academic partners including CERN, Columbus Superconductors, ESPCI Paris, IASS Potsdam, Karlsruhe Institute of Technology (KIT), Ricerca sul Sistema Energetico (RSE), Réseau de Transport d'Électricité (RTE), Technische Universität Dresden and Universidad Politécnica de Madrid (UPM)

The Best Paths project culminated with the first-ever successful qualification on a test platform of a full-scale 320 kilovolt (kV) HVDC superconducting loop. This loop comprises two terminations and a 30 meter length of cable carrying a current of 10 kiloamps (kA) for a rated power transmission capacity of 3.2 GW. The program included a complete sequence of voltage testing at 1.85 time the rated voltage (up to 592 kV) and impulse tests.

The Best Paths cable is based on magnesium diboride (MgB2), a simple compound based on raw materials that are abundant in nature. The compound is easy and inexpensive to manufacture – providing a cost benefit compared to other relevant superconductor materials with the need to cool at a lower temperature. The cable is housed in a thermally insulating cryostat cooled by helium gas.

The main advantage of superconducting cables in HVDC applications is their capability to carry high currents so that they can transfer very large amounts of power with minimal losses. This high power capacity results in a very compact installation footprint in the range of one meter in width for a dipole carrying 6.4 GW. In contrast, a traditional circuit based on XLPE insulated copper cables would typically be 10 meters wide. This footprint reduction provides significant cost savings as well as making it easier to obtain permits for rights-of-way.

"Participation in the Best Paths project has further reinforced Nexans' leading position in superconducting cable technology and the new HVDC cable system is an important addition to our portfolio of technical solutions to increase the integration of renewable energy resources in Europe's power grids," says **Dr. Christian-Eric Bruzek, Project Manager at Nexans**. "*In the longer term we expect HVDC superconductor cables to carry power over hundreds of kilometers. But in the short term we see them as part of an overall solution alongside*

conventional overhead lines and underground cables, helping to create corridors in challenging installations such as when crossing rivers, in congested urban areas or where environmental impact must be minimized."

While the Best Paths project has focused on HVDC applications, the same cable technology could be employed in AC applications up Extra High Voltage levels of 400 kV.

Development and testing of the Best Paths cable involved Nexans facilities in Calais(France), Cortaillod (Switzerland), Halden (Norway) and Hannover (Germany).

About Nexans

Nexans brings energy to life through an extensive range of advanced cabling systems, solutions and innovative services.

For over 120 years, Nexans has been providing customers with cutting-edge cabling infrastructure for power and data transmission. Today, beyond cables, the Group advises customers and designs solutions and services that maximize performance and efficiency of their projects in four main business areas: Building & Territories (including utilities, e-mobility), High Voltage & Projects (covering offshore wind farms, submarine interconnections, land high voltage), Telecom & Data (covering data transmission, telecom networks, hyperscale data centers, LAN), and Industry & Solutions (including renewables, transportation, Oil & Gas, automation, and others).

Corporate Social Responsibility is a guiding principle of Nexans' business activities and internal practices. In 2013 Nexans became the first cable provider to create a Foundation supporting sustainable initiatives bringing access to energy to disadvantaged communities worldwide. The Group's commitment to developing ethical, sustainable and high-quality cables also drives its active involvement within leading industry associations, including Europacable, the NEMA, ICF or CIGRE to mention a few.

Nexans employs nearly 27,000 people with industrial footprint in 34 countries and commercial activities worldwide. In 2018, the Group generated 6.5 billion euros in sales.

Nexans is listed on Euronext Paris, compartment A.

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