Press release

Nexans goes live on grid with world's first fault current limiter based on second-generation superconductors

Following successful completion of long-term tests on a first generation SFCL at Vattenfall's Boxberg plant in Germany, Nexans has returned to install a new second-generation device based on superconductor tapes

Paris, January 13, 2012 – Nexans, a worldwide leading expert in the cable industry, has successfully commissioned the world's first resistive superconducting fault current limiter (SFCL) based on second-generation superconductor tapes. The SFCL, equipped with superconducting elements developed in cooperation with the Karlsruhe Institute of Technology, has been installed on behalf of Vattenfall Europe Generation AG to provide short-circuit protection for the internal medium voltage power supply that feeds coal mills and crushers in the Boxberg lignite power plant in Saxony, Germany.

A first generation SCFL, based on solid superconducting materials, was installed by Nexans at Boxberg in 2009 as part of a long-term test programme. Following the successful completion of this project, Nexans has returned to the plant for live testing of a new SCFL device featuring superconducting tapes. These tapes reduce the already low losses in the conductor material by around 90 percent, thereby lowering operating costs. They also provide an even faster response to a short circuit than the first generation materials.

"We now have a second superconductor material option for manufacturing power systems, and this will provide us with an even wider range of applications for our fault current limiters to help customers improve the safety of personnel and equipment while also reducing infrastructure costs. The upgrading and expansion of power networks to meet the fast-changing needs of our customers requires intelligent solutions and new functions," explains Jean-Maxime Saugrain, Corporate Vice President Technical at Nexans. *"The power plant's house load is just one of many potential applications for SCFL technology. For example, in the renewable energy sector the capability to supply more power from renewable sources is frequently restricted by the level of the short circuit currents."*

Fast response to short-circuit currents

The current limiter works in a similar way to the low voltage safety cut-out in domestic homes, but operates on the medium/high voltage network. In addition, after operating, it does not interrupt the electricity flow completely. Under normal circumstances, its superconducting elements allow the electricity to flow unhindered and with practically no resistance. If a critical current level is exceeded, such as during a short circuit, the conductor drops out from its superconducting state within milliseconds to act as a strong electrical resistor. Only a precisely defined residual current will then flow. This enables the

device to protect all the downstream components, such as switchgear, from the damaging overloading of a short circuit.

A key advantage of the SCL is its inherent safety, as it responds to a short circuit without an external trigger signal. Unlike pyrotechnic devices that need to be replaced after triggering, it can resume normal operation as soon as the short circuit fault is cleared and the material is able to return to its superconducting state.

The new SCFL is designed for a nominal current of 560 A at 12,000 V, but can also allow currents of up to 2,700 A to pass briefly without triggering the device. This is an important pre-requisite for operation so that the coal mills can draw a high current on start-up without experiencing any problems.

Coated conductors provide the core elements of the limiter

The new current limiter is based on superconducting tapes made of YBCO (yttrium barium copper oxide) also known as coated conductors. At temperatures lower than -180°C the thin ceramic layer becomes superconducting and can conduct electricity approximately 10,000 times better than copper.

The current limiting components based on second-generation superconducting tapes were developed over the past two years as part of the ENSYSTROB project. The project partners are Nexans SuperConductors GmbH, the Karlsruhe Institute of Technology, the Cottbus and Dortmund Universities of Technology and the energy group Vattenfall. The German Federal Ministry of Economics and Technology provided the project with financial backing of about €1.3 million.

About Nexans

With energy as the basis of its development, Nexans, worldwide leading expert in the cable industry, offers an extensive range of cables and cabling systems. The Group is a global player in the infrastructure, industry, building and Local Area Network markets. Nexans addresses a series of market segments: from energy, transport and telecom networks to shipbuilding, oil and gas, nuclear power, automotives, electronics, aeronautics, material handling and automation. Nexans is a responsible industrial company that regards sustainable development as integral to its global and operational strategy. Continuous innovation in products, solutions and services, employee development and engagement, and the introduction of safe industrial processes with limited environmental impact are among the key initiatives that place Nexans at the core of a sustainable future. With an industrial presence in 40 countries and commercial activities worldwide, Nexans employs 23,700 people and had sales in 2010 of more than 6 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.
For more information, please consult www.nexans.com or http://www.nexans.mobi

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