From: Manon Davies, Cardiff University <DaviesM75@Cardiff.ac.uk>
Sent: 30 July 2020 17:45
Subject: Research into insulators, converters & circuit breakers

InnoDC's researchers have recently published papers which look at ways to cut costs, increase efficiency and improve performance in energy technology.

Performance of Composite Outdoor Insulator under Superimposed Direct and Switching Impulse Voltages published in IEEE Transactions on Power Delivery.

Sometimes an overhead line's outdoor insulator can fail. Davide Pinzan, of Cardiff University, provides a test to assess insulator performance under various conditions, such as dry weather and rainy industrial areas. His paper includes results from experiments performed at University of Porto's High Voltage laboratory who hosted Davide on secondment last year. Click here to read a more detailed explanation and to watch his PowerPoint presentation to Cardiff University's High Voltage Group.
Paper authors: Davide Pinzan, Fábio Branco, Manu Haddad, Mohammed El Amine Slama, Maurizio Albano, Ronald T Waters and Helder Leite.

Photo source: Siemens.

Interaction Assessment and Stability Analysis of the MMC-Based VSC-HVDC Link published in Energies.

A modular multilevel converter, known as an MMC, is used to convert electric power from high-voltage alternating currents to high-voltage direct currents, or vice versa. Although this converter offers several advantages, such as lower losses and higher reliability, it requires a complex control system to work well. Saman Dadjo Tavakoli of UPC looks at the control design techniques that improve MMC performance and stability.

Paper authors: Saman Dadjo Tavakoli, Eduardo Prieto-Araujo, Enric Sánchez-Sánchez and Oriol Gomis-Bellmunt.

Photo source: Tsinghua University.

Operation and Control of an HVDC Circuit Breaker with Current Flow Control Capability published in IEEE Journal of Emerging and Selected Topics in Power Electronics.

In direct current (DC) systems, circuit breakers are used to help isolate DC faults. And current flow controllers are used to balance the currents that flow along transmission lines. But these separate devices are expensive. One way to cut costs is to integrate current controllers into circuit breakers. Wei Liu, of Cardiff University, presents a new device, combining the breakers and controllers, thereby simplifying the system and reducing cost.

Paper authors: Wei Liu, Chuanyue Li, Carlos Ugalde Loo, Sheng Wang, Gen Li and Jun Liang.

Read more InnoDC research publications here.

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