

B4 - DC systems and power electronics



Mission

To facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of Direct Current (DC) equipment/systems and power electronics applications. To add value to this information and knowledge by means of synthesizing state-of-the-art practices and developing recommendations.

Technological field of activity

- > Direct Current equipment and systems including converter technologies and semi-conductor devices.
- > Power electronics for AC systems and power quality improvement, advanced power electronics and applications.

Scope

Within its technical field of activity, [Study Committee B4](#) SC B4 addresses DC systems and Power Electronics (PE) equipment in both transmission and distribution systems. The study committee also addresses DC Converters for the integration of distributed renewable (PVs) and energy storage as well as power quality control. SC B4 covers the full spectrum of DC systems and PE devices including technology, specification, design, implementation, operation, maintenance, refurbishment of DC systems and FACTS devices.

Within this framework additional specific areas of attention include:

- > Theory, technologies, design, performance, operation & maintenance, and application of DC converters and systems;
- > Theory, technologies, design, performance, operation & maintenance, and application of FACTS devices;
- > DC interconnectors and establishment of DC grid(s)/multi-terminal HVDC systems to increase power transmission capacities and to reduce existing network congestions (AC network overlay), to enable power trading, to share spinning reserve, and to reduce energy costs;
- > Technologies of inverters with Grid-Forming control capabilities to improve and enhance the reliability and stability of the PE dominated power system with integration of growing renewable generations and battery storage resources;
- > Standardization and digitalization of Offshore DC platforms;
- > Implementation of Interoperability of HVDC systems constructed by various HVDC OEMs for flexible and reliable operation and control of largely interconnected power system through HVDC system;
- > Application of DC technologies and PE in distribution system for better power quality control;
- > MVDC applications such as connection of large solar parks;
- > Refurbish and upgrade of HVDC systems and FACTS devices;

> Inverter based Energy storage.

Keywords

HVDC, MVDC, LVDC, LCC, VSC, FACTS, Power Electronics, AC/DC and DC/DC converters, AC/AC Power Electronics based transformers, Grid forming/following converters, DC breakers, Hybrid HVDC, DC Grid, Multi-terminal HVDC, Inverters for Wind/PV/Storage, Interoperability, HVDC/FACTS/Other PE devices Modelling, Reliability/Availability/Maintainability (RAM)

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