Technical Brochures

Technical Brochures: an output of CIGRE's 16 Study Committees and their 250+ Working Groups

Technical Brochures (TBs) are globally diverse, comprehensive publications. 970+ have been published to date, with around 40 new ones added each year.

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Technical Brochures cover the full spectrum of the end to end power system and are factually robust, each offers over 100 pages of in-depth technical expertise.

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Technical Brochures are the output of CIGRE's 16 Study Committees and their 250+ Working Groups. These Working Groups are made up from a diverse collection of technical experts from across the global CIGRE community.

Technical Brochures undergo a rigorous peer review process to ensure their accuracy and integrity. They represent unique tools for real world application and standardisation of methods.

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This comprehensive report addresses the urgent need for updated education, training, and professional development in the face of rapid technological change and the global energy transition.

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TB976 Methods for Identification of Frequency Response Characteristic of Voltage Measurement Systems

The Technical Brochure deals with the technology of voltage measurement systems, which are covered by the standard family IEC 61869

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The integration of offshore wind power into the onshore grids comes with both opportunities and challenges, requiring a coordinated approach across multiple stakeholders.

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TB970 The Potential Roles of Energy Storage in Power Systems

Successfully decarbonising the electric power system requires greater flexibility. Most grid operators agree that storage technologies that do not emit CO2 when used will play a crucial role within their networks in the years to come.

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TB961 Interoperability in HVDC systems based on partially open software

Interoperability in HVDC systems could be supported with open upper-level control and protection (C&P) software, while hardware-near C&P functions stay black-boxed and proprietary.

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TB960 Certification of the electricity used to produce hydrogen

This TB offers an exhaustive examination of hydrogen certification schemes globally. Initially, 34 certification schemes were mapped, and 13 of them were selected for detailed analysis based on 14 key technical parameters.

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TB954 Electric Vehicles as Distributed Energy Resource (DER) Systems.

The analysis of electric mobility grid integration has become vital nowadays due to its transformative role in the power and energy system.

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TB950 Hybrid LCC/VSC HVDC systems.

TB950 discusses comprehensively the definition and configuration of hybrid HVDC systems, as well as the necessary equipment, control, applications and prospects.

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TB946 The impact of the growing use of machine learning/artificial intelligence in the operation and control of power networks from an operational perspective

As the complexities of operating modern power systems increase, many stakeholders throughout the energy value chain are turning to machine learning (ML) and artificial intelligence (AI) to manage these challenges.

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TB942 Role of Hydrogen in energy transition opportunities and challenges from technical and economic perspectives.

This Technical Brochure is intended as the first one on the broad topic of hydrogen; it tries to be quite comprehensive to constitute a foundation for a new important thread in CIGRE, and will be followed by further work, both within SC C1 and other SCs.

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TB938 Global Interconnected and sustainable electricity system - effects of storage, demand response and trading

rules.

This unique Technical Brochure illustrates how CIGRE can conduct global studies involving all continents and regions.

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TB936 Enhanced Information and Data Exchange to Enable Future TSO-DSO Coordination and Interoperability.

Enhanced Information systems and data exchange is now essential to enable the required levels of future transmission and distribution system interoperability, interaction and coordination. Find extensive expertise on this key subject.

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TB935 Feasibility study and application of electric energy storage systems embedded in HVDC and STATCOM systems.

This invaluable Technical Brochure provides insights on converter topologies, modelling, integration options, ancillary services, benefits, and challenges of energy storage integration in HVDC/STATCOM systems.

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TB934 Interaction between nearby VSCHVDC converters, FACTs devices, HV power electronic devices and conventional AC equipment.

With over 100 pages of expert reference information this in-depth Technical Brochure provides recommendations on analysis, modelling, and mitigation of interactions between VSC-HVDC converters or passive HV devices.

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TB932 Aggregation of Battery Energy Storage and Distributed Energy Resources.

This TB describes distributed BESS aggregation approaches, BESS operating constraints in terms of battery technology, weight, maintenance, and coordination with other controllers and much more.

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TB931 Technical requirements and field experiences with MV DC switching equipment.

This TB describes potential use cases and applications of MVDC in networks. Focus is given on projects with switching equipment involved and on the different switching equipment for DC networks.

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TB923 Optimal transmission and distribution investment decisions under increasing energy scenario uncertainty.

This TB investigates the integration of uncertainties into planning scenarios, focusing on the decision-making processes of Independent System Operators (ISOs), Transmission System Operators (TSOs), and Distribution System Operators (DSOs).

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TB914 Guidelines for SF6 end-of-life treatment of T&D equipment (>1 kV) in substations

This TB summarises the practices and informs the EoL procedure of handling electrical equipment containing SF6 and the SF6 itself. Every step of the process is explained in detail.

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TB911 Power system restoration accounting for a rapidly changing power system and generation mix

This TB looks at the utilisation of new and emerging technologies during system restoration. To enable system operators to continue executing a successful system restart in a rapidly changing generation mix.

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TB897 Carbon Pricing in Wholesale Electricity Markets

This Technical Brochure examines the results of a survey on carbon pricing and wholesale electricity markets developed by CIGRE Working Group C5.32.

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TB882 Closing the gap in understanding between stakeholders and electrical energy specialists

This TB is aimed at reducing the gap in understanding between energy personnel and their stakeholders. It draws on a selection of twenty case studies and provides a range of tools and examples.

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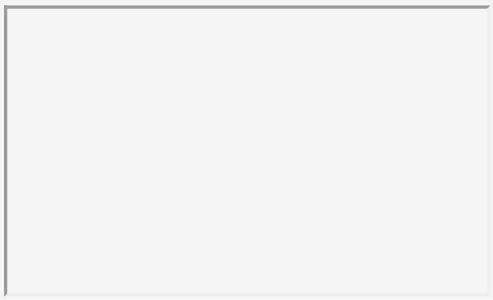

TB875 Medium Voltage DC Distribution systems

Embedded as part of distribution grids, MVDC systems are expected to facilitate a growing number of distributed renewable energy sources, which require power electronics interfaces, learn about this and much more in this in-depth publication.

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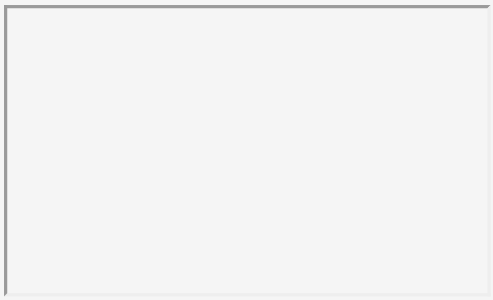

TB 874 Auction Markets and Other Procurement Mechanisms for Demand Response Services

Ensuring balance between generation and demand is challenging in power systems due to sudden load changes, forecasting errors and renewables. This in-depth TB explores the challenges and solutions you need.

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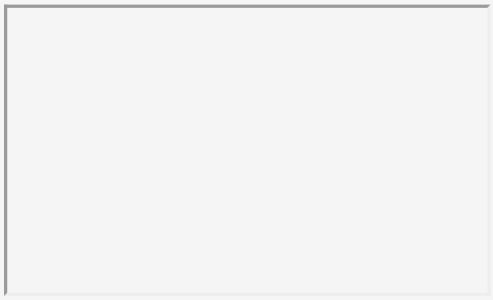

TB 851 Impact of high penetration of inverter-based generation on system inertia of networks

The worldwide drive to reduce carbon emissions has led to a global effort to accelerate the development and deployment of renewable energy sources. This TB explores key issues around inverter based generation and the impact on system inertia.

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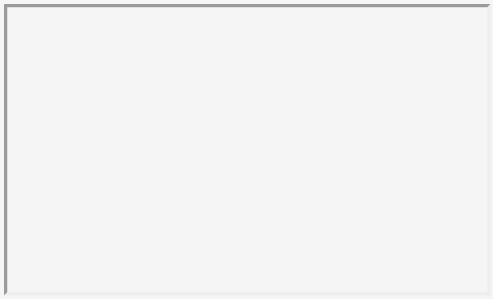

TB823 Substation servicing and supervision using mobile devices and smart sensing

The Technical Brochure analyses the way substation servicing and supervision is and will increasingly benefit from the use of smart and wireless sensing technologies and smart and wearable mobile devices.

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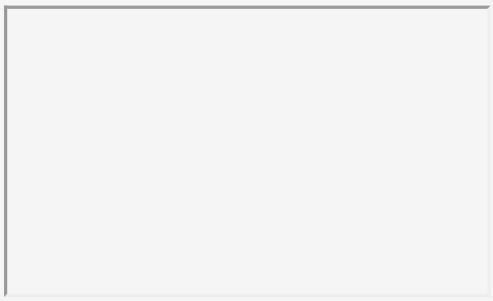

TB820 Optimal power system planning under growing uncertainty

This TB investigates the uncertainty factors existing in the power systems around the world and how they are considered in system planning. Best practices and lessons learned in planning under growing uncertainty are introduced.

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TB807 Application of robotics in substations

This TB provides an overview of the existing applications of robotics in substations for construction, inspection, maintenance, and operation. It also presents the current and expected future trends in the development of new robot systems, pointing to the need for further research and standardization.

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