



Study Committee B3 - Substations

STRATEGIC PLAN 2013 – 2018

of CIGRE Study Committee B3: "Substations"

(Revision 16 April 2013, renamed July 2014)

1. Introduction

1.1 Purpose of the Strategic Plan

The Strategic Plan defines the longer term objectives and ambitions of CIGRE Study Committee B3 Substations (SC B3). This plan outlines how SC B3 will address the technical and administrative challenges facing the CIGRE community with regard to substations.

1.2 Mission of SC B3

SC B3 aims to facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of substations. SC B3 acts to add value to this information and knowledge by means of synthesizing state-of-the-art practices, developing recommendations and providing best practice.

1.3 Scope of activities

The activities cover the design, construction, maintenance and ongoing management of substations and the electrical installation in power stations excluding generators. SC B3 serves a wide range of target groups in the Electric Power Industry whose needs include the technical, economic, environmental and social aspects in varying degrees.

Major objectives include increased reliability and availability, cost effective engineering solutions, managed environmental impact, effective asset management and the adoption of appropriate technological advances in equipment and systems to achieve these objectives.

1.4 Organisation of work

SC B3 constitutes a bridge between the "system" study committees (the C-committees) and the more specialised "equipment" committees (the A-committees) and has working relationships with most of the other study committees.

SC B3 is structured in Working Groups and Advisory Areas. The purpose of Advisory Areas being to coordinate and align working group activities to the SC B3 Strategy.

2. Challenges of the operational environment

Transmission and Distribution substations play a central role in providing reliable energy with high availability. High voltage power transmission research & development continues to make advances in new technologies and applications that give transmission and distribution owners and operators the flexibility, security and stability they need to continue to expand their systems reliably and efficiently. As the electric power infrastructure expands and global demand for power



Study Committee B3 - Substations

grows, suppliers and customers alike will **need** to cooperate to ensure that the appropriate technologies are developed and deployed in a sustainable manner. At the same time the sector will **be required** to maintain the availability of the energy delivery system, provide dependable and affordable sources of electricity, and ensure the highest standards of public welfare and safety.

The challenges mentioned above have resulted in a number of new initiatives including:

- New optimised substation concepts;
- Increased substation functionality (primary, secondary, auxiliaries);
- New concepts for substation operation and maintenance;
- New improvements for existing substations (retrofit, uprating, upgrading, renewal **and extensions**);
- Increased substation operational efficiency **and availability**;
- Increased environmental compatibility and reduced emissions;
- Design adaptation of secondary systems.

These solutions are aimed to include the needs of developing and emerging economies as well as those of the industrialized countries.

3. Customers of Study Committee B3

The following Target Groups are considered the key customers or stakeholders of SC B3:

1. Executive Management (especially of SC B3 member organisations).
2. Commercial Group: Financial Institutions, Owners, Investors, Regulators, Energy Traders, Power Generators, Distributors.
3. Technical Group: Equipment Suppliers, Contractors, Consultants, Maintenance Providers, Grid Planners, Grid Engineers.
4. Operators **and Developers** of Power Systems (Generation, Transmission, Distribution), Utilities, Asset / Facility Managers.
5. Science, Education and Public Group: Universities, Research Institutes, Young Engineers, Managers and Others (who are not familiar with CIGRÉ SC B3 work), Authorities, Media, NGOs.
6. International Organisations with similar Scope such as CIREN, Eurelectric, IEC, IEEE, IEE, T&D Europe etc.
7. CIGRÉ Internal: Technical Committee, Other Study Committees, National Committees, Ordinary Members, **Young members** etc.

4. Objectives and Strategy

4.1 Ambitions and objectives

Within its field of activity SC B3 aims to:



Study Committee B3 - Substations

- serve the needs of its Target Groups by means of:
 - being aware of their needs;
 - monitoring and reporting on international developments;
 - promoting trends beneficial to its Target Groups
 - issuing guidelines and recommendations
- promote and recommend innovative solutions and concepts considering all relevant factors (economical, technical, environmental, social and others);
- see the substation as an integral part of the network and ensure overall optimised system;
- **provide** solutions **incorporating** active co-operation with both systems oriented and equipment study committees of CIGRE;
- be aware of the needs of the developing and emerging economies, actively working to address them and involve representatives from these countries in its work;
- actively promote and support international co-operation;
- develop reciprocal exchange with other international bodies with similar scope (e.g. IEEE, CIRED) to strengthen links and avoid duplication

4.2 Strategic technical directions

The direction of present and future technical activities of the study committee should address:

- T1. **New substation concepts and materials:** Development of new concepts including bus arrangements, hybrid solutions, new applications, **integration of new materials** and functions including specification of corresponding design/layout criteria for substations constituting integral parts of totally optimised networks.
- T2. **Substation management issues:** Organisational aspects including human resource and training needs, in-service support, software management including quality control and maintenance. Asset management including **safety, security, environmental**, technical, financial and regulatory requirements.
- T3. **Life cycle management and maintenance:** Monitoring in-service experience including digital and sophisticated measuring equipment, substation condition assessment, aspects of maintenance **and maintainability**, outsourcing, short-and long-term needs, opportunities for cost reduction, spare parts. Increased utilisation (life extension, upgrading, dynamic loading), **replacement**, refurbishment /renovation concepts, investment strategies, principles for combining existing and new equipment - taking into account specific demands from network-reliability and customer demand-side points of view.
- T4. **Impact of new communication standards and Smart Grids on existing and new substations:** New technologies to be used in substations, impact of distributed generation and power flow control systems, increased use of advanced information and communication technologies under HV conditions.

The work performed in the Working Groups should result in publications defining, best practice or guidelines addressing where appropriate, specification, installation, commissioning, operation, maintenance, life-cycle and ongoing management of substations and their subsystems.



Study Committee B3 - Substations

4.3. Strategic administrative directions

In order to adequately address the technical directions, SC B3 will also adopt the following administrative strategy:

A1. **Organisation of work:** The organisation of the Study Committee and its way of working will be adapted **and streamlined for** the changing environment, to give increased flexibility and short response time, including **encouraging and promoting** the ongoing recruitment of new engineers.

A2. **Co-operation with others:** Develop co-operation with other international organisations in the field of substations.

A3. **Enhanced Communication:**

A 3.1 **Increased international profile:** Regular publications and contributions to CIGRE Symposia, Paris Sessions **and Electra**. Strengthen cooperation with CIGRE Regions (presentations during regional conferences); organisation of Colloquia and tutorials in conjunction with Study Committee meetings; organisation of workshops and tutorials in conjunction with WG-meetings; **selection of venues to maximise the benefit and international profile of CIGRE and SC B3**.

A 3.2 **Improved Internal and external communication:** Improve communication with customers, CIGRE members, non-members and other potential "customers", **including Distribution customers**. Improve feedback from the Target Groups and develop communication with decision makers. **Maximise and develop use of the SC B3 web site**.

A 3.3 **Development of Tutorials:** Tutorials will be organised in conjunction with Colloquia, Symposia or other CIGRE events with SC B3 involvement. The content will normally be based on the current or recent activities of Working Groups / Task Forces. Their purpose is to educate / train a range of target audiences (students and young engineers, engineers and managers in the electrical power sector).

A3.4 **Increased use of new communication technologies:** Meetings, sessions, symposia and other SC B3 events will be arranged to maximise the use of new technologies including web based technologies, "social media", short message service and other technologies to maximise participation of all target groups.

A3.5 **Development of Reference Books:** A focus for the remainder of the strategic planning period will be the development of "Green Books" in the study area of Substations and on the topic of SF₆ to facilitate the availability of information and to identify new areas of study.

A4. Enhancement of the business value of CIGRE member involvement: Enhancing and demonstrating the value of membership and participation in CIGRE activities by members and experts in business terms. This will be achieved by focusing efforts to maximise benefits and assisting members and experts to negotiate with management on the strategic and business value of CIGRE involvement.