

industry reports

CIGRE B5 Protection and Automation



B5 is one of 16 Study committees of CIGRE. Its scope is to facilitate and promote the progress of engineering and international exchange of information in the field of PAC.

CIGRE (INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS) is one of the leading worldwide organizations on electric power systems. CIGRE is a permanent non-governmental and non profit-making international association based in France. It is concerned with technical, economic, environmental, organizational and regulatory aspects of power systems. It was founded in 1921 and aims to: Facilitate and develop the exchange of engineering knowledge and information, between engineering personnel and technical specialists in all countries as regards generation and high voltage transmission of electricity.

- Add value to the knowledge and information exchanged by synthesizing state-of-the-art and world practices.
- Make managers, decision-makers and regulators aware of the synthesis of CIGRE's work, in the area of electric power.

At the core of CIGRE's mission are issues related to planning and operation of power systems, as well as design, construction, maintenance and disposal of HV equipment and plants. Problems related to power system protection, telecontrol, telecommunication equipment and information systems are also part of CIGRE's area of concern.

CIGRE has members in more than 80 countries and these are divided into two categories of members:

- Individual members in the engineering, teaching or research professions as well as of other professions involved in the industry (lawyers, economists, etc.).
- Collective members who consist of public or private companies, of industrial and/or commercial character, and scientific or technical organizations, research institutes, educational and administrative bodies.

CIGRE develops technical knowledge using two methods:

- Conferences and meetings, where papers are discussed;
- Permanent Study Committees (SCs) working on technical subjects and publishing reports.

The Biennial Session held in Paris every even numbered year is the most important CIGRE event. It brings together some 2500 delegates from all the parts of the world and nearly 400 papers, covering all the fields of CIGRE, are discussed.

Symposia are usually held in odd numbered years, in different countries: attendance is smaller and these events focus on a limited number of topics. Other meetings are held at a country or regional level. Within the CIGRE organization, sixteen SCs are currently active, each dealing with a specific technical field of the power industry. The SC work is carried out by working groups (WGs) and task forces (TFs), and coordinated by the Technical Committee of CIGRE. More than 1000 international experts are involved in these working bodies with approximately 50 reports being issued every year.

Of specific interest to PACWorld readers is SC B5 which deals with Protection and Automation.

SC B5's mission is to:

- Facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of protection and automation.
- Add value to this information

and knowledge by means of synthesizing state-of-the-art practices and developing recommendations.

SC B5's scope covers principles, design, applications, coordination, performance and asset management of:

- System protection
- Substation control and automation
- Remote control systems and equipment
- Metering systems and equipment

All technical, organizational and economic aspects are considered by SC B5 including staff education and training. Emphasis is placed on design and application of digital technology and modern integrated system approach including hardware and software for the acquisition of system state information and data communication control.

CIGRE SC B5 events and activities include attending the general session with all other SCs and general delegates in Paris every even year; and on uneven years attending B5 colloquiums that are centered around 3 preferential subjects; attending tutorial sessions, B5 SC meetings and poster sessions.

SC B5 WGs and TFs meet regularly and publish brochures / reports and articles for CIGRE's official monthly journal ELECTRA. SC B5 members also attend other regional CIGRE events and all chairmen attend the CIGRE Technical Committee meetings.

Recent publications include:

- How to use IEC 61850 in Protection and Automation, ELECTRA October 2005
- A survey of engineering tools for protective relaying, ELECTRA April 2006
- Relay Software Models for Use with Electromagnetic Transient Analysis Programs Brochure 295 / ELECTRA June 2006
- Remote On-line Management for Protection and Automation Brochure / ELECTRA October 2006

Further details can be obtained at <http://www.cigre.org/>

IEEE PES Power Systems Relaying

by Charlie Henville

A TECHNICAL COMMITTEE OF THE IEEE POWER ENGINEERING SOCIETY.

This committee is one of 18 technical committees of the IEEE Power Engineering Society (PES). The scope of the committee simply stated is to provide technical guidance and leadership in the technology of electric power system protection. More specifically, the scope reads as follows:

"Treatment of all matters in which the dominant factors are the application, design, construction and operation of protective, regulating, monitoring, reclosing, sync-check, synchronizing and auxiliary relays including matters necessary to the functioning of relays and relaying systems employed in transmission, generation, distribution and utilization of electrical energy and their effect on system operation. Maintenance of liaison and collaboration as required with other committees of PES and associated groups of IEEE."

Through the cooperative volunteer efforts of more than a hundred power system protection engineers,

the PSRC assists the protective relaying industry by providing leadership in all items related to its scope. The leadership is provided through the development of technical documents as follows:

- Standards, recommended practices or guides published through the IEEE Standards Association. These are formal documents that have been through the IEEE standards review process, and are used world wide as reference documents to standards or guide practices.
- Technical papers published through IEEE Transactions on Power Delivery or IEEE Transactions on Power Systems. These documents are retrievable from Transactions publications or through the IEEE technical publications services.
- Technical reports published through IEEE special publications IEEE conference proceedings or various regional conference proceedings or on the Committee "Publications" web page (see www.pes-psrc.org). These documents have been through the Committee or Subcommittee review process but are not part of the IEEE standards series. They provide information on various aspects of power system protection.
- In addition to the publications, the Committee also prepares and conducts industry surveys on various topics within its scope and publishes the results of such surveys.
- The Committee also prepares

and presents panel sessions and tutorials at various technical conferences and PES conferences as an educational service. To accomplish the task, the Committee is divided into several technical subcommittees with specific scopes. The names of the subcommittees are:

- Systems Protection Subcommittee
- Line Protection Subcommittee
- Relay Communications Subcommittee
- Relaying Practices Subcommittee
- Rotating Machinery Subcommittee
- Substation Protection Subcommittee.

The scopes of these subcommittees can be found on the subcommittee pages accessed through links on the main page of the website <http://pes-psrc.org/>. Each Subcommittee then manages several working groups and task forces with various assignments.

The scopes of the Main Committee and the Subcommittees and the assignments of the various task forces as well as the membership lists are published in the PSRC Directory each year. The Directory can be retrieved directly from the Website. Many working group and task force assignments are also updated and amplified on the individual web pages associated with those groups.

The Committee, the Subcommittees and most of the working groups and task forces meet three times per year in various

locations in North America. At these meetings the assignments are pursued, and new working groups are formed and ones that have completed their assignments are disbanded. The results of working group efforts are often given in presentations at these meetings.

Officers

The officers of the PSRC consist of the Chair, Vice Chair, Secretary/Treasurer and Standards Coordinator. Details of the administrative duties for the officers are detailed in the Operation and Procedures (O&P) manual available from the Committee website, but in general terms, they are as follows:

The Chair is responsible for the overall operation of the Committee, and liaison with the Technical Council of the PES.

The Vice Chair, in addition to acting for the Chair, is responsible for the technical programs sponsored by the PSRC at PES meetings such as the annual General Meeting and other special meetings.

The Secretary is responsible for meeting arrangements and agendas, plus assembly and publication of minutes of meetings. The Secretary also manages the Committee's financial affairs.

The Standards Coordinator is responsible for liaison between the PSRC and the entities it reports to such as the IEEE Standards Board and the PES. The Standards Coordinator also supports standards development activities within the PSRC.



This committee is one of 18 technical committees of the IEEE Power Engineering Society (PES). The scope of the committee simply stated is to provide technical guidance and leadership in the technology of electric power system protection.

The officers are supported by an Administrative Committee responsible for the various administrative activities such as membership, long range planning, bibliography, awards and recognition etc.

Each of the six subcommittees has a Subcommittee Chair and Vice chair who are responsible for the operation of their subcommittees. Primary operations are to manage and coordinate the activities of various working groups and task forces. The subcommittee Chair and Vice Chair, with the help of the subcommittee members are responsible for the creation of new working groups and the disbandment of those groups that have completed their assignments.

Meetings

The PSRC operates through a subcommittee, working group, and task force structure. The committee, subcommittees, working groups and task forces engage in face to face discussion, and to update each other on progress. Since PSRC activity participants live and work all over North America, these meetings offer opportunity for personal interaction that is an important component to support the committee operation and project completion. Most of the committee work is accomplished between meetings however, with communication by email, telephone and FAX.

Participation in working group activities by correspondence is possible, but it is difficult to participate as a subcommittee or main committee member without significant attendance at meetings. Committee and subcommittee members are encouraged to attend at least two out of the three meetings per year.

Presently there are six technical subcommittees with defined areas of interest/responsibility and an advisory subcommittee that deals with administrative matters.

The technical subcommittees are

continuously operating groups with scopes that encompass major areas of power system protection. These subcommittees form task forces and or working groups that usually have more focused assignments to complete specific tasks within specific time frames. At regular meetings, the working groups and task forces usually meet in the first 1 ½ days in multiple parallel sessions (up to 8 or 9 simultaneous sessions). On the afternoon of the second day, the subcommittees meet. There the working groups and task forces report on their progress and new groups are formed and old ones disbanded. Due to the larger perspectives of the subcommittees, only two subcommittees usually meet in parallel sessions.

On the morning of the third meeting day, the Main Committee meets and discusses matters of common interest. At the Main Committee meeting there may be one or more technical presentations. These presentations will usually present work that has been recently completed by working groups. Other presentations of interest may also be made.

Visitors do not have to be members of working groups or subcommittees in order to participate in discussions. Most meetings are open to all, and visitors are encouraged to share their thoughts and questions to give as broad a perspective as possible on the work being accomplished.

Recent Activities

In the year 2006, the Committee has sponsored the development of ten new or revised IEEE standards or guides in the field of protective relaying. In addition it has published four technical reports that are freely available at its website.

The reports published in 2006 are:

- Considerations for Use of Disturbance Recorders
- Protective Relaying and Power Quality

- Loss of ac Voltage Considerations for Line Protection
- Manufacturer's Service Letter Database

It has published and sponsored numerous technical papers at industry conferences and has received several merit awards including the PES Outstanding Working Group award five times in the last ten years.

Engineers interested in power system protection are encouraged to visit the Committee website, and browse through all the activity reports. In particular, look at the annual directory (click on the link to "PSRC Directory") to get an overview of current activities. Usually there are more than 50 active working groups or task forces at any given time. Relay engineers are encouraged to browse and use the output of this committee, and also to consider participating in its work. Some reasons why you as an engineer working in the field of power system protection might wish to participate in the Committee activities include:

- Highlight your company's best practices
- Learn about and influence standards that directly affect your business
- Gain advanced knowledge on future standards and guides
- Share best practices with utilities, consultants and suppliers
- Become aware of solutions and new/different protection practices
- Gain knowledge with interaction from Industry leaders
- Acquire highest level, inexpensive training
- Receive any Guide, Standard, Transaction or Report that you help develop as a member of the applicable Working Group

For further information, contact any of the officers or subcommittee or working group chairs listed in the Directory. Names and mailing addresses are provided in the directory.