

**CIGRE Study Committee B5 (Protection and Automation)**  
**Report to CIGRE UK 2011**

Chairman	- Javier Amantegui (Spain)
Secretary	- Iony Patriota de Siqueira (Brazil)
UK regular member	- Richard Adams

**Mission**

To facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of protection and automation. To add value to this information and knowledge by means of synthesizing state-of-the-art practices and developing recommendations.

**Scope**

Study Committee B5 covers principles, design, applications, co-ordination, performance and asset management of:

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

All technical, organisational and economical aspects are considered 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, local and remote data communication, and execution of control commands.

**Colloquium 2011**

The 2011 colloquium was held 12 – 17<sup>th</sup> September in Lausanne, Switzerland. Unfortunately this was the same week as the CIGRE Symposium in Bologna and an IEEE PSRC meeting. The week included a poster session and small technical exhibition. On the Saturday immediately after the colloquium a technical tour to CERN was included.

There were three preferential subjects as follows:

- IEC 61850: Which Tools for Whom
  - Special Reporter – Anders Johnsson (SE)
- Protection of Hybrid Line/Cable Circuits
  - Special Reporter – Luc Uyttersprot (BE)
- Performance of Protection Systems under Stressed Conditions
  - Special Reporter – Raul Sollero (BR)

A tutorial entitled “IEC 61850 – Moving towards Edition 2” was presented.

## **Committee Meeting 2011**

The committee meeting was held on Friday 16<sup>th</sup> September and attended by around 41 regular members, observers, convenors and guests. SC B5 has 25 members and 16 observers.

Javier Amantegui announced during one of the evening events at the colloquium that the new SC chairman from 2012 will be Iony Patriota de Siqueira (Brazil). Iony announced that the secretary will be Rannveig Løken (Finland).

Klaus Peter Brand will replace Ivan De Mesmaeker, who is stepping down as convenor for the Tutorial Advisory Group.

SC B5 published 7 technical brochures in the last year.

The 2013 colloquium will be held in Belo Horizonte, Brazil and a short presentation was given. It will be held in conjunction with SIMPASE, a biannual event held by the Brazilian National Committee, involving B5, C2 (Operations) and D2 (Communication)

On the basis that 4 working groups have completed their work in the last year or are about to complete, 4 new working groups are to be created as follows:

### **Application and management of cyber security measures for P&C systems**

(Convenor – Denis Holstein (US))

### **Protection & Automation of Shunt Capacitors**

(Convenor – TBA (possibly CA))

### **The development of relevant WTG (Wind Turbine Generator) / WPFS (Wind Power Farms Stations) models to assess the impact on grid short circuit currents level and on grid protection systems.**

(Convenor – TBA)

### **Network Protection Performance Audits**

(Convenor – Peter Watson (UK))

Nominations for UK members for all of the above are being sought.

## **Paris Session 2012**

The special reporters for the Paris 2012 Session have been chosen and the two preferential subjects are:

- PS1 - Impact of Future Network Components on coordination of Protection and Automation Systems
  - Rod Hughes (Australia)
- PS2 - Requirements, specification and organisation of secure cyber access
  - Mladen Kezunovic (USA)

There are 3 UK based papers, all for PS1:

- Performance verification and scheme validation of adaptive protection schemes
- Performance assessment of IEC 61850-9-2 based protection scheme for a 400kV transmission system mesh corner
- Smart Algorithms to accommodate distributed generation in the grid

### **UK Liaison Meeting**

A UK liaison meeting was held on 21<sup>st</sup> July in the Council Chambers at University of Manchester and was attended by 22 people. The date of the next meeting is to be decided (first half of 2011) and the venue may be National Grid Control Centre.

### **General**

An update of CIGRE SC B5 activities was presented at the IET Power System Protection seminar on 30th September at Austin Court in Birmingham.

Richard Adams' term as UK member for SC B5 will end in Paris 2012. John Fitch of National Grid has expressed an interest in taking over this role.

## **Working Group Activities**

### **WG B5.04 Modern Techniques for Protecting and Monitoring of Generating Plant**

Convenor - G Benmouyal (CA)

UK member - A Yip (regular)

Published October 2011, Technical Brochure 479.

### **WG B5.05 Modern techniques for P&C of power transformers**

Convenor - M Sachdev (CA)

UK member - RK Aggarwal (corresponding)

Published June 2011, Technical Brochure 463.

### **WG B5.06 - Maintenance Strategies for Digital Substation Automation Systems**

Convenor – V Leitloff (FR)

UK member – J Wright (regular)

Published June 2011, Technical Brochure 464.

### **WG B5.07 Techniques for Protecting and Monitoring Transmission Lines**

Convenor - S Chano (CA)

UK member - G Baber (regular)

Published June 2011, Technical Brochure 465.

### **WG B5.08 Refurbishment strategies based on Life Cycle Cost, Operational Risks and Technical Constraints**

Convenor - P Leushuis (NL)

UK member - J Wright (regular)

Published February 2011, Technical Brochure 448.

### **WG B5.12 - Engineering Guidelines for IEC 61850 Based Digital Substation Automation Systems**

Convenor – J Castellanos (ES)

UK members - P Beaumont (regular), D Webb & C McTaggart (both corresponding)

Published June 2011, Technical Brochure 466.

### **WG B5.14 - Wide Area Protection & Control Technologies**

Convenor – V Terzija (UK)

UK members – M Osbourne (regular) & RJ Adams (corresponding)

Expected to complete early 2012.

### **WG B5.23 - Short circuit protection of circuits with mixed conductor technologies in transmission networks**

Convenor – Luc Uyttersprot (BE)

UK member – Glenn Elworthy (corresponding)

Chapters have been drafted and draft report is almost ready.

### **WG B5.24 - Protection Requirements on Transient Response of Voltage and Current Digital Acquisition Chain**

Convenor – Janez Zakonjsek (RU)

UK members – Ray Zhang (regular) & Daniel Otto & Vladimir Terzija (both corresponding)

First draft expected January 2012, with publication late 2012.

**WG B5/B4.25 - Impact of HVDC Stations on Protection of AC Systems**  
**This is a joint WG with SC B4 (HVDC and Power Electronics), but led by SC B5.**

Convenor – Xi-cai Zhao (CH)

UK Members – Ryan Tumilty & Paul Bancroft (both corresponding)

Work complete and ready for publishing. Recommendation for new WG to cover VSC/light HVDC.

**WG B5.27 - Implications and Benefits of Standardised Protection Schemes**

Convenor – Alex Apostolov (US)

UK members - Ray Zhang (regular)

Draft (approx 120 pages) completed. Expected to complete 2012.

**WG B5/D2.30 Communications for HV Substation Protection & Wide Area Applications (synchronised phasors)**

Convener – Mehrdad Mesbah (FR)

UK members – John Wright (regular) & David Meadows (corresponding)

UK Mirror WG members - John Newbury, Wen An, Vladimir Terzija, Steve Potts, Alastair Adamson, & Mark Stockton

Final draft expected by December 2011.

**WG B5.31 Management of Protection Relay Settings**

Convenor – Peter Crossley (UK)

UK members – John Fitch (regular) & Pelqim Spahiu & D Keeling (corresponding)

Report is almost complete and anticipated to complete by the end of the year.

Powerpoint tutorial and Electra article also drafted.

**WG B5.36 Applications for Protection Schemes based on IEC 61850**

Convenor – D Tholomier (FR)

UK members – R Tumilty & A Darby (both regular)

Draft report prepared, progress has slowed.

**WG B5.37 Protection, Control & Monitoring of Shunt Reactors**

Convenor – S Roxenborg (SE)

UK member – L Lei Lai (corresponding)

First draft almost complete. Expected to complete 2012.

**WG B5.39 Documentation requirements from design to operation to maintenance for Digital Substation Automation Systems**

Convenor – Rodney Hughes (AU)

UK member – Haiyu Li

Survey carried out and structure drafted.

**WG B5.40 Education, Qualification and Continuing Professional Development of Engineers in Protection and Control**

Convenor – Mladen Kezunovic (US)

UK members – P Crossley and P Watson (both regular)

Outline drafted, report 60% complete. Expected to complete early 2013.

**WG B5.41 Investigation of possibilities to improve metering systems for billing purposes in substations**

Convenor – R Burgers (IE)

UK member – Keith Campion (regular)

The new convenor is trying to get work restarted.

**WG B5.42 Experience concerning availability and reliability of (DSAS)**

Convenor – Massimo Petrini (IT)

UK member – A Darby (regular) & Li Yang (corresponding)

UK Mirror WG members – J Wright & D Meadows

A questionnaire is being drafted. Completion expected in 2013.

**WG B5.43 Co-ordination of Protection and Control for Future Networks**

Convenor – Mark Adamiak (US)

UK members – S Subramanian (regular) & A Khan (corresponding – NGN)

UK Mirror WG members - H Kang, D Otto, W An, D Fu, D Meadows, R Smalley, C McTaggart, V Terzija, T Spearing, B Chong, C Booth, L Lei Lai, B Pal & F Coffele

Two meetings held so far. A large group.

**WG B5.44 Protection Schemes for Special Transformers**

Convenor – Zoran Gajic (SE)

UK members – E Bainbridge & M Stockton (both regular)

First meeting held May 2011 with 4 attendees. Structure completed and tasks assigned. Next meeting to be re-scheduled.

**WG B5.45 Acceptance, Commissioning and Field Testing Techniques for Protection and Automation Systems**

Convenor – Eric Cahuet (FR)

UK members – J Wright (regular) & L Yang (corresponding - NGN)

Two meetings held and some contributions have been received.

**WG B4/B5.59 Control and Protection of HVDC Grids**

Convenor - K Koreman (NL)

UK members – F Hassan & R Zhang (both regular) & A Osman (corresponding - NGN)

The UK members have not been contacted yet by the convenor and progress is unknown.

If any person is interested in the activities of Study Committee B5 and would like to be kept informed or participate in a working group, where possible then please either visit the website [www.cigre-b5.org](http://www.cigre-b5.org) or contact:

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