

CIGRE STUDY COMMITTEE B5
MINUTES OF UK LIAISON MEETING
HELD ON 19th JUNE 2012
AT
NATIONAL GRID, WOKINGHAM

Attendees:

Richard Adams
John Fitch
Peter Crossley
Phil Beaumont
Grant Bolger
Ibrahim Abdulhadi
Derek Fleming

UK Regular Member

Richard Adams' term as UK Regular Member of SC B5 ends this year and the new member will be John Fitch (John.Fitch@nationalgrid.com). Officially the transition takes effect in Paris and an email will be circulated nearer the time reminding people of the change.

Report on 2011 Colloquium

The 2011 colloquium was held 12 – 17th 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. There were around 135 delegates.

There were three preferential subjects as follows:

- IEC 61850: Which Tools for Whom
 - Special Reporter – Anders Johnsson (SE)
 - 19 papers & 36 contributions
- Protection of Hybrid Line/Cable Circuits
 - Special Reporter – Luc Uyttersprot (BE)
 - 9 papers & 28 contributions
- Performance of Protection Systems under Stressed Conditions
 - Special Reporter – Raul Sollero (BR)
 - 14 papers & 45 contributions

A tutorial entitled "IEC 61850 – Moving towards Edition 2" was presented. On the Saturday immediately after the colloquium a technical tour to CERN was included.

Report on 2011 SC B5 Meeting

The committee meeting was held on Friday 16th September and attended by around 41 members, observers and convenors.

Since Javier Amantegui, SC B5 chairman, decided that he will stand down from the role in 2012 due to work commitments, Iony Patriota de Siqueira (Brazil) will become the new chairman. The new secretary will be Rannveig Løken (Norway). Also, Klaus Peter Brand will replace Ivan De Mesmaeker as convenor for the Tutorial Advisory Group which coordinates tutorial material from working groups for presentations and organises the tutorials at colloquia.

The 2013 colloquium will be held in Belo Horizonte, Brazil. It will be held in conjunction with SIMPASE, a biannual event held by the Brazilian National Committee, involving B5, C2 (Operations) and D2 (Communication) 25th to 31st of August, 2013. The venue will be Ouro Minas Hotel (<http://www.ourominas.com.br>).

The three preferential subjects will be as follows and the call for papers is expected later this year:

- PS1 - Acceptance, Commissioning and Field Testing for Protection and Automation Systems
 - Type-, FAT- and SAT functional tests of digital protection relays
 - Type-, qualification-, FAT- and SAT functional testing of Digital Substation Automation Systems
 - Test systems used for qualification, FAT and SAT of IED and DSAS functions
 - Use of predefined test scenarios and batch testing
 - Testing of distributed functions and multi-functional IED
 - Coordination, Documentation and acceptance procedures for the different test types

- PS2- Experience & Application of non-conventional Instrument transformers to modern relays
 - Study the transient response of different types of Non-conventional Instrument transformers (current as well as voltage) on different transients in primary power systems, generally recognized as important for dependable operation of different protection functions as well as for power quality measurement.
 - Study the transient response of different transducers intended for potential use in Merging Units. This includes between others also current and voltage input transformers (of conventional and non-conventional design), passive and active filters used generally before A/D converters and the converters themselves.
 - Examine also the adequacy of proposals for further use in emerging protection technologies like protection functions based on travelling wave theory, and similar.
 - Propose on the basis of results obtained the minimum required transient accuracy of a complete conversion chain, which can be used as a basis for design of different protection, control and monitoring algorithms within IEDs. The final result should consider also the well-known transient response of conventional instrument transformers and should make possible comparison with performance of signal conditioning circuits within existing protective devices.

- PS3- Protection, Monitoring and Control of Shunt Reactors and Special Transformers
 - Characteristics of special transformers important for protection scheme design ;
 - Zero sequence properties of special transformers;
 - Differential protection schemes for special transformer;
 - Other protection functions for special transformers;
 - Control for special transformers.

A tutorial will also be held, though the subject will not be finalised until the Paris Session.

Verbal invitations for 2015 colloquium were received from India, China and Russia.

This prompted some discussion as to whether we as UK should try to host a B5 colloquium. The previous B5 (or SC34 as it would have been then) held in UK cannot be remembered. An invitation was made for 2011, but this was withdrawn later, following the global financial markets slump and the prospects of trying to raise sponsorship in a relatively short space of time, coupled with a number of logistical issues. It was agreed that the question should be raised about the possibility of hosting a 2017 colloquium, since this might give enough advance notice to address some of the previous issues. Richard Adams will raise the idea with CIGRE-UK to solicit their views.

4 new working groups were selected to start and these are:

- B5.46 Application and management of cyber security measures for P&C systems
(Convenor – Denis Holstein (US))

- B5.47 Network Protection Performance Audits
(Convenor – Peter Watson (UK))

- WG B5.48 Protection for developing network with limited fault current capability of generation.
(Convenor – Bin Su (China))

- WB5.49 Protection & Automation of Shunt Capacitors
(Convenor – Simon Chano (CA))

UK members have been put forward to all of these.

Generally the rules are that there should only be one or two members from any country in each WG and the suggestion is one regular member and a 'younger' (NGN) member to assist them. In order to allow those interested to participate in WG's and not dampen enthusiasm/interest, a UK 'Mirror' WG' could be established to support the regular member and NGN member where there is sufficient interest. These mirror group members will hopefully be able to contribute to the WG and technical brochure via the regular member.

Working Groups/Documents Published

The following documents have been published in the past 12 months in Electra:

- Electra October 2011 – TB 479 - B5.04 International Guide on the Protection of Synchronous Generators
- Electra December 2011 – TB 484 - B5/B4.25 Impact of HVDC Stations on Protection of AC Systems
- Electra June 2012 – B5 Annual Report

The following documents are due to be published shortly:

- WG B5.31 – Life-time Management of Relay Settings
- WG D2/B5.30 - Line and System Protection using Digital Circuit and Packet Communications
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Please see Appendix A for a complete list of working groups, showing latest progress and UK members.

Any suggestions for new possible working groups to be put forward for consideration at the SC B5 meeting in Lausanne would be accepted. Possibilities mentioned at the meeting were:

- Adaptive/Dynamic Protection Techniques
 - Definition of requirements
 - Applicable to medium voltage and transmission
- Application and Experience of System Integrated Protection Schemes (SIPS)
 - Reliability concerns
 - Impacts of maloperation/failure to operate
- Fault Location on Complex Networks
 - Impacts of embedded generation
 - Impacts of reversible power flows
- Detection of Subsynchronous Resonance (SSR) and Other Network Issues

These will be put forward for consideration in the Paris meeting.

Matters from CIGRE-UK AGM/CIGRE-UK Website

The CIGRE-UK AGM and UK Technical Committee Meeting were held on 30th November at National Grid offices in Warwick.

Nick Winsor replaces Chris Jones as chairman and Adam Middleton replaces Nick Winsor as vice chairman.

It was decided in 2010 to try to arrange at least one CIGRE-UK event per year. The first event was held 21st September 2011, hosted by Alstom Grid in Stafford and themed "Connection of Remote Offshore Windfarms" (approx 150 delegates). This included a tour around the Voltage Source Converter (VSC) HVDC demonstrator centre and was followed the next day by an optional tour around ALSTOM Grid's manufacturing and testing facilities. The second event was held 14th March 2012, hosted by ABB in Newcastle-under-Lyme and themed "UK & European T&D Network Solutions to the Challenge of Increasing Levels of Renewable Generation" (approx 130 delegates). This was followed the next day by a visit to the Shotton HVDC converter station, currently under construction and which is part of EirGrid's East-West Interconnector that will link the UK and the Republic of Ireland. A third event in 2013 is intended to be protection biased and will be hosted by University of Manchester.

As a result of the value of CIGRE being promoted by UK Executive over the last few years, the number of UK members now stands at 633 (2011 figures), comprised as follows:

- 182 Individual members
- 52 Collective I members (companies) – count as 5
- 13 Collective II members (universities) – count as 2
- 159 NGN members + 40 associate members
- 6 Honorary members

The number of universities has dropped now that a membership fee is charged – membership was free for a time in an effort to promote the benefits of CIGRE membership.

Any additional new collective or individual members are always welcome and should be advised to Richard Adams, or directly to Colin Ray at CIGRE-UK. The website is www.cigre-uk.org

Amir Khan provided an update on the status of CIGRE-UK NGN for the meeting.

Co-operation with IET/Republic of Ireland

A number of IET events are supported by CIGRE.

The IET held a one day Power System Protection seminar on 30th September at Austin Court in Birmingham, where an update of CIGRE SC B5 activities was presented.

The IET Developments in Power System Protection conference DPSP 2012 was held 23-26 April 2012 at the ICC, Birmingham.

Paris Session 2012

The 2012 Paris Session will be held 26th – 31st August. The official opening ceremony will be on Sunday 26th at 16.00, given by Liu Zhenya, President, State Grid Corporation of China and titled “Strong & Smart Grid – A driving Force for Energy Development in the 21st Century”

Monday will include the Opening Panel (“The role of Electricity Systems in Reducing Energy’s Environmental Footprint”), the workshop on “Large Disturbances” and also a cocktail reception at 18.30 on the 3rd level. The cocktail is open to all.

Tuesday will include a B5 Poster session (14:30 – 18:00) and then from 19:30 – 23:00 a Cocktail Reception & Private Visit of “Musée du Louvre” (Invitations to be collected at the “Soirée’s Desk”) – this replaces the event held on the Thursday evening in previous years.

Wednesday includes the SC B5 Administrative Meeting and then in the evening there will be the UK Networking Function (previously named Cocktail Reception)

The SC B5 Session will be held on Friday 31st August (8.45 – 18.00). There are two preferential subjects as follows:

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

There are 3 UK based papers, all for PS1:

- Performance verification and scheme validation of adaptive protection schemes
 - Abdulhadi, F. Coffele, A. Dyško, C. Booth, G. Burt, G. Lloyd, B. Kirby
- Performance assessment of IEC 61850-9-2 based protection scheme for a 400kV transmission system mesh corner
 - P Crossley, L Yang, H Li, U Anombem, W An, R Chatfield, J Wright, M Redfern, X Sun

- Smart Algorithms to accommodate distributed generation in the grid
 - C An, G Millar, G Lloyd

Any Other Business

A reminder of the e-cigre website, with free electronic download of many documents available to members at www.e-cigre.org

Meeting will be held annually, date to be advised by John Fitch nearer the time.

The SC B5 website is www.cigre-b5.org

The meeting concluded after a short presentation regarding control operations for the National Grid, followed by a viewing of the control room.

Thanks to John Fitch for arranging to host the meeting.

Appendix A

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 B5.14 - Wide Area Protection & Control Technologies

Convenor – V Terzija (UK)

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

Expected to complete 2012.

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

Convenor – Luc Uyttersprot (BE)

UK member – John Fitch (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. Final meeting to be held in Paris.

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)

Published December 2011, Technical Brochure 484.

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)

Convenor – 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

Complete, circulated for comment and will be sent to Paris for Publishing.

WG B5.31 Management of Protection Relay Settings

Convenor – Peter Crossley (UK)

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

Complete, circulated for comment and will be sent to Paris for Publishing.

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

Convenor – D Tholomier (CA)

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 – was L Lei Lai (corresponding), but he has now moved to China

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 - 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. Second meeting postponed – group may have stalled.

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 progress is unknown.

WG B5.46 Application and management of cyber security measures for P&C systems

(Convenor – Denis Holstein (US))

UK members – S Thompson (regular) & T Rahman (corresponding - NGN)

WG B5.47 Network Protection Performance Audits

(Convenor – Peter Watson (UK))

UK members – J Wright (regular) & W An (corresponding)

1st meeting to be held in Paris.

WG B5.48 Protection for developing network with limited fault current capability of generation.

(Convenor – Bin Su (CN))

UK members – N Pogaku (regular) & F Hashiesh or P Newman (corresponding).

It may be possible to set up a mirror group for this if there is sufficient interest.

WG B5.49 Protection & Automation of Shunt Capacitors

(Convenor – S Chano (CA))

UK members – D Fleming (regular) & B Chong (corresponding - NGN), possibly also A Wixon to assist.