



**2005 SC B1 PROGRESS REPORT
(INSULATED CABLES)**

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1 Overview

The main highlights of 2005 are:

- SC B1 launched its new web site on June 15, 2005 with the same layout as the main CIGRE one.
- The SC disbanded one Working Group (WG) and two SC Task Forces (TFs) at the foreseen deadlines, the publications relative to the WG work will be issued soon,
- The SC published four technical brochures on highly sophisticated topics, record for our SC,
- The SC launched two WGs, and four Task Forces, three of them having to prepare the terms of reference of potential WGs.

2 SC organisation

The activities of CIGRE Study Committee B1 concern all types of AC and DC insulated cable systems for land and submarine connections and are focused mainly on high voltage applications. Whenever appropriate, however, lower voltage applications are also considered.

Within this field, the scope of work of the Study Committee covers theory, design, applications, manufacture, installation, testing, operation, maintenance and diagnostic techniques.

The main goals of the SC B1 are the following:

- to contribute effectively to the progress in insulated cable systems technology,
- to facilitate the integration of insulated cable systems in electric power networks and in the environment, covering the complete life cycle of cables,
- to maintain its leading position in the field of power cables by providing unbiased and neutral information on all essential cable aspects,
- to be recognised by the Electric Power Industry and others as a leading and reliable partner with competence in all engineering issues related to insulated cable systems, i.e. technical, economical, ecological and social.

The basic operating structures of the SC are its Working Groups. Their effective performances are based on a clear definition of their terms of reference and on work plans with specific time limits (typically three years).

In order to achieve this, it is the normal practice of SC B1 to set up an **ad hoc** Task Force (TF) to define the terms of reference of a new WG prior to its establishment. The duration of this type of TF must not exceed one year.

SC TFs may also be set up to study and/or update specific topics that do not justify the establishment of a full WG.

The SC is composed by 24 Regular Members, 9 Observer Members, a Secretary and a Chairman, 12 coming from Utilities, 14 from Manufacturers and 9 from Universities/Institutes.

The SC B1 has its web site at the following address: www.cigre-b1.org. The SC Secretary is also the web master.

3 Publications

Published in 2005

WG/TF number	Name of the Publication	Publication in Electra	Publication date and number of the technical brochure
TF B1.16	Addendum to "Recommendations for tests of power transmission DC cables for a rated voltage up to 800 kV"	February 2005	Electra 218
WG B1.05	Transient voltages affecting long cables	April 2005	Electra 219 TB 268
WG B1.03	Large cross sections and composite screens	June 2005	Electra 220 TB 272
WG B1.04	Maintenance of HVAC underground cables and accessories	August 2005	Electra 221 TB 279
WG B1.18 TF B1.13	Special bonding of HV cables	October 2005	Electra 222 TB 283

To come

WG/TF number	Name of the Publication	Publication type	Publication date
WG B1-06	Revision of qualification procedures for underground HV cable systems	Summer 2006	

TB : Technical brochure

4 2005 main events

The 2005 SC B1 Meeting was hosted by Sweden and a tutorial was held prior to the Meeting for the Swedish experts. The Meeting was held from September 14th to September 16th, 2005.

5 2006 main events

As usual, CIGRE will hold a Session on August 28 – September 1 in Paris. The SC B1 Discussion Group Meeting will be held on Tuesday, August 29th, 2006 where 26 accepted papers will be discussed.

Fredrik Rüter (SE) was nominated as Special Reporter.

The Preferential Subjects are:

PS 1: Products development and new installations of High voltage AC and DC underground and submarine cable systems

- latest state of the art of cables and accessories
- improvements and developments of products and systems
- testing
- new installations

PS 2: Operation and maintenance of High voltage AC and DC underground and submarine cable systems

- service experience
- monitoring and diagnostics
- operation and maintenance policies and practices
- up-rating, upgrading
- life cycle assessment

PS 3: Cable systems in the changing operating environment

- environmental restrictions, social awareness
- economical constraints
- relevant issues from dispersed generation
- relevant issues from distribution systems
- utilisation of existing assets

6 Administrative report

6.1 SC Meeting

One WG and two TFs finished their work and were disbanded. The WG kept an editorial team to finalise its documents to be published as Technical Brochure and Electra paper.

- **WG B1.06** "*Revision of qualification procedures for extruded HVAC underground cable systems*", (to be published as a technical brochure, a summary paper will be published in Electra during Summer 2006)
- **TF B1.17** "*Third party damages on underground and submarine cables*". The work of TF B1.17 launched last year was to consider whether a full working group was desirable on third party damages on underground and submarine cables.
- **TF B1.18** "*Working gradients and Jointing workmanship on extruded High Voltage cables*" The work of TF B1.18 launched last year was to consider whether a full working group was desirable on Working gradients and Jointing workmanship on extruded High Voltage cables.

In 2005, SC B1 launched two new Working Groups and four Task Forces:

- **WG B1.21** "*Third party damages on underground and submarine cables*" which term of office is 2008,
- **WG B1.22** "*Cable accessories workmanship*" which term of office is 2008,
- **TF B1.23** "*Impact of EMF on current ratings and cable system*" which term of office is 2006,
- **TF B1.24** "*Test procedures for HV transition joints*" which term of office is 2006,
- **TF B1.25** "*Advanced design of laminated metallic coverings*" which term of office is 2006,
- **TF B1.26** "*Earth potential rises in specially bonded screen systems*" which term of office is 2007,

SC B1 currently has three Advisory Groups, seven WGs and four TFs and participates in one JWG with another SC and in one JTF with another organization.

6.2 TC Award

Georg Balog (NO) and Eric Dorison (FR) were honoured with the CIGRE Technical Committee Award 2005 for their contribution to the work of the Study Committee.

6.3 Web site

The TC decided last year to launch new web sites for the SCs, all with the same lay out as for the main CIGRE web site. For this project, our Secretary was named representative of all SCs by the TC. One year later, the 16 web sites are available, one for each SC and B1 web site (www.cigre-b1.org) was the first to be on line, on June 15, 2005.

It offers an open space to the public and private pages to SC Members. Each Working body has private pages where documents can be exchanged among members.

It confirms that Internet is a very important tool for internal and external communication.

The Secretary is also the SC B1 web Master.

7 Technical report

7.1 Advisory Groups

7.1.1 Strategic Advisory Group

Convener: Reinhard Schroth (Germany)

A permanent Strategic Advisory Group (SAG) was set up in 2002, which terms of reference are to assist the Chairman in the definition of the strategic directions that should be followed by SC B1.

The SAG is composed of a limited number of members: the Chairman, who will convene, the SC Secretary, and a few other SC Members or experts, all chosen by the Chairman.

The Conveners of the other SC B1 Advisory Groups are permanent members of the SAG.

The SAG will consider, if needed, the set up of other specialized Advisory Groups and will decide about the use of their outcomes.

The SAG will initiate, whenever appropriate, the set up of new TFs or WGs.

The SAG will meet at least once a year, but will communicate as required.

All the items discussed during the 2005 SAG meeting were covered in the 2005 SC B1 meeting agenda.

7.1.2 Customer Advisory Group

Convener: Eugene Bergin (Ireland)

A permanent Customer Advisory Group was installed in SC B1 with the Scope to implement CIGRE TC's suggestion, that "Study Committees have to ensure that the needs of their Target Groups are fulfilled." The B1-CAG is the working body within SC B1 to co-ordinate all activities in this field. It works in close contact with the SC Chairman and the Strategic Advisory Group B1-SAG and involves all SC B1 members as contacts and interfaces to their national or local customers.

The Terms of Reference (ToR) of the B1-CAG are as follows:

1. Identification of Target Group

- systematically identify SC B1's Target Groups in different countries
- listing of respective organizations, persons, social groups, etc.
- analyzing of organizational levels and hierarchies
- identifying of most important and influential addressees

2. Communication means with TGs

- develop systematic and effective concepts for active contacts and communication
- consider how to implement sustainable communication links to organizations and persons
- consider how to disseminate most effectively B1's activities and outcomes to TGs
- propose appropriate presentations (Paris Session, Tutorials, Symposia, etc.) in accordance with the TAG

3. Collection and mapping of TG's needs

- identify problems and map systematically needs of TGs
- propose review/revision of current SC B1 activities with regard to needs of TGs

4. Collection and evaluation of feed-back from TGs

- collect and map the degree of TG's satisfaction
- evaluate the findings and derive, if necessary, measures for improvements and new actions
- identify opportunities to increase TG's satisfaction
- coordinate activities at national level where appropriate

During the past year, the CAG studied:

- The way to contact the customers. It was agreed that the only way was through TC and CIGRE National Committees to avoid the Target Groups being contacted by the 16 CAGs. As there are only 3 CAGs already efficient, it was proposed to elaborate a common strategy and ask our Chairman to present it to the TC meeting.
- The needs of our Target Groups that our work should focus on. One main point collected from the questionnaire circulated during the 2004 Session was the lack of expertise in the utilities and this should drive our work for the future.
- The way to improve the Session format even if this problem could not be solved at the SC level, but needs consideration from the TC and the Central Office.
- The way to disseminate our work and to thank the companies that contributed to it.

7.1.3 Tutorial Advisory Group

Convener: Pierre Argaut (France)

A permanent Tutorial Advisory Group was installed in 2004 in SC B1 with the Scope to implement CIGRE TC's suggestion, that "Study Committees have to deal with education, continuous training, tutorials and publications". The B1-TAG is the working body within SC B1 to co-ordinate all activities in this field. It works in close contact with the EPEE, the SC Chairman, the Strategic Advisory Group B1-SAG and the Customer Advisory Group B1-CAG. It involves all SC B1 Members and Conveners as contacts.

The Terms of Reference (ToR) of the B1-TAG are as follows:

1. Identification of the potential groups interested in education, continuous training, tutorials or technical presentations
 - identify SC B1's Tutorial Target Groups in different countries,
 - listing of respective organisations: students, young or older engineers, universities, etc...,
 - identification of the respective expected topics to be taught and training levels,
 - identification of other learned societies, IEE, IEEE,....
2. Identification of the means to disseminate the SC B1 knowledge
 - prepare the structure of appropriate presentations (Paris Session, Tutorials, Symposia, events organised by other learned societies, etc.) in accordance with the CAG
3. Collection of SC presentations
 - establish an education and training procedure
 - preparation of a standard presentation,
 - each SC working body will prepare a full presentation (up to 30 slides),
 - the TAG will prepare a synthetic presentation (up to 4 slides)
4. Coordination of activities with EPEE and with other SCs

To compensate the lack of expertise, one solution is to propose technical education and training through tutorials that could be addressed from basic to advanced experts, from students and teachers to managers and public.

The TAG proposed a common tutorial structure that could be easily managed according to the depth needed by the public.

Each current and new WG will have in its terms of reference the production of a tutorial. For the past WGs, some SC B1 experts will have to prepare the relevant tutorials.

7.2 Working Groups

7.2.1 WG B1.06 Revision of qualification procedures for underground HV cable systems

Convener: Jean Becker (Belgium)

WG B1.06 was set up in 2002 and presented its final report in 2005.

The terms of reference were :

For the range of AC extruded underground cable systems for voltages above 30 kV up to 500 kV, review and complete the qualification procedures for the different HV voltage ranges with the goal to come quickly and economically to the market with innovative solutions but without jeopardising the reliability of the installed system:

- propose tests where there are lacks: e.g. short circuit tests, climatic tests on terminations etc.,
- evaluate whether in high voltage systems up to 150 kV a long term test has to be recommended above given dielectric service stresses or where the innovation is not built on earlier experience,
- define what "earlier experience" means,
- in case of major innovations in EHV cable systems evaluate whether long term tests can be replaced by shorter ones, which should be defined by the WG,

in order to build up a guide of qualification procedures depending on earlier qualification(s) at the same and/or different voltage levels and on field experience.

The WG set up 3 TFs. Their scope could be summarised by what should be done, what has been done and what could be done about the revision of the qualification procedures. It was noticed that the feedback from the breakdowns is lacking. The interest of long term tests for cables systems under 170 kV was discussed.

The WG proposed several recommendations regarding qualification of cable systems and re-qualification in case of substantial changes in the cable system.

The work was highly appreciated and the report considered of very high value, e.g. as a guideline for the revision of the respective IEC specification. A Technical Brochure will be available in Summer 2006.

7.2.2 WG B1.07 Statistics on underground cable in transmission networks

Convener: Steve Swingler (United Kingdom)

WG B1.07 was set up in 2003 and is due to present its final report in 2006.

The terms of reference are the following:

- To collect statistics for the lengths of underground and overhead circuits at a range of transmission voltages. Only existing lines and projects planned for implementation by 2006 should be included,
- To describe significant underground cable projects realised in the period 1996-2006 giving the reasons why undergrounding was selected,
- To describe the factors which must be considered when evaluating the cost of overhead or underground connections,
- To describe the other factors which must be taken into account in order to make a balanced choice between overhead and underground technology.

It was agreed to exclude submarine cables and DC ones as they are usually submarine, but it will be necessary to explain the main DC land projects.

The voltage range will be above 50 kV limited to transmission levels according to the countries.

The WG will concentrate on cable systems longer than 2 km as shorter cable systems have important fixed costs and may give different conclusions.

Conclusions will be provided according to the voltage range, 50-110 kV and above 110 kV.

The target of the report is to have a wide audience: utilities, manufacturers, governments, politicians, developers, environmental campaigners and to make choosing between cable and overhead line a more transparent process.

The report will be composed of significant cable projects, i.e. of international interest in engineering, commercial, environmental or social terms. Each project will be introduced with the basic details of construction of the cable, the installation methods and the reason for these choices and why was undergrounding chosen. No cost ratio will be proposed as each project is specific and could not be used as a general figure, but the components of the cost will be discussed.

7.2.3 WG B1.08 Cables systems in multipurpose or shared structures

Convener: Ken Barber (Australia)

WG B1.08 was set up in 2004 and is due to present its final report in 2007.

The terms of reference are the following:

- To establish the appropriate terminology,
- To collect comprehensive information and experience on the use of multipurpose or shared structures for the installation of cable systems. It is anticipated that a comprehensive questionnaire developed by the WG will be necessary. The survey should not be limited to technical aspects such as type of cables, structure design, construction, installation, other infrastructure installed, mutual impacts, maintenance and operational constraints. It should also consider economical aspects, occupational health and safety aspects, administrative aspects, legal aspects and decision-making aspects,
- To collate, summarise and review the information,
- To identify the issues that need to be considered when installing underground cable systems in multipurpose or shared structures,
- To recommend guidelines for the practical application of for the installation of cables.

The scope of work should cover:

- MV, HV, and EHV cables,
- Solid, fluid and gas insulated cables,
- Multi-purpose tunnels and structures shared with pipe services (water including hot or cooled, oil, gas and sewage) and other utilities (other electricity services and telecommunications), Transport services (Roads, Railways and Subways).

There is a low probability of fault on cables installed in tunnels but when it occurred, the impact is high, justifying such a group.

Compared with the initial terms of reference discussed during the 2004 SC meeting, it was added, following the creation of JWG B3/B1.09, that the specific technical aspects of GIL will be investigated by JWG B3/B1.09 which will give relevant technical input to WG B1.08. The groups will share information by mutual participation of at least one of their members.

The WG agreed on the definition of a shared structure: "Any continuous structure containing one or more utility services which permits the replacement, renewal, maintenance, repair or revision of the service without the necessity of making excavation. This implies the structure is traversable by people and in some cases by some sort of technology".

A questionnaire is under preparation and will be circulated among the SC Members.

7.2.4 WG B1.09 Remaining life of existing HV AC underground lines

Convener: Willem Boone (The Netherlands)

WG B1.09 was set up in 2004 and is due to present its final report in 2007.

The terms of reference are the following:

- To prepare proper definitions for "End of life/Remaining life"
- To list relevant cable and accessory types,
- To list information to be collected,
- To review relevant ageing mechanisms for paper cable- and extruded cable systems,
- To list defects that contribute to dramatic ageing,
- To review appropriate diagnostic methods,
- To review experience in remaining life estimation (RLE), the techniques used and the success of these techniques,
- To develop a strategy for RLE of paper- and extruded cable systems, based on condition assessment, ageing mechanisms, condition extrapolation to failure for the related cable/accessory types,
- To collect a few case histories,
- To give guidelines for practical application of a strategy for RLE, indicating the accuracy, the effectiveness and the efficiency of applied techniques and methodology.

The scope of work is for voltage over 50 kV:

- Paper cable systems (SCFF and HPFF) for AC application on land,
- Extruded cable systems for AC applications on land,

Remaining life is an important topic, which is much sought by most utilities. It is clear that it won't be possible to exactly say how long the cable system has still to live. To convert the risk of failure, the high cost of operation or the excessive cost of maintenance of a specific line in remaining life estimation will be a first important step ahead. This could be done by giving criteria that lead to replacement.

The final report will contain guidelines for practical application of a strategy for remaining life estimation indicating the accuracy, the effectiveness and the efficiency of applied techniques and methodology.

7.2.5 WG B1.10 Update of Service Experience of HV cable systems

Convener: Robert Rosevear (United Kingdom)

WG B1.10 was set up in 2004 and is due to present its final report in 2007.

The SAG identified service experience as a topic which was not addressed since long, as the last figures published by CIGRE regarding underground cables dealt with the experience gained between 1982 and 1986, those regarding accessories for HV cables with extruded insulation dealing with the experience gained up to 1992 and the last figures regarding submarines cables being published in 1986.

The terms of reference are:

To update up to 2003 existing service experience and previously published information studying at least:

- Technology,
- Laying zone (urban, rural, submarine,...),
- Type of current (AC, DC),
- Internal or external faults,
- Type of cable burial, (protection or not)
- Number of faults per year per mileage,
- Fault duration,
- Repair duration.

Scope of work :

- The voltage range will be above 50 kV limited to transmission levels according to the countries.
- AC and DC cables,
- Land and submarine cables.

The survey on land cables will be limited on the data from 2000 to date. It was considered difficult by the WG to get all the necessary information between the 1986 inquiry and 2000. The questionnaire is the same as for the 1986 inquiry with more concise questions and some added items such as transition joints.

The survey on submarine cables will cover the period from 1991 to 2004.

7.2.6 WG B1.11 Upgrading and Uprating of Underground Cable Systems

Convener: Frederic Lesur (France)

WG B1.11 was set up in 2004 and is due to present its final report in 2007.

The difficulties to obtain planning permission for new sites favour the life extension of existing facilities, with the goal of transmitting more power with higher reliability.

The terms of reference are:

- To review the literature on similar subjects (IEC, CIGRE, IEEE publication),
- To establish the appropriate terminology,
- To inventory the possible technical solutions for increasing the transmitted power in an existing cable system, or extending the life duration of the cable system
- To gather available utility experience in such cases,
- To list the technical and environmental issues to be addressed in such cases,
- To propose a step by step approach.

Scope of work :

- AC and DC cables
- Extruded and lapped cables
- Land and submarine cables
- Cooling systems.

The study will be limited to whole cable systems, not considering the components themselves.

7.2.7 WG B1.21 Third party damages on underground and submarine cables

Convener: Christian Jensen (Denmark)

WG B1.21 was set up in 2005 and is due to present its final report in 2008.

Utilities are already suffering for a long time from third party damages, the damages caused to cables from so-called external origins: usually digging activities but also indirect aggression such as overheating, corrosion or change of backfill due to other utilities. Compared with the efforts to solve "internal" damage, issues are usually treated in an off-hand or unmanaged way, although in terms of money it is a very serious problem.

The terms of reference are:

To give guidance to all relevant parties involved (cable owners, utilities dealing with electricity, contractors, authorities, other utilities) as follows:

- To define the right terminology.
- To collect information worldwide about third party damage failure statistics. To collect information about main "damagers", the most sensitive areas and the most "dangerous" civil works techniques.
- To collect information about existing practices to control/solve the problem in different countries around the world.
- To propose improvements to present methods, after examination and comparison of present methods/practices.
- To propose guidelines on how to effectively control/reduce third party damages of cables.

Scope of work :

- AC and DC cables.
- Land and submarine cables.
- MV (whenever appropriate), HV and EHV.
- Mechanical, thermal damages and, more generally, all damages caused by human activities.

7.2.8 WG B1.22 Cable accessories workmanship

Convener: Kieron Leeburn (South Africa)

WG B1.22 was set up in 2005 and is due to present its final report in 2008.

One of the trends in the cable technology is the reduction of the cable insulation thickness and therefore the growing of electrical stress based on a better knowledge of the insulating material and the extrusion process. As the cables are made under well-defined factory conditions, their quality and reliability are usually assured. Accessories, however, are mounted on site, and even if this job is done by skilled and trained jointers, it is realized in more delicate and undefined conditions than in the factory.

In view of safeguarding the cable system's reliability which utilities rely on, it is important to study the electrical stress limits in the different types of joints, to learn about the safety margins between theoretical and practical strength levels, to examine the necessary skills of jointers and relative Quality Assurance and to study the recent service experience of high stressed cables.

The terms of reference are:

- To review the literature on the subject
- To complete the terminology not covered by TB 177 "Accessories for HV cables with extruded insulation"
- To prepare an easy to understand guide that could be useful for non-technical customers aligned to IEC voltage ranges
- To prepare guidelines for jointers training. The objective is to have this document referenced in call for tenders

Scope :

- HV Extruded AC >30kV cable systems only (MV and HTS cables are excluded)
- Land and Submarine cable systems
- Special considerations may be needed for large conductors
- Types of joints and terminations
- Interface preparation (Different methods)

7.2.9 JWG B3/B1-09 Application of long high capacity Gas Insulated Lines in structures

Convener: Hermann Koch (Germany)

JWG B3/B1-09 was set up in 2004 by SC B3 and is due to present its final report in 2007.

As GIL is in SC B1 scope and as the relative expertise derives mainly from GIS depending on SC B3, it was decided by the CIGRE Technical Committee that this topic will be studied by a JWG led by SC B3.

The terms of reference are:

- To collect information on existing GIL installations in structures
- To identify the issues that need to be considered when installing GIL in specific or shared structures
- To give information how to handle large scale projects and to define what "long GIL" means

The study shall be limited to:

- Mechanical and thermal design,
- Ambient conditions,
- Laying, installation, and gas handling
- Testing, commissioning, and Quality control,
- Repair process,
- Safety risks,
- Life cycle analysis.

As aspects of interactions with other services in multipurpose or shared structures during construction, operation or dismantling are studied by WG B1-08, it is foreseen that this JWG will give relevant technical input about GIL to WG B1-08 and will share information by participating in this group.

7.3 Task Forces

7.3.1 TF B1.23 Impact of EMF on current ratings and cable systems

Convener: Walter Zenger (United States of America)

On one hand, cables installed in ferromagnetic pipes have a reduction of their ampacity due to losses in the pipes. On the other hand, to reduce EMF in cable systems, an installation in ferromagnetic pipes could be used.

Without evocating what could be the right EMF level over the cable system, it was considered of interest to study the impact of EMF on current ratings and on cable systems.

The TF is due to present in 2006 the Terms of Reference for a potential full WG on the above subject.

7.3.2 TF B1.24 Test procedures for HV transition joints

Convener: Steve Swingler (United Kingdom)

To extend existing networks, it is often necessary to use new technologies as the ones on the network are no more available or obsolete. The joints between these two technologies are called transition joints. To date, there are no test procedures to test them.

It is proposed to examine the interest of writing procedures on type tests and site tests.

The TF is due to present in 2006 the Terms of Reference for a potential full WG on the above subject.

7.3.3 TF B1.25 Advanced design of laminated metallic coverings

Convener: Pierre Mirebeau (France)

WG 21.14 published in 1992 "Guidelines for tests on high voltage cables with extruded insulation and laminated protective coverings"
Numerous improvements appeared on laminated coverings since and it was considered by the SC B1 Members that an update of the publication should be appropriate.

The TF is due to present in 2006 the Terms of Reference for a potential full WG on the above subject.

7.3.4 TF B1.26 Earth potential rises in specially bonded screen systems

Convener: Eric Dorison (France)

TF B1.26 was set up in 2005 and is due to present its final report in 2007.

Earth potential rises on cross bonded cable systems connected at each end to a substation are generally considered negligible but recent breakdowns seem to deny this opinion.

It is proposed to make a general study focused on earth potential rises on cross bonded cable systems connected to overhead lines called hybrid systems and on cross bonded cable systems directly linking two low resistance substations.

The Terms of Reference are:

To improve the design of special bonded screen systems, dealing with EPR, providing :

- more information on EPR which may occur during single phase to earth faults
- details of a calculation method based on the Complex Impedance Model.
- calculation examples for typical situations.

Scope of work :

- The voltage range will be limited to transmission levels according to the countries.
- Specially screen bonded links, using AC single-core cables,
- Land and submarine cables

7.3.5 JTF SCB1/ICC Interactions between CIGRE SCB1 and IEEE/PES Insulated Conductors Committee

Convener: Willem Boone (The Netherlands)

The activities to date are: exchange of relevant technical information, cooperation and coordination between working groups with similar activities. Moreover, ICC information has been added on the SC B1 web site after ICC having posted information on CIGRE SC B1 on its web site last year.

Presently, ICC is considering the option of a WG activity on CIGRE activities, whether or not in combination with IEC issues later.

During these five past years, significant progress was made for a better cooperation between several groups of both organizations dealing with the same or close subjects, generating an added value to the work produced by SC B1 and ICC.

It was decided:

- to continue the JTF with the same Convener,
- to launch a discussion group during the next Spring ICC meeting,
- to continue the process of exchange of information and of cooperation/coordination between working groups of CIGRE and ICC,
- to exchange information on how to motivate effective participation,
- to consider a joint seminar.