



SC B1 ADMINISTRATIVE HISTORY

1927 - 2007

During the nineteenth century, electricity was discovered and a few years after, insulated cables appeared, firstly at low voltages and rapidly the voltage level applied to insulated cables raised. During the first meeting of Cigre in 1921, there were already questions on cable systems, on a subject which is still under study nowadays, believe it or not, after laying tests! The questions asked were considered of importance and our Committee which was not "Insulated Cables" yet, started in 1927, six years after the launch of Cigre.

2007 gives the opportunity to celebrate the 80th anniversary. Such a long life is a token of success for all the past and present contributors, that spent their time and their energy lavishly for the success of the underground cable system technique.

Some cables laid during the first years of existence of our Committee are still serving the networks where they are installed, showing the longevity of cables when the design, the laying and the maintenance are of good-quality.

1 Committees

Three committees dealt with insulated cables, at the beginning: SC 2 from 1927 to 1967, and then SC 21. The scope of work of SC 21 was very close from the previous one. After 40 years of SC 2 and 35 of SC 21, SC B1 was launched within the new organisation of Cigre in 2002 and there too, the scope of work is not far from the previous ones. In the eyes of the past, we can be confident in the contribution of our Committee to the success story of cable systems to efficiently contribute to the electricity supply all around the world.

2 SC B1 Meeting Places

During the 80 years of existence, 63 SC meetings were held with, at the beginning, a frequency that was not a yearly one, but since 1951, nothing disturbed this perfectly smooth-running machine.

As all Cigre sessions are held in Paris, France and Paris are of course the leaders for holding Committee meetings. The SC only met nine times outside Europe: four times in USA, twice in Japan and once in Australia, South Africa and Canada.

It should be noticed that some countries with an important input in our Committee never welcomed SC meetings.

This should be repaired in the future.

| Country | Number of meeting in the country |
|-----------------|---|
| France | 36 |
| USA | 4 |
| UK | 3 |
| Germany | 2 |
| Japan | 2 |
| Switzerland | 2 |
| The Netherlands | 2 |
| Sweden | 2 |
| Australia | 1 |
| Austria | 1 |
| Belgium | 1 |
| Canada | 1 |
| Denmark | 1 |
| Italy | 1 |
| Norway | 1 |
| Russia | 1 |
| South Africa | 1 |
| Spain | 1 |

See meeting places next page

| Year | Country | Place of Meeting | N° Meeting | Date of Meeting |
|------|-----------------|------------------|------------|-------------------------|
| 1928 | France | Paris | 1 | January 1928 |
| 1931 | France | Paris | 2 | January 1931 |
| 1932 | France | Paris | 3 | 28 November 1932 |
| 1934 | Germany | Köln | 4 | 6 April 1934 |
| 1939 | France | Paris | 5 | 1 July 1939 |
| 1948 | France | Paris | 6 | 26 June 1948 |
| 1951 | France | Paris | 7 | 9 May 1951 |
| 1952 | France | Paris | 8 | 6 June 1952 |
| 1954 | France | Paris | 9 | 18 May 1954 |
| 1955 | UK | London | 10 | 19/20 April 1955 |
| 1956 | France | Paris | 11 | 6 June 1956 |
| 1957 | The Netherlands | Arnhem | 12 | 2/3 May 1957 |
| 1958 | France | Paris | 13 | 9/10 May 1958 |
| 1958 | Switzerland | Lausanne | 14 | 4/5 November 1958 |
| 1959 | France | Lyon | 15 | 22/23 April 1959 |
| 1960 | France | Paris | 16 | 21 June 1960 |
| 1961 | USA | Detroit | 17 | 6/7 April 1961 |
| 1962 | France | Paris | 18 | 25 May 1962 |
| 1963 | France | Monaco | 19 | 9/10 May 1963 |
| 1964 | France | Paris | 20 | 8 June 1964 |
| 1965 | USA | Detroit | 21 | 28/29 June 1965 |
| 1966 | France | Paris | 22 | 16 June 1966 |
| 1967 | Sweden | Stockholm | 23 | 29/30 May 1967 |
| 1968 | France | Paris | 24 | 24 August 1968 |
| 1969 | UK | Maidenhead | 25 | 9/10 September 1969 |
| 1970 | France | Paris | 26 | 27 August 1970 |
| 1971 | Russia | Leningrad | 27 | 2/3 September 1971 |
| 1972 | France | Paris | 28 | 1 September 1972 |
| 1973 | Belgium | Liège | 29 | 20/21 September 1973 |
| 1974 | France | Paris | 30 | 26 August 1974 |
| 1975 | USA | Boston | 31 | 3/4 September 1975 |
| 1976 | France | Paris | 32 | 30 August 1976 |
| 1977 | Norway | Noresund | 33 | 14/15 June 1977 |
| 1978 | France | Paris | 34 | 7 September 1978 |
| 1979 | Germany | Berlin | 35 | 11/12 September 1979 |
| 1980 | France | Paris | 36 | 29 August 1980 |
| 1981 | Japan | Tokyo | 37 | 29/30 September 1981 |
| 1982 | France | Paris | 38 | 4 September 1982 |
| 1983 | The Netherlands | Arnhem | 39 | 20/21 September 1983 |
| 1984 | France | Paris | 40 | 3 September 1984 |
| 1985 | Italy | Firenze | 41 | 9/10 October 1985 |
| 1986 | France | Paris | 42 | 1 September 1986 |
| 1987 | Austria | Wien | 43 | 4/5 May 1987 |
| 1988 | France | Paris | 44 | 31 August 1988 |
| 1989 | Canada | Toronto | 45 | 11/12 September 1989 |
| 1990 | France | Paris | 46 | 28 August 1990 |
| 1991 | Denmark | Copenhagen | 47 | 7/8 October 1991 |
| 1992 | France | Paris | 48 | 1 September 1992 |
| 1993 | Australia | Sydney | 49 | 29/30 September 1993 |
| 1994 | France | Paris | 50 | 1 September 1994 |
| 1995 | Switzerland | Zermatt | 51 | 12/13 September 1995 |
| 1996 | France | Paris | 52 | 29 August 1996 |
| 1997 | UK | Glasgow | 53 | 4/5 September 1997 |
| 1998 | France | Paris | 54 | 3 September 1998 |
| 1999 | USA | St Petersburg | 55 | 28/29 October 1999 |
| 2000 | France | Paris | 56 | 28 August 2000 |
| 2001 | Spain | Madrid | 57 | 20/21 September 2001 |
| 2002 | France | Paris | 58 | 30 August 2002 |
| 2003 | South Africa | Mabula Lodge | 59 | 27/28/29 August 2003 |
| 2004 | France | Paris | 60 | 1 September 2004 |
| 2005 | Sweden | Rosenön | 61 | 14/15/16 September 2005 |
| 2006 | France | Paris | 62 | 31 August 2006 |
| 2007 | Japan | Osaka | 63 | 29/30/31 October 2007 |

3 Chairmen and Secretaries

During the first 28 years, the Study Committee had been managed by a Chairman and a Secretary who were both Dutch. Up to now, the total Dutch contribution to the management is: 41 years of chairmanship, 30 as secretary and at present they still contribute with an important Convenership and involvement in Working Groups.

| CHAIRMEN | | SECRETARIES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------|-------------|----|----|----|----|----|----|----|---|----|---|-----|---|----|---|----|---|-------|----|--|---|---------|-------|----|----|----|----|-------|----|--|
| <table border="1"><thead><tr><th>Country</th><th>Sum</th></tr></thead><tbody><tr><td>NL</td><td>41</td></tr><tr><td>DE</td><td>10</td></tr><tr><td>IT</td><td>10</td></tr><tr><td>UK</td><td>6</td></tr><tr><td>NO</td><td>6</td></tr><tr><td>USA</td><td>4</td></tr><tr><td>FR</td><td>2</td></tr><tr><td>SE</td><td>1</td></tr><tr><td>Total</td><td>80</td></tr></tbody></table> | Country | Sum | NL | 41 | DE | 10 | IT | 10 | UK | 6 | NO | 6 | USA | 4 | FR | 2 | SE | 1 | Total | 80 | | <table border="1"><thead><tr><th>Country</th><th>Somme</th></tr></thead><tbody><tr><td>FR</td><td>50</td></tr><tr><td>NL</td><td>30</td></tr><tr><td>Total</td><td>80</td></tr></tbody></table> | Country | Somme | FR | 50 | NL | 30 | Total | 80 | |
| Country | Sum | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NL | 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DE | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IT | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UK | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NO | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USA | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FR | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SE | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Somme | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FR | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NL | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

See Schemes on the next two pages.

During the 80 years of life, the Committee was chaired by 13 Chairmen and 7 Secretaries helped them.

4 Working groups

Extract from a paper written in 1985, which is still valid 22 years later:

"Since its first meeting in 1928, Study Committee 21 has evolved considerably with the development of the technique and the use of high voltage cables. Without going into details, remember that the prominent features during the last thirty years were a very large increase in operating stresses, the implementation of new materials, the development of new designs, the increase of unit powers, the search for a better reliability. In all cases, the mastery of cable technique has become more and more complex. It is based on a scientific knowledge getting increasingly wider and requires to have recourse to techniques and know how's more and more specialised."

From 1928 to 1975, the Committee set up 13 Working Groups. In 1975, 11 were still active. Their duration was extremely long, up to 30 years for some of them and the annual SC meeting was the occasion to have a great Working Group meeting.

In 1975, Cigre decided to transform the Study Committee from a working and deciding body into a steering Committee. Working Groups moved from quasi-permanent ones with open fields to short duration ones with one or a few limited objectives. It was at that time that the one year duration TFs in charge of setting terms of reference of potential new Working Groups were set up. The reorganisation of the SCs in 2002 was an opportunity to confirm this way of working.

Since then, the policy has not moved so much, and consequently the number of Working Groups has greatly increased.

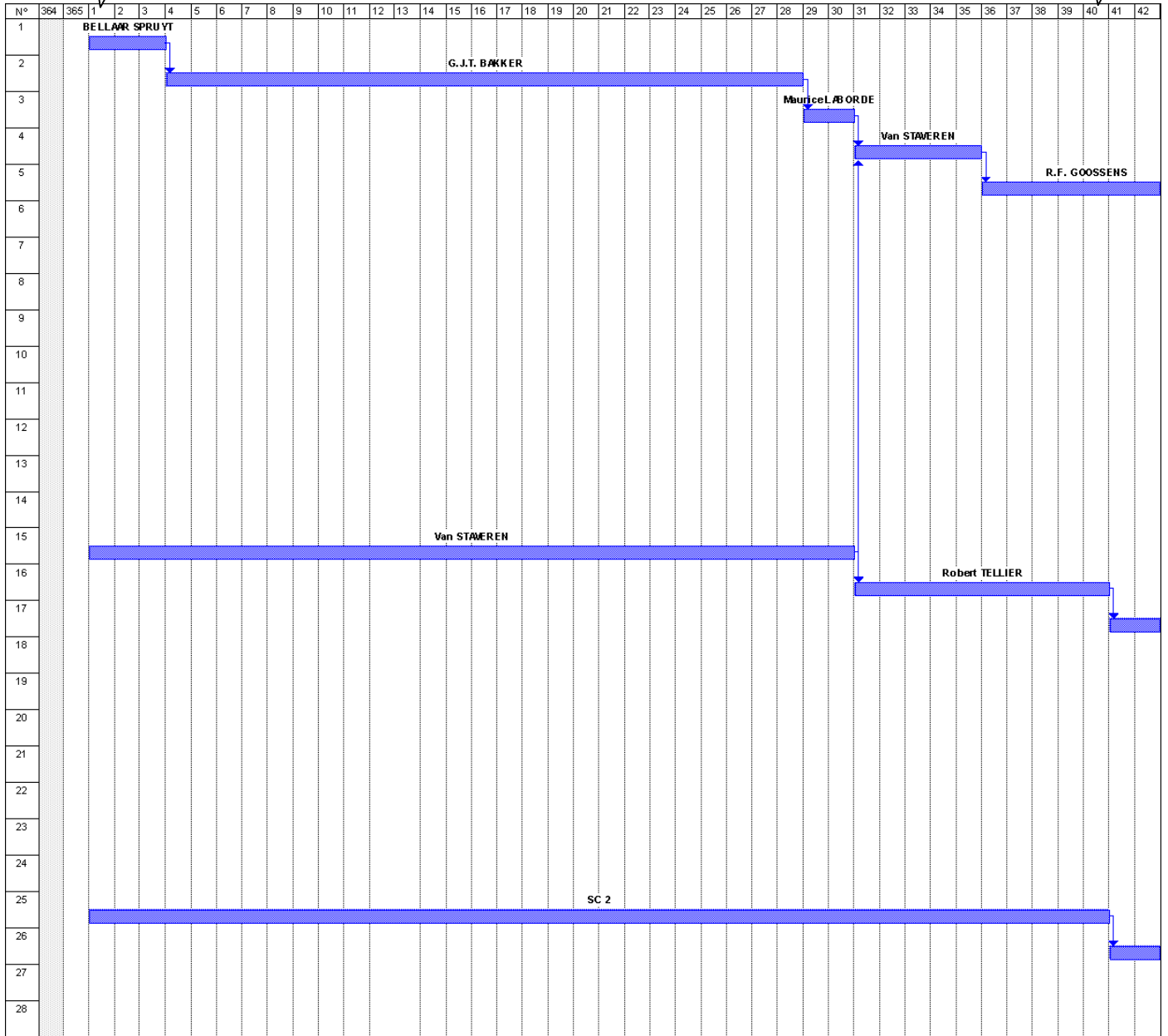
It is also at that period that Cigre decided to deeper cooperate with other technical bodies such as IEC, IEEE,...

In 2007, it is possible to draw up a table of the Working Groups. It has to be noted that these Working Groups have been instrumental in establishing the high standards which have allowed the Study Committee to become a recognised reference organisation in the field of high voltage cables,

1927

SC 2 life: 1927 - 1967

1967



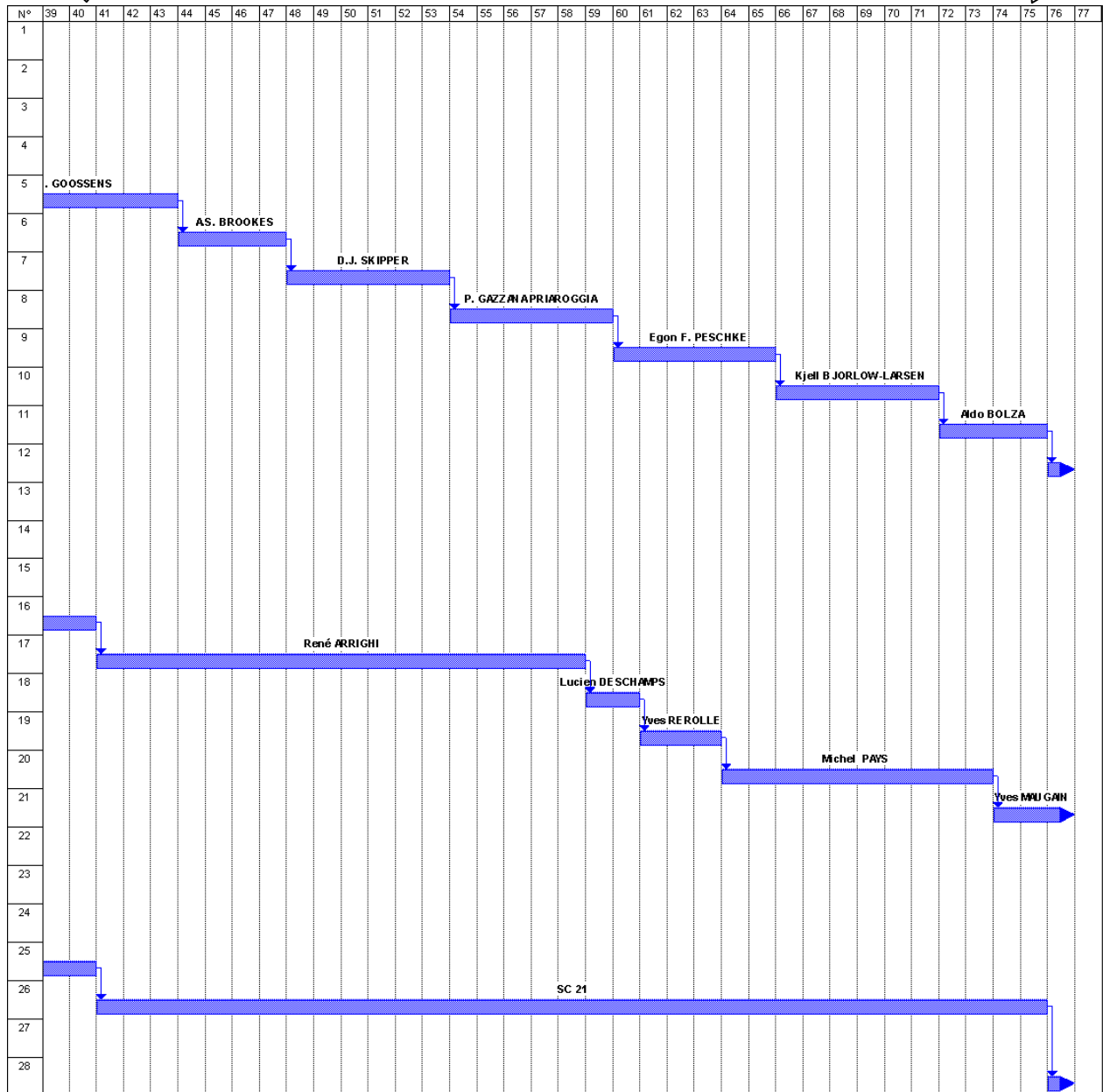
Legend:

- Top lines: Chairmen
- Intermediate lines: Secretaries
- Bottom lines: Study Committees

1967

SC 21 life: 1967 - 2002

2002



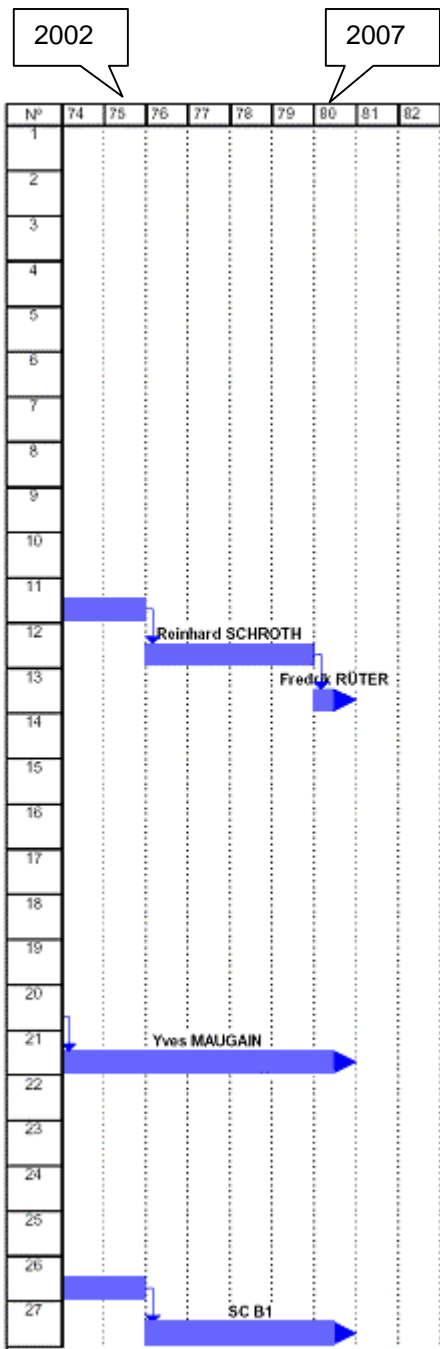
Legend:

Top lines: Chairmen

Intermediate lines: Secretaries

Bottom lines: Study Committees

SC B1 life: from 2003 to date



Legend:

- Top lines: Chairmen
- Intermediate lines: Secretaries
- Bottom lines: Study Committees

List of Working Groups between 1958 and 2007

| NUMBER | TITLE | CONVENOR | COUNTRY | DATES |
|-------------------------|--|---|----------------------------|-----------|
| WG 21/01 | DIRECT CURRENT CABLES (*) | BJURSTRÖM (1958-1975) ZANELLI (1976-1978) LUONI (1979-1985) | SE IT IT | 1958-1985 |
| WG 21/02 | CABLE RATINGS | PARR | UK | 1959-1985 |
| WG 21/04 | LOSS FACTOR IN OIL FILLED CABLES | JOHNSEN | NO | 1960-1967 |
| WG 21/05 | ANTI CORROSION PROTECTIVE COVERINGS | SUTTON (1960-1970) ENDACOTT (1971-1978) ARKELL (1979-1986) | UK UK UK | 1960-1967 |
| WG 21/03 | PARTIAL DISCHARGES IN CABLES | KREUGER | NL | 1962-1976 |
| WG 21/06 | AC and DC SUBMARINE CABLES (*) | GAZZANA (1965-1970) BJURSTRÖM (1972-1975) BOSSI (1976-1986) | IT SE IT | 1965-1986 |
| WG 21/07 | SPECIALLY BONDED SYSTEMS | E.H. BALL | UK | 1969-1988 |
| WG 21/09 | AC CABLES WITH EXTRUDED INSULATION | LACOSTE (1972-1977) DESCHAMPS (1978-1985) | FR FR | 1972-1985 |
| WG 21/08 | FORCED COOLING PROBLEMS | BLODGETT (1972-1974) D. PURNHAGEN (1975-1978) THELWELL (1979) MORELLO (1980-1985) LUONI (1985-1990) | USA IT IT | 1972-1990 |
| WG 21/10 | FAULT STATISTICS | SKIPPER (1972-1981) FARNETTI (1982-1990) | UK IT | 1972-1990 |
| WG 21/11 | WATERTREEING PHENOMENONS | KREUGER (1975) WIERSMA (1976-1978) LARSEN (1979-1990) VAN DE LAAR STEENIS (1990-1993) | NL NL NO NL NL | 1975-1993 |
| WG 21/12 | COMPRESSED GAS INSULATED CABLES | COOKSON (1978-1988) | US | 1978-1988 |
| WG 21/13 | FUTURE TRANSMISSION TECHNIQUES | DESCHAMPS | FR | 1982-1987 |
| TF 21.09/02 | TESTS OF HIGH VOLTAGE CABLES WITH EXTRUDED SYNTHETIC INSULATION | AUCLAIR PAYS | FR FR | 1985-1990 |
| WG 21/02 A | EFFECT OF MOISTURE MIGRATION IN THE GROUND | HOLTE | NO | 1985-1990 |
| WG 21/09 A | TESTS OF HIGH VOLTAGE CABLES WITH EXTRUDED SYNTHETIC INSULATION | AUCLAIR PAYS | FR FR | 1985-1990 |
| WG 21/14 | LAMINATED PROTECTIVE COVERING FOR HV CABLES WITH SYNTHETIC INSULATION | FURUSAWA | JP | 1986-1991 |
| WG 21/15 | AVAILABILITY AND RELIABILITY OF SUBMARINE CABLES | MORRIS | UK | 1988-1990 |
| WG 21/01 A | CABLE LAYING AND INSTALLATION | SCHUPPE | DE | 1989-1996 |
| WG 21/03 A | TESTS ON CABLES WITH EXTRUDED INSULATION AND ACCESSORIES : VOLTAGES RANGING FROM 170 TO 420 kV | SCHROTH | DE | 1990-1995 |
| WG 21/09 B | AFTER LAYING TESTS FOR CABLE SYSTEMS | PAYS (1989-1991) BECKER (1991-1996) | FR BE | 1990-1996 |
| WG 21/04 A | ELECTRICAL DESIGN BASIS FOR CABLES WITH EXTRUDED DIELECTRICS | LUONI ? | IT | 1991-1995 |
| WG 21/06 A | ACCESSORIES FOR HV CABLES WITH EXTRUDED INSULATION | IWATA | JP | 1991-1995 |
| WG 21/07 A | PROTECTION OF HV CABLES AGAINST TERMITE ATTACK | ARKELL | UK | 1991-1995 |
| WG 21/05 A | DIAGNOSTIC METHODS FOR SERVICE AGED CABLES | BOONE | NL | 1991-1996 |
| JWG 21/22.01 | CHARACTERISTICS OF OVERHEAD LINES AND UNDERGROUND CABLES | MAC MAHON | IE | 1992-1996 |
| WG 21/02 B | TESTS FOR HVDC CABLE SYSTEMS AND HVAC SUBMARINE CABLES WITH EXTRUDED INSULATION | DRUGGE | SE | 1993-1998 |
| JWG 21/33 | INSULATION COORDINATION FOR HV AC UNDERGROUND CABLE SYSTEMS | ROSEVEAR | UK | 1995-1998 |
| WG 21/03 A, TF 21/18 | TESTS ON CABLES WITH EXTRUDED INSULATION AND ACCESSORIES : Extension to 500 kV | SCHROTH | DE | 1996-1997 |
| WG 21/16 | PARTIAL DISCHARGE DETECTION IN INSTALLED HV EXTRUDED CABLE SYSTEMS | BOONE | NL | 1996-2000 |
| WG 21/17 | LAYING AND INSTALLATION TECHNIQUES FOR HV UNDERGROUND CABLE SYSTEMS | MAUGAIN | FR | 1996-2000 |
| JWG 23/21/33.15 | GAS INSULATED LINES | SABOT | FR | 1997-2002 |
| JTF 23/12/13/21/22/.16 | GUIDELINES FOR THE COLLECTION AND HANDLING OF RELIABILITY DATA | DESQUILBET | FR | 1998-2001 |
| JTF 21/15 | INTERFACES BETWEEN HV EXTRUDED CABLES AND ACCESSORIES | GEENE | NL | 1998-2002 |
| TF 21/05 | EXPERIENCES ON AC AFTER LAYING TESTS | VAN SCHAIK | NL | 1998-2002 |
| WG 21/18 | SPECIAL BONDING OF HV CABLES (Power frequency) | BUCKWEITZ (1998-2000) AWAD (2000-2003) | US CA | 1998-2004 |
| TF B1-13 | SPECIAL BONDING OF HV CABLES (Transitory) | AWAD (2003-2004) | CA | |

| NUMBER | TITLE | CONVENOR | COUNTRY | DATES |
|-----------------------------|---|--|----------|-----------|
| WG 21/01 B | RECOMMENDATIONS FOR TESTING DC EXTRUDED CABLE SYSTEMS FOR POWER TRANSMISSION | RÜTER | SE | 1999-2002 |
| WG 21/20 | HIGH TEMPERATURE SUPERCONDUCTING CABLES | NORMAN (1999-2000) NASSI (2000-2002) | UK IT | 1999-2002 |
| WG 21/19 | TECHNICAL AND ENVIRONMENTAL ISSUES REGARDING THE INTEGRATION OF HV UNDERGROUND CABLE SYSTEMS IN THE NETWORK | ARGAUT | FR | 1999-2003 |
| WG B1/19 | TECHNICAL AND ENVIRONMENTAL ISSUES REGARDING THE INTEGRATION OF HV UNDERGROUND CABLE SYSTEMS IN THE NETWORK | ARGAUT | FR | 1999-2003 |
| WG B1/02 | THERMAL MONITORING OF UNDERGROUND HV CABLE SYSTEMS | ROSEVEAR | UK | 2000-2003 |
| TF B1/10 | THERMAL RATING OF HV ACCESSORIES | SCHROTH (2001-2002) GEENE (2002-2003) | DE NL | 2001-2003 |
| TF B1/16 | REVIEW OF RECOMMENDATIONS FOR TESTS OF POWER TRANSMISSION DC CABLES FOR A RATED VOLTAGE UP TO 800 kV | EVENSET | NO | 2003-2004 |
| WG B1/03 | LARGE CONDUCTORS AND COMPOSITE SCREENS | DORISON | FR | 2001-2004 |
| WG B1/04 | MAINTENANCE OF HVAC UNDERGROUND CABLES AND ACCESSORIES | BOONE | NL | 2001-2004 |
| WG B1/05 | TRANSIENTS AFFECTING LONG CABLES | BALOG | NO | 2001-2004 |
| WG B1/06 | REVISION OF QUALIFICATION PROCEDURES FOR EXTRUDED HVAC UNDERGROUND CABLE SYSTEMS | BECKER | BE | 2002-2005 |
| WG B1/07 | STATISTICS ON UNDERGROUND CABLE IN TRANSMISSION NETWORKS | SWINGLER | UK | 2003-2006 |
| WG B1/08 | CABLE SYSTEMS IN MULTIPURPOSE OR SHARED STRUCTURES | BARBER | AU | 2004-2007 |
| WG B1/09 | REMAINING LIFE OF EXISTING HV AC UNDERGROUND LINES | BOONE | NL | 2004-2007 |
| WG B1/10 | UPDATE OF SERVICE EXPERIENCE ON UNDERGROUND AND SUBMARINE CABLES | ROSEVEAR | UK | 2004-2007 |
| WG B1/11 | UPGRADING AND URATING OF EXISTING CABLE SYSTEMS | LESUR | FR | 2004-2007 |
| WG B1.21 | THIRD PARTY DAMAGES ON UNDERGROUND AND SUBMARINE CABLES | JENSEN | DK | 2005-2008 |
| WG B1.22 | CABLE ACCESSORIES WORKMANSHIP | LEEBURN | ZA | 2005-2008 |
| WG B1.23 | IMPACT OF EMF ON CURRENT RATINGS AND CABLE SYSTEMS | ORTON | CA | 2006-2009 |
| WG B1.24 | TEST PROCEDURES FOR HV TRANSITION JOINTS | MARELLI | IT | 2006-2009 |
| WG B1.25 | ADVANCED DESIGN OF LAMINATED METALLIC COVERINGS | MIREBEAU | FR | 2006-2009 |
| WG B1.26 | EARTH POTENTIAL RISES IN SPECIALLY BONDED SCREEN SYSTEMS | DORISON | FR | 2005-2007 |
| JTF 15/12/13/14/21/23/37 | ADVISORY REPORT ON THE CIGRE STRATEGY REGARDING HTS MATERIALS | | | |
| JTF 36/21-01 | MAGNETIC FIELD CALCULATION IN UNDERGROUND CABLE SYSTEMS | VERITE | FR | |
| JWG 33/21/14-16 | OVERVOLTAGES ON HVDC CABLES | | | |
| SC 11 | ROTATING MACHINES COMMITTEE | | | |
| SC 15 | MATERIALS FOR ELECTROTECHNOLOGY COMMITTEE | | | |
| SC 21 | HIGH VOLTAGE INSULATED CABLES STUDY COMMITTEE | | | |
| SC B1 | INSULATED CABLES STUDY COMMITTEE | | | |
| SC 33 | POWER SYSTEM INSULATION COORDINATION COMMITTEE | | | |
| SC 36 | POWER SYSTEM ELECTROMAGNETIC COMPATIBILITY COMMITTEE | | | |
| TF 38/01/11 | SUPERCONDUCTING CABLES - IMPACT ON NETWORK STRUCTURE AND CONTROL | | | |
| WG D1.33 | HIGH VOLTAGE MEASURING TECHNIQUES | | | |
| WG 36/01 | ELECTRIC AND MAGNETIC FIELDS PRODUCED BY TRANSMISSION SYSTEMS | | | |
| AORC-B1 | Asia-Oceania Regional Council Panel on Insulated cables | BARBER | AU | |
| WG 36/02 | GUIDE ON THE INFLUENCE OF HIGH VOLTAGE AC POWER SYSTEMS ON METALLIC PIPELINES | | | |

COMMENTS (*) Merged with WG 21-06 from 1972 to 1975

In 1972, the working groups on DC cables and submarine cables which had the same convenor, merged.

This situation lasted up to Mr BJUSTRÖM retirement. Then the joint WG was split again into two separate WGs.

It has to be noticed that Joint Working Groups and Joint Task Forces are not mentioned here even if their respective contributions were important, as the records were not so complete as for the full SC groups.

5 Production

From 1969 to 2007, more or less the duration of SC 21 (1968-2002) and 5 years of existence of SC B1, the said Working Groups produced more than 110 documents. This important contribution to the cable system knowledge and the Cigre recognition should be considered as an important input to the Electric Power Industry.

An other document named "White Book" analyses these contributions deeper.