



## 2009 Activity Report

### Study Committee B4

#### 1. Highlights

The HVDC market is very busy with lots of project activity, and the rapid development of technology. The LCC HVDC technology has now reached 800kVdc, giving power ratings for bipoles at up to 8GW. The VSC HVDC technology is being applied at  $\pm 200$ kVdc, at power up to 500MW, and new lower power loss converters are reaching the market place, opening up additional project opportunities.

The FACTS market is also buoyant, with many SVC and STATCOM projects being implemented to support the transmission from remote wind farms. Similarly, to enable larger power flow across AC transmission lines, series compensation, such as TCSC and other FACTS devices are finding more applications.

SC B4 has a major role in providing unbiased and up to date application guides for the implementation of these types of projects. SC B4 also has a major role in the provision of unbiased and up to date technical information to support the standardisation required for the testing of new technology solutions, and to enable HVDC Grids to be developed in a way such that different manufacturers can provide equipment for the Grid, and to avoid or minimise the need for equipment being replaced, as the Grid evolves. SC B4 also need to provide environmental information concerning the HVDC converter stations and FACTS installations, and to work together with other CIGRE SCs to ensure that the environmental impact of transmission lines and cables take into account the special characteristics associated with the direct voltage and current, as well as the harmonics, which may flow on these lines and cables.

The SC B4 secretary, Dr Mohamed Zavahir, decided to resign from his position early 2010, due to his excessive workload. The new SC B4 secretary is Stig Nilsson, who was the US RM. A new RM from US, Dr Hamid Elahi, has been identified, and will formally assume this position at the end of the 2010 CIGRE session.

#### 2. Working group changes since the last TC meeting :

- a. The following new WG has been approved
  1. JWG C4-C1-B4/604 Influence of Embedded HVDC Transmission on System Security and AC Network Performance
- b. WG Disbanded
  1. JWGA2-B4/28 HVDC Converter Transformers
  2. WG B4.45, Technological Assessment of 800kv HVDC Applications
- c. Total number of WGs (end of March 2010)
  1. 8 Active WGs plus 2 Advisory Groups

#### 3. Publications

- a. Publications since the last TC meeting (April 2009)
  1. TB 370 Integration of Large Scale Wind generation using HVDC and Power Electronics.



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2. TB 371 Static Synchronous Series Compensators (SSSC)
  3. TB 388 -- Impacts of HVDC Lines on the Economics of HVDC Projects
  4. TB 406 HVDC Converter Transformers, Design Review, Test Procedures, Ageing Evaluation and Reliability in Service
  5. TB 407 HVDC Converter Transformers, Guidelines for Conducting Design Reviews, also Electra paper
- Note that summaries have also been published in Electra for these documents.

- b. Publication plan for the coming year
  1. WG B4.45 has submitted an Elektra summary and the full TB for publication.
  2. It is expected that WG B4.38, WG B4.44 and WG B4.47 will complete their activities during the coming years, and will publish Elektra papers and Technical Brochures.

#### 4. Tutorials and workshops in 2009

A tutorial was held in conjunction with the SC B4 meeting in Bergen, Norway.

#### 5. Strategic Plan and Action Plan :

The Strategic Plan has been rewritten according to the new format and has been approved by the B4 Regular Members. The plan is valid for the period 2010 to 2020, but will be reviewed and updated no later than 2015

The draft SC B4 Action Plan has been completed and is currently being reviewed by SC B4 AG01 and the RMs, prior to finalisation and issue. The Action Plan will be reviewed and revised every 2 years.

#### 6. Planned SC meetings

The next SC B4 meeting will be held on the 27<sup>th</sup> August 2009, in Paris.

The 2011 SC B4 meeting will be held in Melbourne and Brisbane Australia, October 15-22, 2011.

#### 7. Participation to Regional Meetings, colloquia and symposia :

- a. In 2009
  1. B4 was represented at the joint IEC/Cigre UHV Transmission Seminar held in Delhi, India in January 2009
  2. B4 participated in the EMF Colloquium in Sarajevo in June 2009.
- b. In 2010 and beyond
  1. The Chairman will represent SC B4 at the IET HVDC conference in London 20<sup>th</sup>/21<sup>st</sup> October 2010, where he will give a keynote speech
  2. No other activities are planned at this stage



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### 8. Relations with other organisations

B4 AG01 now has a member from China who is also involved with the management of the new IEC TC615. However, the hoped for improved interaction has not materialised.

B4 hopes to improve its relationship with IEC SC 22F and IEC TC615, and will continue to try to get responses from these organisations.

The JICCG meetings no longer takes places, as the group has served its intended purpose.

In spite of efforts having been made to open stronger communication with the IEEE, no significant progress has been made.

### 9. Specific actions for the recruitment of young experts

SC B4 RMs and WG convenors have been made aware of the need to attract younger members into CIGRE activities. The WG on HVDC grids has attracted a large membership, which includes several young members. No other successes can be reported.

### 10. SC website : on-line contents and date of last update

The B4 Website has been maintained by the Webmaster Narinder Dhaliwal. B4 has the desire to make its website a natural first call when anyone is interested in knowing the latest information about HVDC and Power Electronics in networks, and some progress has been made on writing contents describing HVDC and FACTS technology and applications. However, because of the large volume of work for anyone involved with HVDC and FACTS very limited effort is available to make rapid progress. The website rules and storage capacity also impose a number of significant constraints. The B4 aspiration to make the website more dynamic and attractive remains a long term objective.

Page	Comments on updates	Latest modification
<a href="#">MEMBERSHIP</a>	Updated membership list	31 Mar 10
<a href="#">Contact</a>	Updated contact info.	30 Mar 10
<a href="#">Annual reports</a>	Added 2009 annual report.	4 Mar 10
<a href="#">TC Awards</a>	Updated Technical Awards List	17 Jan 10
<a href="#">Technical activities</a>	Updated Specification for Technical Brochure	17 Jan 10
<a href="#">Activities</a>	Updated AG01 Terms of Reference	1 Jan 10
<a href="#">Official SC documents</a>	Scope of Study Committees	1 Jan 10
<a href="#">Technical Brochures</a>	Update B4 Technical Brochure list	15 Nov 09
<a href="#">What is SC ?</a>	Added FACTS information	9 Nov 09
<a href="#">Cigre events</a>	Updated MOM from Norway and reports	17 Oct 09

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16<sup>th</sup> April 2010