



**ACTION PLAN  
OF  
CIGRE STUDY COMMITTEE B2:  
"OVERHEAD LINES"  
2008 –2009-2010**

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## **ACTION PLAN 2008-2009-2010**

**OF**

## **CIGRE STUDY COMMITTEE B2: "OVERHEAD LINES"**

**March 2008**

### **1 INTRODUCTION**

#### **1.1 PURPOSE OF THE DOCUMENT**

The purpose of this Action Plan is to describe the short term objectives and ambitions of CIGRE Study Committee B2 according to the long term objectives defined in the Strategic Plan. It is proposed to revise every year this Action Plan, taking in account work done (publications, tutorials,..) and SCB2 evolutions : disbanding and creation of WG.

#### **1.2 MISSION AND PRESENT FIELD OF ACTIVITIES**

For the next 3 years, SCB2 has to manage the new organization where WG are non permanent.

### **2 ORGANISATION AND COMPETENCIES : EXISTING Working Groups**

SCB2 is composed of Advisory Groups and WG , JWG.

- The Advisory Groups have in charge to Advise SC Chairman as far as Strategy, Customer needs, satisfaction and publications are concerned .
- 4 Working Groups are general : WGB2.06, WGB2.12, WGB2.13 and WGB2.16;
- 4 Working Groups are specialized : WGB2.03, WGB2.07, WGB2.08 and WGB2.11

These 8 WG are planned to be disbanded in 2007.

- 3 new groups are transverse : one with B4 and C1 on HVDC : JWGB2/B4/C1.17 , another with D2 on Geographic Information System : JTFB2/D2.18, and another one Increasing Capacity of OHL JWGB2/C1.19 with C1.
- 1 new TF is dealing with Management of risks due to load-flow capacity increases in Transmission Overhead Lines.



Number	Title	Scope of work	Years of creation and disbanding
AG.B2-SAG	Strategic Advisory Group	Adapt organisation, composition and working procedures of the Study Committee to the changing operating environment and develop proposals on strategic, policy and organisational matters	2004 permanent
AG. B2-CAG	Customer Advisory Group	Ensure that the needs of the Target Groups are fulfilled	2004 Permanent
AGB2.P&TAG	Publications & Tutorial Advisory Groups	Publications, Tutorials and Web Site	2004 Permanent
AGB2.EP	Electrical Performance	Ampacity of OHL, Electrical characteristics of conductors, short circuit withstanding,...	2007 Permanent
AGB2.TFI	Towers, Foundations & Insulators	Line equipments design and behaviour : Towers, foundations, Insulators	2007 Permanent
AGB2.MBCE	Mechanical Behaviour of Conductors and lines Equipments	Mechanical behaviour of conductors, ground wires, fittings such as joints, clamps, spacers, interphases spacers,...	2007 Permanent
AGB2.AM	Asset Management	Asset management : reliability, availability, weather & environment	2007 Permanent
WGB2.06	Principles of overhead line design	Methods to improve electrical and mechanical design of Overhead Line systems, including RBD (Reliability Based Design) methods, taking into account better knowledge of meteorological issues	1990 2007
WGB2.07	Foundations	Subsurface investigation, geotechnical and structural design of foundations including: the analysis of different reliability concepts (deterministic, probabilistic, semi-probabilistic), practical construction of the foundations and quality management (safety, feasibility, durability, environmental impact, construction equipment), foundation testing, cost analysis, damage and failure analysis, assessment inspection, maintenance and strengthening of foundations.	1995 2007



WGB2.08	Transmission Line Structures	Research, design and construction aspects of the OHL supports as well as the inspection and assessment methods of existing ones..	1994 2007
WGB2.11	Mechanical behaviour of conductors and fittings	Mechanical behaviour of overhead transmission line conductor and earthwire/fittings systems, including optical fibre cable/fittings systems, under both static and dynamic loads with a view to assisting transmission engineers in improving line protection and reliability (integrity).	1987 2007
WGB2.12	Electrical aspects of overhead lines	Study and evaluate problems and phenomena that originate in the line's electrical function, our goal being to define criteria and parameters for line design and power transfer rating	1991 2007
WGB2.13	Maintenance and Management of Existing Overhead Lines	Investigation on refurbishment or extended utilization of existing overhead transmission lines and guidelines for emergency resource planning for overhead transmission line asset owners	1994 2007
WGB2.16	Meteorology for overhead lines	Extreme weather affects severely overhead lines in many ways, both mechanically and electrically. Such influences result particularly from wind, icing and lightning. These topics will be covered from a meteorological point of view, as an interface between the engineering side and the current developments within the meteorological science.	2001 2007
JWGB2/B4/C1.17	IMPACTS OF HVDC LINES ON ECONOMICS OF HVDC PROJECTS	Evaluate the cost of HVDC typical lines and establish economical global evaluation with intermediate substations to supply AC systems (+ cost of losses, interest rate,...)	2004 2008
TFB2/D2.18	OVERHEAD LINES GEOGRAPHICAL AND ASSET INFORMATION SYSTEM	Geographical and asset management systems : own needs of companies, possible utilization, costs	2004 2006
WGB2/C1.19	INCREASING CAPACITY of OVERHEAD LINES-NEEDS AND SOLUTIONS	Common thoughts between C1 and B2 on Increasing Power Capacity of lines, while taking all aspects into account : Economics, technical feasibility, Security, Reliability, Operational Planning constrains, Maintenance...	2004 2007



TF B2.20	Management of risks due to load-flow capacity increases in Transmission Overhead Lines	The goal of this Task Force is to share expertise and exchange ideas to deal with the management of risks due to load-flow capacity increases in transmission overhead lines.	2005 2008
WGB2.21	Arc protection and diagnosis for composite string insulators	Evaluation of Composite Insulators in Service Power Arc Protection for Composite Insulators Strings	2007 2010
WGB2.22	Implementation of Overhead Line Design Principle	OHL design methods, including reliability, security, safety and continuity of service	2007 2010
WGB2.23	Geotechnical and structural design of the foundations of HV & UHV Lines	Geotechnical consequences of the support location in respect of foundation design Static and dynamic loading on foundations	2007 2010
WGB2.24	Performance of HV and UHV OHL supports	Techniques for upgrading supports or uprating projects. Maintenance, refurbishment and life extension techniques	2007 2010
WGB2.25	Cooperative work with IEC on specifications on Fittings, spacers and dampers	Contribution to the revision of existing IEC standards IEC 61824, 61854, 61897. ..	2007 2010
WGB2.26	Electrical & Thermal Aspects of Overhead Conductor Systems for MV to UHV OHL	A Guide to Evaluating and Accepting New Types of Overhead Conductor” Impact of High Temperature (>100oC) operation on conventional bare conductors, connectors, and hardware	2007 2010
WGB2.27	Live line maintenance : a management perspective.	What is required to implement and maintain an effective Live Line Program for existing HV, EHV and UHV assets. To describe cost effective transmission line design considerations for effective implementation of a Live Line Maintenance Program.	2007 2009
WGB2.28	Weather related impacts on HV and UHV overhead lines	implementation of meteorological knowledge, including observation systems, statistical methods and modelling concerning weather related parameters, on overhead line components.	2007 2010
WGB2.29	Anti- and de-icing systems for HV and	includes forecasting and monitoring of icing events, icing prevention (anti-icing) and de-	2007



	UHV overhead lines	icing (AI/DI) technologies	2009
WGB2.30	Engineering Guidelines relating to fatigue endurance capability of conductor/clamp systems	Engineering guidelines of practical use to transmission line designers and engineers on the fatigue endurance capabilities of conductor/clamping systems.	2007 2008
WGB2.31	Modelling of Aeolian Vibration of single conductors	Aeolian vibrations of single conductors strung at relatively high tensile load: modelling and correlation between laboratory and field tests. Application to HV & UHV lines	2007 2010
WGB2.32	Assessing the performance of aged fittings	Testing, acceptance criteria & recommendations for HV & UHV Lines.	2007 2010
WGB2.33	Guidelines for cable cart/trolley (cycling) safety	Guidelines for cable cart/trolley (cycling) safety on old conductors (earthwires) equipped with aircraft warning markers (and other fittings).	2007 2010
WGB2.34	Influence of Line Configuration on Environment Impacts of Electrical Origin for 800 and 1100 kV lines	Influence of Line Configuration on Environment Impacts of Electrical Origin for 800 and 1100 kV lines	2007 2010
WGB2.35	Behaviour of HV & UHV OHL supports under static & dynamic loads	Establish new procedures for qualification of towers under static loads with the help of numerical modelisation and behavior of OHL supports under dynamic loads on HV and UHV lines.	2007 2010
WGB2.36	Guide for Application of Direct real time monitoring systems on Overhead Transmission lines.	To identify and describe general requirements for direct real time capability monitoring systems for overhead transmission lines.	2007 2010
WGB2.37	Lightning damages to OPGW or OPPC conductors	The main aspects of this WG will be to gather evidence of OPGW or OPPC damage, to prepare recommendations for measurement and analysis of both lightning impulses and continuing currents associated with OPGW or OPPC damage by lightning and to prescribe the fundamental components of laboratory tests to evaluate OPGW or OPPC designs.	2007 2009



### 3 CHANGES TO THE OPERATION OF THE STUDY COMMITTEE

In line with the new rules of Study Committees, the working groups cannot exist for longer than 4 years. The main reason for this is to improve the output of the working groups and to adapt the Working group Activities to the needs of SCB2 Customers. As SCB2 has a number of groups that have a life of longer than 4 years, it was necessary to change the manner in which the WGs operate. The challenge was to ensure three main points:-

1. The productivity of the Study is to improve with no disruption of present tasks
2. The networking benefit realised with present groups is not to be disrupted
3. The continuity of documents and information is to be maintained.

The other problem was to avoid a large amount of working groups being generated with no chairman or secretaries to pick up the workload.

In order to fulfil these requirements, 3 procedures have been established and Advisory Groups created :

1. the introduction of new topics and creation of new WG : SCB2PROC\_05\_01
2. the publication of documents : SCB2PROC\_05\_03
3. the archiving of important WG documents : SCB2PROC\_06\_1.

The main purpose of Advisory Groups is to assist the Chairman and the SC in developing certain policies as well as assist in the determination of the Strategic direction etc...

A brief outline of their responsibility is:-

**Strategic Advisory Group** - to update and revise the strategic plan every on a 3 or 4 years basis for approval by the SC Chairman. This group will ensure that input is received from the Customer AG as well as the intentions of the Publications and tutorials WG.

#### **Customer Advisory Group**

**Customer needs** – The identified customers of the SC are as follows:-

- 1 –Top, Management, Executives
- 2- Commercial Groups: regulators, distributors, consumers
3. Technical Groups: equipment suppliers, consultants, grid planners
- 4- Asset group
- 5- Operators group
- 6 - Science and Education Group: universities, research institutes,
- 7- Public Group
- 8 - International Organizations: CIRED, IEEE, IEC

The purpose of this **Customer Advisory Group** is to obtain from various customer representatives in the SC, the main aspects that need to be addressed by the SC. This Group needs to provide guidance to the WG's as to possible new topics and focus areas for the



WG's. They are also to ensure that new topics are not already covered by other SC's. For topics proposed by individual members the group is to advise as to whether the topic should be pursued and by whom.

**Publications and Tutorials Advisory group** – This AG is to compile a comprehensive list of future publications based on input from all WG's. The group is to monitor the progress of the publications and ensure the review process is adhered to.

#### 4 ACTION PLAN 2006-2008

The following action plan outlines the main tasks of the working groups. The detailed action plan is to be found in APPENDIX

	technical action plan 2005-2008	responsible	Type of action & Schedule	Links
<b>SCB2.1</b>	Activity report of study committee B2 for 2005, 2006, 2007	Secretary	28/02/2006 20/02/2007 20/02/2008	
<b>SCB 2.2</b>	Up dating the action plans of Advisory Groups	AG Convenors	28/02/2006 20/02/2007 20/02/2008	Scb2 & wg's
<b>SCB 2.3</b>	update action plans of working groups	WG convenors	28/02/2006	Scb2 & Wg's

##### 4.1 WG B2.03 : Insulators (See [WG 03](#) )

The scope of WG B2.03 deals with Electrical and mechanical aspects of insulators used in overhead systems related to the assessment of their performance and reliability with a view to assisting transmission engineers in improving line protection and reliability (integrity)

A tutorial will be established on the handling of composite insulators.

**TB on Use of Corona rings to control the electrical field along transmission line composite insulators has been published in Electra October 2005 .**

The next reports or TB will cover the following subjects :

- TB on the **results of the evaluation of old insulators will be published in 2006.**
- TB :"**Guide for the establishment of naturally polluted insulator test stations**".

The detailed action plan of WG 03 is given in the appendix : [WG 03 : Action Plan](#)

The **needs** of Target Groups identified on insulators are the following :

1. the Assess the aging of Composite Insulators WG : how is it possible to detect composite insulators which are not safe ? A diagnosis method should be established within the next 4 years.
2. Are there any technical solutions to improve the behaviour of composite insulators subjected to short circuit arcs ?
3. In exceptional conditions, it may be necessary to protect insulators from fires : how is it possible ?
4. Guide for re-use of old insulators, especially those in emergency conditions.

**It is proposed a New WG B2.21** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### **4.2 WGB2.06 principles of overhead line design ( see [WG06](#))**

The WG B2.06 deals with methods to improve electrical and mechanical design of Overhead Line systems, including RBD (Reliability Based Design) methods, taking into account better knowledge of meteorological issues

The present objectives are focused on some of the following subjects:

- Comparison between new (or newly revised) probabilistic design methods IEC 60826, EN 50341 and ASCE 74 & Application examples of probabilistic design according to IEC 60826 and CIGRE TB 178 **publication scheduled in April 2006**
- Collection and comparison of information world-wide about upgrading of lines and review of design rules after severe wind and/or ice storms (2006).
- Mid span clearances : collection of word wide experience on criteria for minimum clearances between phase conductors and earth wires (2006)
- How OHL are re-designed after Uprating/Upgrading – Analysis of the answers to the Questionnaire (2006) : **publication scheduled in June 2006**
- OHL Response on HIW (High Intensity Winds) : (2007)
- Requirement for a “Generic specification for an ideal Load Reduction Device” to prevent extended line failures or cascades after extreme loads (SCB2 Web **publication scheduled in 2006**)
- 2 tutorials have been prepared :
  1. on Reliability Based Design according to IEC 60826 and TB 178 - Why you need it and how to use it (08/2004).
  2. on HSILL, and presented in BRASILIA ( September 2005).

Another one will be presented in Montreal May 2006 on “How Overhead Lines are Re-designed for Uprating/Upgrading “

The detailed action plan of WG 06 is given in the appendix : [WG06 : Action Plan](#)

The **needs** of Target Groups identified are the following :

1. Are the Standards adequate as far as Public Safety and Continuity of Service are concerned ?

2. Methods to assess the reliability of new line designs.
3. Methods to maximize reliability of lines
4. Effects of age of components on reliability of lines
5. Continuous improvement of (probabilistic) design methods, including security, safety and continuity of service.
6. Application example using RBD

**It is proposed a New WG B2.22** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### **4.3 WG B2.07 : foundations (see [WG07](#))**

The activity of WG07 covers the subsurface investigation, geotechnical and structural design of foundations including: the analysis of different reliability concepts (deterministic, probabilistic, semi-probabilistic), practical construction of the foundations and quality management (safety, feasibility, durability, environmental impact, construction equipment), foundation testing, cost analysis, damage and failure analysis, assessment inspection, maintenance and strengthening of foundations.

The present objectives are focused on some of the following subjects:

- Probabilistic design of Foundations (2006)
- Foundation installation ( 2006)
- Interaction between towers and foundations (2006)
- **a tutorial will be prepared on foundation design or on foundation installation.**

The detailed action plan of WG 07 is given in the appendix : [WG07 : Action Plan](#)

The **needs** of Target Groups identified are the following :

- The effect of Dynamic loading due to de-icing or wind galloping on foundations.
- New concept of foundation design and new techniques to lower cost.

**It is proposed a New WG B2.23** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**



#### 4.4 WG B2.08 : transmission structures (see [WG 08](#) )

The scope of work for WG08 covers the review and update the knowledge of OHL supports used in the existing lines and/or to be used for new lines. It comprehends research, design and construction aspects of the OHL supports as well as the inspection and assessment methods of existing ones. Innovative solutions and/or special supports for OHL crossings are also focused. Improving the mechanical reliability of the OHL supports is another essential issue to be dealt with. The impact of dynamic loads on the OHL supports strengths' has been an increasing concern and should be a topic for future studies.

The present objectives are focused on some of the following subjects:

- Towers for New Lines (2007)
- On the failure load of transmission line Steel towers considering uncertainties arising from Manufacturing & erection process (2006)
- Discrepancies between Predicted and Measured values of Load in Members of Towers during tests (2006)
- Improvement on the methodology of Tower Testing (2006)
- Large Overhead Lines crossings (2007)

-> a tutorial has been prepared on assessment of existing structures (08/2004)

The detailed action plan of WG 08 is given in the appendix : [WG 08 : Action Plan](#)

The **needs** of Target Groups identified are the following :

1. Endurance assessment of transmission line towers
2. Assessing the performance of support structures under dynamic loads
3. Techniques for Upgrading OHL Supports
4. Refurbishment & Life Extension Techniques for OHL Supports
5. Maintenance of towers ( Procedure of towers painting)
6. Use of composite materials for towers

**It is proposed a New WG B2.24** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### 4.5 WG B2.11 : Mechanical behaviour of conductor and fittings (see [WG 11](#) )

The scope of WG11 cover the investigation and reporting on, through tutorials, papers and guides, aspects of the mechanical behaviour of overhead transmission line conductor and earthwire/fittings systems, including optical fiber cable/fittings systems, under both static and dynamic loads with a view to assisting transmission engineers in improving line protection and reliability (integrity).

**-> 2 tutorials has been prepared : 1 on optical cables and fittings (08/2004) and a 2<sup>nd</sup> one on Safe design Tension with respect to Aeolian vibration for BRAZIL meeting in Sept 05. 1 tutorial on GALLOPING is proposed for future**

The present objectives are focused on some of the following subjects:

- **Aircraft Warning Markers** (publication ER scheduled in February 2006)
- **State of the Art Study of Galloping on Iced Conductors (TB 2006)**
- **Fatigue Endurance Capability of Conductor/Clamp Systems (TB 2007)** .

The detailed action plan of WG B2.11 is given in the appendix : [WG 11 : Action Plan](#)

The **needs** of Target Groups identified are the following :

1. Behavior and life duration of High temperature conductors and accessories
2. Assessing the performance of aged fittings : Testing, acceptance criteria & recommendations
3. Correlation of laboratory and field-testing of conductors (with different shapes of wires) without or with dampers, modelisation.

**It is proposed a New WG B2.25** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### **4.6 WG B2.12 : Electrical aspects of overhead transmission lines (see [WG 12](#))**

The scope of WG12 is to study and evaluate problems and phenomena that originate in the line's electrical function, our goal being to define criteria and parameters for line design and power transfer rating.

- -> 1 tutorials has been proposed on conductors for uprating OHL (2004/08)
- and another one is going to be prepared on thermal behaviour of Overhead conductors

The present objectives are focused on some of the following subjects :

- Guide to Sag-tension Calculations (TB 2006)
- Guide to Selection of Weather Conditions for Overhead Line Ratings (TB 2006)
- Calculation of AC Resistance for Bare Overhead Conductors" (TB 2006).

The detailed action plan of WG B2.12 is given in the appendix : [WG 12 : Action Plan](#)

The **needs** of Target Groups identified are the following :

- Methods whereby the power transfer capability of the line can be increased needs to be studied
- Methods to uprate the voltage of existing OHL
- Methods to remove power transfer constraints caused by Transmission lines
- Factors that limit the power transfer of lines need to be determined
- Ampacity measurements.
- Methods to reduce losses.
- How to perform different functions with OHL : e.g. transmitting data through OPPC and OPGW and problems due to lightning.



**It is proposed a New WG B2.26** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### **4.7 WG B2.13 : management of existing overhead lines (see [WG13](#))**

The scope of WG13 cover the investigation and reporting on refurbishment or extended utilization of existing overhead transmission lines and guidelines for emergency resource planning for overhead transmission line asset owners

1 tutorial has been presented on Management of Existing Overhead Transmission Lines (09/2003).

The present objectives are focused on some of the following subjects :

- Guidelines for Refurbishment or Extended Utilization of Existing Overhead Transmission Lines (TB 2006)

-

The detailed action plan of WG B2.13 is given in the appendix : [WG 13 : Action Plan](#)

The **needs** of Target Groups identified are the following :

- Describe all live line maintenance methods developed all over the world to modify existing lines towers, foundations, or to install new OPGW,....
- State of the art construction methods employed on OHL in order to lower their cost.
- State of the art acceptance procedures for commissioning of new OHL : point that needs to be checked when the line is handed over from the construction crew to maintenance company.

**It is proposed a New WG B2.27** deals with these needs whose TOR with a precise schedule will be established before **end of June 2006, discussed in July and submitted to TC in September 2006.**

#### **4.8 WG B2.16 “ meteorology for overhead lines” activities ( see [WG16](#))**

Extreme weather affects severely overhead lines in many ways, both mechanically and electrically. Such influences result particularly from wind, icing and lightning. Several working groups within SCB2 deal already with these effects. However, considering the many adverse and wide-spread weather impacts on electrical systems in many countries during recent years, as well as the general concerns about changes in global climate, including possible increases in high wind and icing frequencies, the SCB2 has expressed the interest of establishing a new WG to handle such topics from a meteorological point of view, as an interface between the engineering side and the current developments within the meteorological science.

1 tutorial on High Intensity wind has been presented in September 2004 during PARIS Cigre Meetings.



The present objectives are focused on some of the following subjects :

- Design wind speed calculations in local topography (TB 2006)
- Meteorological icing models, statistical models and topographical effects (TB 2006)
- Operating system for prediction and monitoring of icing events, anti-icing and de-icing technologies for overhead lines (TB 2006 ).

The detailed action plan of WG B2.16 is given in the appendix : [WG 16 : Action Plan](#)

The **needs** of Target Groups identified are the following :

1. Are representative climatic data available and are the weather assumptions valid?
2. Determine guidelines for rational dynamic high intensity wind loading models for each characteristic type of extreme windstorm gust generic type events.
3. Determine design guidelines for evaluation of the structural design of lattice tower structures under dynamic wind loadings.
4. Determine guidelines for the design of tower footings under cyclic and translation loadings due to high intensity wind gusts.
5. Prepare and publish an international overhead line design guideline for regional high intensity winds that will provide a basis for the enhancement of reliability of overhead line design.

**It is proposed a New WG B2.28**, working in close cooperation with experts from WG on towers, foundations and Reliability design, deals with these needs whose TOR with a precise schedule will be established before **end of June, discussed in July and submitted to TC in September 2006.**

#### **4.9 SCB2 WG17 /B4/C1 “IMPACTS OF HVDC LINES ON ECONOMICS OF HVDC PROJECTS” (See Action Plan [JWG B2.17/B4/C1](#))**

The use of HVDC technology is increasing with the use of IGBT's and other such high speed, relatively low cost technology equipment. This has made DC technology an option for lower voltages as well as for higher voltages. The issues such as T-offs (Intermediate substations for supplying loads or AC systems) and fault level requirements as well as cost of terminal equipment have been addressed to a certain extent in many cases. In determining the technology to be used for different power transfer operations, it is necessary to determine the cost of the terminal equipment as well as the line linking the terminals. The determination of the HVDC system as a whole (Converter Stations plus Transmission Line) may prove more adequate than the investigation of the terminal equipment only.

The present objectives are focused on some of the following subjects :

- evaluate the cost of HVDC typical lines and establish economical global evaluation with intermediate substations to supply AC systems (+ cost of losses, interest rate,...)

- and publish in 2008 a Technical Brochure giving basic electric and mechanical performance of HVDC system ( Transmission Lines + Converter stations) with economical cost evaluation.

#### **4.10 SCB2 TF18 : OVERHEAD LINES GEOGRAPHICAL AND ASSET INFORMATION SYSTEM (See [SCB2-TF 18 /D2](#) )**

The development of Information System, as far as Geographical and asset management systems are concerned, is very large and is an important issue for Transmission Companies. The WG would answer to these questions :

- Is sharing of geographical data a necessity among Transmission and Distribution Companies or even with other utilities ( Telecommunication, Transport, gas... ) in order to get a better acceptance of overhead lines)
- What are the own needs of a Transmission Company in term of geo-referenced information : Asset management, Work management (maintenance, vegetation survey, refurbishment of OHL, reinforcement, emergency operation ) ?
- Which data for what purpose? According to which format ?- possible utilization of geographical information system (Use of Numerical model of terrain, satellite image, ..)
- geomatic : perspectives of developments,
- Data recording of HV Lines by means of helicopter or drones and laser survey, data processing and storing ...

The work of this task force will be presented at PARIS session in 2006.

#### **4.11 SCB2 WG 19 : INCREASING CAPACITY of OVERHEAD LINES-NEEDS AND SOLUTIONS (See [SCB2-JWG19/C1](#) )**

Electric Utilities now face increasing pressure to avoid new transmission lines while reregulation and the increase of electricity use worldwide require either additional corridors and/or the need to drive existing systems closer to their technical limits. Both electricity researchers and manufacturers seek solutions to this problem and are focused on many new methodologies or technologies aiming at bringing some solutions for the system planners to optimize the use of existing lines and equipments. The main advances in OHL technologies presented at the last SC B2 general session that can be used for this purpose are for instance :

- high temperature conductors and optimized conductors,
- sag compensators,
- means for up grading lines (increase of voltage)
- use of probabilistic ampacity calculation,
- real time monitoring and thermal rating,
- new methods of monitoring and calculation which may be used to improve capacity



- rated line reliability,

Whichever technology is chosen, discussions between Planners / Operational Engineers on one side and Researcher / Manufacturers on the other side show that all parties do not communicate enough. Security, reliability and economical aspects make planners skeptical towards Researchers / Manufacturers who on the other side, do not always clearly know the full range of constraints and concerns shared by planners and systems operators. The purpose of this new JWG would be to gather both planners (SC C1) and OHL specialists (SCB2) and make them share some common thoughts on Increasing Power Capacity of lines, while taking all aspects into account : Economics, technical feasibility, Security, Reliability, Operational Planning constrains, Maintenance...

Results of this WG would be given in 2007 :

- To identify state of the art solutions in a summary as far as the technology is concerned ;
- To classify all proposed solutions made by system planning operators according to their economical and electrical system interests ;
- A list of all advantages and disadvantages of these solution seen from each different parties and experts ;
- A description by planners of their medium term problems and needs which could form a 10 year ahead roadmap for designers, manufacturers and Researchers.

#### **4.12 MANAGEMENT OF RISKS DUE TO LOAD-FLOW CAPACITY INCREASES IN TRANSMISSION OVERHEAD LINES (see [TF B2.20](#))**

The forecast for increased growth in demand for electricity over the next few years urgently requires Transmission System Operators to take opportune action. Moreover, it is already difficult to build new overhead lines or substations, because of environmental constraints and public opinion.

In this context, increasing the load-flow capacity in existing transmission lines is seen as a valid alternative. Nevertheless, the current uprating of overhead lines could not be realized without risk management (safety, components lifespan and exploitation, economical and environmental constraints).

The goal of this Task Force could be to share expertise and exchange ideas to deal with the management of risks due to load-flow capacity increases in transmission overhead lines.

The main tasks could be :

identification as most as possible of risks scenarii due to load-flow capacity increases, with their descriptions and interactions (cause/effect diagram); the objective is to take into account impact towards safety, impact towards equipment lifespan (acceleration of the ageing due to uprating), impact on environment (electromagnetic field, noise...), impact towards transmission network exploitation (maintenance, refurbishment, availability...),...

evaluation of their consequences: this step permits to assess the likelihood and gravities of each risk, thanks to simulation of physical phenomena (for example : joint life prediction model, thermal rating calculations at elevated conductor temperature,...), experience feedback and engineering judgement; after that, we can build a global risk management process with bayesian networks (probabilistic approach), classification of risks scenarii : risk map is the method used as support for decision making,



estimation of solution impacts to treat them (for example : re-tensioning the conductors, ...). The components of overhead lines, that we plan to consider, are conductors, joints, earth wires and accessories (clamp, jumper, damper, conductor spacer, insulators, ...).

June 2008: Publication of the Complete study (risks network + treatments)



## 5 APPENDIX 1 : ADG & WG Terms of references & Action Plans :

### Strategic Advisory Group

Study Committee No : B2

WORKING BODY\* FORM

<b>Group No : B2-SAG</b>	<b>Name of Convener : B. DALLE</b>
<b>TITLE of the Group : B2-Strategic Advisory Group</b>	
<b>Scope, deliverables and proposed time schedule of the Group :</b>	
<ul style="list-style-type: none"><li>● A permanent Strategic Advisory Group (SAG) was launched, which terms of reference are to consider the strategic items of the SC : SAG will revise and prepare<ul style="list-style-type: none"><li>○ the Strategic Direction report annually for the approval of the SC chairman in time for the presentation to the Technical committee. This will be done in consultation with the other AG's as well as SC members.</li></ul></li><li>● The accountabilities of the Strategic advisory group will basically be:<ul style="list-style-type: none"><li>○ to ensure an optimal adaptation of the organisation, composition and working procedures of the Study Committee to the changing operating environment</li><li>○ to develop proposals on strategic, policy and organisational matters</li><li>○ to suggest contributions/presentations by SC members and working groups for events</li><li>○ to regularly update the committee's strategic plan</li><li>○ to identify and discuss with stakeholders opportunities for the organisation of colloquia, the participation in CIGRE regional meetings and the co-operation with other international organisations in the field of Overheadlines</li><li>○ to promote the international appearance of the study committee in general.</li></ul></li><li>● It is composed of X members: the Chairman, who will convene, the SC Secretary, the convenors of other AG and other SC Members, all chosen by the Chairman.</li></ul> <p>The SAG will meet at least once a year.</p>	
<u>The SAG will consider in the future any other strategic item whenever necessary or appropriate.</u>	
<b>Created:</b> 2004, <b>Duration:</b> permanent	
<b>Convener e-mail:</b> <a href="mailto:bernard-michel.dalle@edf.fr">bernard-michel.dalle@edf.fr</a>	

**Countries represented:** AUSTRALIA, BELGIUM, CANADA, DENMARK, FRANCE, GREECE, IRELAND, SOUTH AFRICA, UNITED KINGDOM, UNITED STATES.



Study Committee No : B2

ACTION PLAN – 2007– 2008

<b>Group No : B2-SAG</b>	<b>Name of Convener : B. DALLE</b>
<b>TITLE of the Group : B2-Strategic Advisory Group</b>	
<b>Edition of the action Plan : 17/02/05</b>	
<b>Scope, deliverables and proposed time schedule of the Group :</b>	
<ul style="list-style-type: none"><li>○ the Strategic Direction report annually : <b>each 5<sup>th</sup> March 2007 &amp; 2008</b></li><li>● The accountabilities of the Strategic advisory group will basically be:<ul style="list-style-type: none"><li>○ to ensure an optimal adaptation of the organisation, composition and working procedures of the Study Committee to the changing operating environment</li><li>○ to develop proposals on strategic, policy and organisational matters</li><li>○ to suggest contributions/presentations by SC members and working groups for events</li><li>○ to regularly update the committee's strategic plan : when necessary and at least every 2 years</li><li>○ to identify and discuss with stakeholders opportunities for the organisation of colloquia, the participation in CIGRE regional meetings and the co-operation with other international organisations in the field of Overhead lines</li><li>○ to promote the international appearance of the study committee in general.</li></ul></li></ul>	
<u>Subjects of present considerations are:</u>	
<ul style="list-style-type: none"><li>● Prepare and Edit the New SCB2 Strategic Plan every 2 years : next June 2008</li><li>● Discuss the Proposition of New Activities for new WG : July 2007 and August 2008</li><li>● Propose New WG Terms of References for 2007-2010 to TC : Permanent work</li></ul>	
<u>The SAG will consider in the future any other strategic item whenever necessary or appropriate.</u>	
<b>Created:</b> 2004, <b>Duration:</b> permanent	
<b>Convener e-mail:</b> <a href="mailto:bernard-michel.dalle@edf.fr">bernard-michel.dalle@edf.fr</a>	

**Countries represented:** AUSTRALIA, BELGIUM, CANADA, DENMARK, FRANCE, GREECE, IRELAND, SOUTH AFRICA, UNITED KINGDOM, UNITED STATES,

**Approval by SCB2 Chairman :B. DALLE**

**Date : April 2007, 16<sup>th</sup>**



## Customer Advisory Group

Study Committee No : B2

### 5.1.1

#### WORKING BODY\* FORM

<b>Group No : B2 - CAG</b>	<b>Name of Convener : STEPHEN Rob</b>
<b>TITLE of the Group : B2- Customer Advisory Group</b>	
<b>Scope:</b> A permanent Customer Advisory Group is installed in SC B2 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 B2-CAG will be the working body within SC B2 to co-ordinate all activities in this field. It will work in close contact with the SC Chairman and the Strategic Advisory Group B2-SAG and will include all SC B2 members as contacts and interfaces to their national or local customers. The Terms of Reference (ToR) of the B2-CAG are as follows: <b>1. Identification of Target Group</b> <ul style="list-style-type: none"><li>- systematically identify SC B2's Target Groups in different countries</li><li>- listing of respective organizations, persons, social groups, etc.</li><li>- analyzing the organizational levels and hierarchies</li><li>- identifying of most important and influential addressees</li></ul> <b>2. Active communication with TGs</b> <ul style="list-style-type: none"><li>- develop systematic and effective concepts for active contacts and communication</li><li>- implement sustainable communication links between organizations and persons</li><li>- effectively disseminate B2's activities and outcomes to TGs</li><li>- propose appropriate presentations (Paris Session, Tutorials, Symposia, etc.)</li></ul> <b>3. Collection and mapping of TG's needs</b> <ul style="list-style-type: none"><li>- identify problems and needs of TGs</li><li>- map systematically needs of TGs</li><li>- proposals for revision of current SC B2 activities with regard to needs of TGs</li></ul> <b>4. Collection and evaluation of feed-back from TGs</b> <ul style="list-style-type: none"><li>- collect and map the degree of TG's satisfaction</li><li>- evaluate the findings and derive, if necessary, measures for improvements and new actions</li><li>- identify opportunities to increase TG's satisfaction</li><li>- coordinate activities at national level where appropriate</li></ul> <b>5. Proposition of New activities</b> leading eventually to the creation of new Working groups with their terms of references.	
<b>Deliverables:</b> B2-CAG will present their findings regularly to the SC, at least twice a year as all the other working bodies or additionally whenever appropriate.	
<b>Created:</b> 2004, <b>Duration :</b> permanent	
<b>Convener e-mail:</b> stepherg@eskom.co.za	
<b>Countries represented :</b> At least one representative from each continent	
<b>Approval by SCB2 Chairman : B.DALLE</b>	<b>Date : 2007, April 16<sup>th</sup></b>



## Customer Advisory Group : ACTION PLAN

<b>Group No : B2 - CAG</b>	<b>Name of Convener : Rob STEPHEN</b>
<b>TITLE of the Group : B2- Customer Advisory Group</b>	
<p><b>1. Identification of Target Group</b></p> <ul style="list-style-type: none"><li>- systematically identify SC B2's Target Groups in different countries</li><li>- listing of respective organizations, persons, social groups, etc.</li><li>- analyzing the organizational levels and hierarchies</li><li>- identifying of most important and influential addressees</li></ul> <p>ex : List of links between SCB 2 and normalization bodies and main demands : <b>Sept 07</b></p> <p><b>2. Active communication with TGs</b></p> <ul style="list-style-type: none"><li>- develop systematic and effective concepts for active contacts and communication</li><li>- implement sustainable communication links between organizations and persons</li><li>- effectively disseminate B2's activities and outcomes to TGs</li></ul> <p><b>3. Collection and mapping of TG's needs</b></p> <ul style="list-style-type: none"><li>- identify problems and needs of TGs</li><li>- map systematically needs of TGs</li><li>- proposals for revision of current SC B2 activities with regard to needs of TGs</li><li>- <b>ex : Update TARGETS group analysis for SCB2 : November 2007</b></li></ul> <p><b>4. Collection and evaluation of feed-back from TGs</b></p> <ul style="list-style-type: none"><li>- collect and map the degree of TG's satisfaction</li><li>- evaluate the findings and derive, if necessary, measures for improvements and new actions</li><li>- identify opportunities to increase TG's satisfaction</li><li>- coordinate activities at national level where appropriate</li></ul> <p><b>5. Proposition of New activities</b> leading eventually to the creation of new Working groups with their terms of references.</p> <ul style="list-style-type: none"><li>- Analysis of New WG future activities according to the needs of TG and propositions of New WG bodies with their TOR (permanent)</li></ul>	
<b>Countries represented:</b> BELGIUM, BRAZIL, CANADA, CZECH REP., FRANCE, ISRAEL, SOUTH AFRICA, SPAIN, UNITED STATES,	
<b>Approval by SCB2 Chairman :B. DALLE</b>	<b>Date : 2007, .April 16<sup>th</sup></b>



**PUBLICATIONS AND TUTORIALS ADVISORY GROUP : TOR**

<b>Group No : B2 – P&amp;TAG</b>	<b>Name of Convener : BELL Normand</b>	
<b>TITLE of the Group : B2- Publication &amp; Tutorial Advisory Group</b>		
<b>Scope:</b> This AG is to compile a comprehensive list of future publications based on input from all WG's. The group is to monitor the progress of the publications and ensure the review process is adhered to. Reviewers are to be recommended by the WG conveners. The AG will review this list and recommend the final list to the chairman. Reviewers will be appointed by the chairman at the administrative meeting. . Reviewers should know very well the subject and where possible, represent a cross section of the customers. The AG will prepare a guideline for tutorials, comment the list of proposed tutorials, suggest new tutorials as well as review the tutorials produced by WG's to ensure common level of standards, presentation etc. The Terms of Reference (ToR) of the B2-P&TAG are as follows : <b>1. Publications</b> <ul style="list-style-type: none"><li>• Edit and up date a list of Publications of SC B2 (past and future) : each February – June and October</li><li>• Propose to the chairman for each report the name of reviewers according to the customer needs : permanent</li></ul> <b>2. Tutorials</b> Tutorials have been set up in 2004 by Study Committee B2, to disseminate the knowledge available within CIGRE in the field of Overhead lines. The following parameters were established in regard to objectives: <ul style="list-style-type: none"><li>• Capture the knowledge and know-how developed by Cigré and other learned society and disseminate</li><li>• Make it available to all those who, because of lack of time or opportunities are not brought in contacts with this information</li><li>• Focus on present and near future needs</li><li>• Deliver neutral guidelines, deprived of commercial bias</li><li>• Improve visibility of recent developments in overhead lines related topics</li></ul> <ol style="list-style-type: none"><li>1. Tutorials should be presented at SC meeting in the country where the annual meeting is hold as a training for local engineers. Special time should be allocated for their presentation (Half a day or a complete day. A fee could be requested to cover tutorial preparation expenses or writer time.</li></ol> The AG Convener of B2-P&TAG will present on behalf of the AG members their findings regularly to SAG (strategic advisory group) and CAG (customer advisory group) and SC Members, at least once a year as the SC administrative meeting .  <b>Created:</b> 2004, <b>Duration :</b> permanent <b>Convener e-mail:</b> <a href="mailto:bell.normand@hydro.qc.ca">bell.normand@hydro.qc.ca</a>  <b>Countries represented :</b> AUSTRIA, BRAZIL, CANADA, JAPAN, FRANCE, IRELAND		
<b>Approval by SCB2 Chairman :</b>	<b>B. DALLE</b>	<b>Date : 2007, April 16<sup>th</sup></b>



**Publications and Tutorials Advisory Group : Action Plan**  
**ACTION PLAN 2007 – 2008**

<b>Group No : B2 – P&amp;TAG</b>	<b>Name of Convener : BELL Normand</b>
<b>TITLE of the Group : B2- Publication &amp; Tutorial Advisory Group</b>	
<b>Edition of action Plan for the next 2 years : 16/04/07</b>	
<b>1. Publications</b> <ul style="list-style-type: none"><li>- Edit and up date a list of Publications of SC B2 (past and future) : <b>each February – June and October 2007 &amp; 2008</b></li><li>- Propose for each report the name of reviewers according to the customer needs : <b>permanent</b></li></ul>	
<b>2. Tutorials</b> <p>List of presentation of tutorials : <b>May 2007 and 2008</b> The AG could comment the list of proposed tutorials, suggest new tutorials, review the tutorials produced by WG's to ensure common level of standards, presentation. Push the WG to organize Tutorials, Symposia, with the help of the National Committee where WG have their meetings.</p>	
<b>3. Web :</b> <p><b>The Web site will be maintained by AG convener.</b> The AG will comment or suggest improvements : <b>May 2007 and May 2008</b></p>	
<b>Deliverables:</b> <p>B2-P&amp;TAG will present their findings regularly to SAG (strategic advisory group) and CAG (customer advisory group) and SC Members, at least once a year as all the other working bodies or additionally whenever appropriate.</p>	
<b>Created: 2004, Duration : permanent</b>	
<b>Convener e-mail: bell.normand@hydro.qc.ca</b> <b>Countries represented : AUSTRIA, BRAZIL, CANADA, JAPAN, FRANCE, IRELAND</b>	
<b>Approval by SCB2 Chairman :B. DALLE</b>	<b>Date : 2007, April 16<sup>th</sup></b>





## WG 03 : TOR



SCB2-2004(WG03)  
Page 1/1  
Up dated August 2004

### Terms of reference of Working Group 03

<b>Working Group title:</b> Insulators	
<b>Convenor:</b> Revision: August 2004 C de Turreil	<b>Secretary:</b>
<b>Terms of reference:</b>  <b>The terms of reference of WG03 cover Electrical and mechanical aspects of insulators used in overhead systems related to the assessment of their performance and reliability with a view to assisting transmission engineers in improving line protection and reliability (integrity). The duration of the WG is 3 years and deal with the following aspects : Brittle Fractures , the return of experience on old long rod porcelain insulators and on cap and pin porcelain or glass insulators , the use of corona rings and Guide for the establishment of naturally polluted insulator test stations.</b>  <b><u>Specific Actions are :</u></b>  <b>1- 2 ELECTRA papers on Brittle Fractures of Composite Insulators</b> a. – Field Experience, Occurrence and Risk Assessment b. - Failure Mode Chemistry, Influence of Resin Variations and Search for a Simple Insulator Core Evaluation Test Method -> <b>Target – published in June and August 2004</b> <b>2- ELECTRA paper.</b> on the “Effect of Snow and Ice on insulators” -> <b>Target – June 2005</b> <b>3- Technical Brochure</b> on the use of corona rings on composite insulators; -> <b>Target – June 2005</b> <b>4- Technical Brochure</b> on the results of the evaluation of old insulators : -> <b>Target – June 2005</b> <b>5- Technical Brochure :</b> ”Guide for the establishment of naturally polluted insulator test stations”. -> <b>Target – December 2006</b>	
<b>Links with other SCs:</b> IEC TC 36, IEEE TFs, B2-11, D1	
<b>Approval by Technical Committee Chairman: Aldo Bolza</b> <b>Date: February 4, 2005</b>	



## WG 03 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
TF 3.4	Stress corrosion of insulators (Brittle Fracture) Reviewers : K. Papailiou – E. O'Connor	WG 03	ER 2001	ER 214 - ER 215 June/August 2004	IEC TC 36 IEEE TF
TF 3.9	Effects of snow and ice on insulators Reviewers : L. Rolfseng – M. Weibel	WG 03	ER 2003	ER 222 Oct. 2005	SC33
TF 3.10	Evaluation of old insulators Reviewers ; T. Seppa – K. Papailiou	WG 03	ER 2003	TB April 2006	
TF 3.12	Effects of vibrations on insulator hardware	WG 03		<i>Cancelled</i>	
TF 3.13	Effect of high temperature conductors Reviewers : G. Brennan – D. Douglass	WG 03	ER 2004	TB mid 2006 with WG12 & WG 11	
TF 3.14	Use of Corona rings for field control on composite insulators Reviewers : K. Papailiou – R. Stephen	WG 03	ER 2005	ER 223 – TB 284 December 2005	
TF 3.15	Guide for the establishment of naturally polluted insulators tests stations	WG 03	TB 2005	TB 2007	
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.03	28/02/2006		

**A tutorial will be established on the handling of Composite insulators.**



## WG06 : Terms of references

### STUDY COMMITTEE B2

#### Terms of Reference of Working Group 06

<b>Working Group title:</b> Principles of Overhead Line Design	
<b>Convenor:</b> Dr. Jan Rogier (Belgium)	<b>Secretary:</b> Pavel Fronek (Czech Republic)
<b>Terms of reference:</b>  “The WG B2.06 deals with methods to <b>improve electrical and mechanical design</b> of Overhead Line systems, including RBD (Reliability Based Design) methods, taking into account better knowledge of <b>meteorological issues</b> ”	
<b>Specific Actions are :</b>	
<ol style="list-style-type: none"><li>1. Task Force 01 (Convenor : Oswaldo Regis - Brazil ) “High Surge Impedance Load Lines (HSIL Lines) – A Concept to increase the Capacity of Overhead Lines” – Electra Report and Tutorial ➤ Target – End 2004/Begin 2005 (Electra Report); Brazil 2005 (Tutorial)</li><li>2. Task Force 02 (Convenor : Pavel Fronek – Czech Republic) “Mid Span Clearances – Questionnaire” –Technical Brochure ➤ Target – End 2006</li><li>3. Task Force 03 (Convenor : João Felix Nolasco - Brazil) “Questionnaire on Reduction of Overall Line Costs – An Assessment of Operation Costs and Reliability of Overhead Lines after Uprating and Upgrading” –Technical Brochure ➤ Target – End 2006</li><li>4. Task Force 04 (Convenor : Lars Rolfseng - Norway ) “Application Examples of Probabilistic Design according to CIGRE TB 178 and IEC 60826” –Technical Brochure ➤ Target – End 2005</li><li>5. Task Force 05 (Convenor : Chris Thorn – United Kingdom) “Comparison between Recent Probabilistic Design Methods” –Technical Brochure (In combination with TF 04) ➤ Target – End 2005</li><li>6. Task Force 06 (Convenor : Angel Gallego - Spain ) “The Influence of Line Configuration on Environment Impacts of Electrical Origin” –Technical Brochure ➤ Target – End 2004/Begin 2005 (sent for publication)</li><li>7. Task Force 07 (Convenor : Joël Angelini - France) “Lessons to be drawn from Big Storm Events” – Electra Report ➤ Target – End 2005</li><li>8. Task Force 08 (Convenor : Elias Ghannoum - Canada) “Generic Specification for an Ideal LRD (Load Reduction Device) to prevent extended Failures or Cascades after Extreme Loads” – Electra Report ➤ Target – 2006 or 2007</li><li>9. Task Force 09 (Convenor : Ghyslaine McClure - Canada) “Overhead Line Response to HIW (High Intensity Wind)” – Electra Report ➤ Target – 2006 or 2007</li></ol>	
<b>Links with other SCs:</b> SCs : C4.2 (for TF 06) WGs : WG B2.08; WG B2.13; WG B2.16 IEEE IEC : TC11; TC11/MT1; TC11/MT2	
<b>Approval by Technical Committee Chairman: Aldo Bolza      Date: February 4, 2005</b>	

## WG06 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
<b>TF 6.1</b>	“High Surge Impedance Load Lines” <i>Reviewers : R. Stephen - J. Fernandes</i>	Oswaldo Regis	2000 <i>ER</i>	ER 221 + tutorial August 2005	SC C1 SC C4
<b>TF 6.2</b>	“Mid-span clearances” <i>IR: Overview of answers to the questionnaire. Reviewers : D. Douglass - J. Fernandes</i>	Pavel Froněk	2003 TB + ER	TB end 2006	TB 48
<b>TF 6.3</b>	“How Overhead Lines are Re-designed for Upgrading/Upgrading – Analysis of the Answers to the Questionnaire” <i>Reviewers : H. Oebro – R. Meijers</i>	João Felix Nolasco	2005 TB + ER	TB mid 2006	Ex-WG 22.09
<b>TF 6.4</b>	“Application examples of probabilistic design” <i>Report to clarify interpretations of IEC 60826 (based on TB 178). (TB with TF05)</i> <i>Reviewers : M. Ervik - B. Dalle</i>	Lars Rolfseng	2002 TB + ER <i>Part Tutorial</i>	Tutorial 2004 TB April 2006	IEC 60826 TB 178
<b>TF 6.5</b>	“Comparison between recent probabilistic design methods” (TB with TF04) <i>Reviewers : M. Ervik - B. Dalle</i>	Chris Thorn	2002 TB + ER		EN 50341 TF 04
<b>TF 6.6</b>	“Influence of line configurations on impacts of electrical origin” <i>Reviewers : D. Douglass – R. Lindgren</i>	Angel Gallego	2001 TB - ER	TB 278 – ER 221 August 2005	SC C3
<b>TF 6.7</b>	“Lessons to be drawn from wind storms”	Joël Angelini	2004 <i>IR (+Tutorial?)</i>	ER or TB 2007	TB 178
<b>TF 6.8</b>	Response of lines to HIW	Ghyslain McLure	2007 TB	TB beginning 2007	IEC 60826 TB 178
<b>TF 6.9</b>	“Requirements for a generic specification for an ideal load reduction device” <i>Reviewers : K. Fukami – G. Ghemghita – P. Eychenne</i>	Elias Ghannoum	2004 <i>IR</i>	Web 2006	TB 174 ER 193
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.06	28/02/ 2006		

A tutorial on “Probabilistic design of overhead transmission lines” (thematic brochure 178) has been prepared for CIGRE SCB2 meeting in PARIS 2004.

A tutorial has been presented in BRAZIL on HSIL lines in September 2005

Another one will be presented in Montreal May 2006 on “How Overhead Lines are Re-designed for Upgrading/Upgrading “



## WG07 : Terms of References

# STUDY COMMITTEE B2

## Terms of reference of Working Group 07

<b>Working Group title:</b> Foundations	
<b>Convenor:</b> Neil Cuer	<b>Secretary:</b> Eddie O' Connor
<b>Terms of reference:</b> <p>The terms of reference of WG07 covers the subsurface investigation, geotechnical and structural design of foundations including: the analysis of different reliability concepts (deterministic, probabilistic, semi-probabilistic), practical construction of the foundations and quality management (safety, feasibility, durability, environmental impact, construction equipment), foundation testing, cost analysis, damage and failure analysis, assessment inspection, maintenance and strengthening of foundations.</p> <p>The duration of the WG is 2 years and will deal with the following specific aspects:</p> <ol style="list-style-type: none"><li><b>1. Brochure – Probabilistic design of Foundations</b><ul style="list-style-type: none"><li>➤ Target – End 2005</li></ul></li><li><b>2. Brochure – Foundation installation</b><ul style="list-style-type: none"><li>➤ Target – End 2006</li></ul></li><li><b>3. Report - Interaction between towers and foundations</b><ul style="list-style-type: none"><li>➤ Target - 2006</li></ul></li><li><b>4. Review and if thought appropriate, update previously issued WG07 Brochure on: - Foundation Testing</b><ul style="list-style-type: none"><li>➤ Target - 2006</li></ul></li></ol>	
<b>Links with other SCs:</b> SCs :- None  WGs :- B2 – WG06, B2 – WG08, B2 – WG13 IEC :- TC11	
<b>Approval by Technical Committee Chairman: Aldo Bolza Date: February 4, 2005</b>	



## WG07 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
<b>TF 7.03</b>	<b>Influence of non vertical loads on foundation uplift capability :</b> <i>The report is at present subject to internal review within the WG and will be forwarded to SCB2 for agreement.</i>	E. DEMBICKI	1998	ER 219 April 2005	
<b>TF 7.04</b>	<b>Probabilistic design of foundations</b> <i>The aim of the task force is to provide guidance on the application of probabilistic techniques. Reviewers : J. Rogier &amp; R. Menezes</i>	A. HALDAR	1998	TB end 2006	WG 06
<b>TF 7.05</b>	<b>Foundation testing</b>	M. VANNER	2003	<i>Under review</i>	IEC TC 11
<b>TF 7.06</b>	<b>Design and installation of micropiles and ground anchors</b> <i>The aim of the task force is to provide guidance on their design.</i> Reviewers : H. Oebro – G. Brennan	M. PIETSCHKE	2003	TB 281 – ER 222 October 2005	
<b>TF 7.07</b>	<b>Case Histories of foundation upgrading and refurbishment</b> <i>The aim of this task force is to compare the procedures for the refurbishment and upgrading</i>	O'CONNOR	2003	<i>TB end 2007</i>	
	<b>Foundation installation an overview</b> <i>Reviewers : J. Rogier – H. Oebro</i>	O'CONNOR	2003	<i>End 2007</i>	
	<b>Interaction between tower and foundation</b>	L. BINETTE	2006	<i>Mid 2007</i>	WG08
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.07	28/02/ 2006		

- **A tutorial will be prepared on Foundation Design or on Foundation Installation report?**



## WG 08 : Terms of references

### Terms of reference of Working Group 08

<b>Working Group title:</b> Transmission Line Structures	
<b>Convenor:</b> João B.G.Ferreira da Silva	<b>Secretary:</b> David Hughes
<b>Terms of reference:</b>  The scope of work for WG08 covers the review and update the knowledge of OHL supports used in the existing lines and/or to be used for new lines.  It comprehends research, design and construction aspects of the OHL supports as well as the inspection and assessment methods of existing ones. Innovative solutions and/or special supports for OHL crossings are also focused. Improving the mechanical reliability of the OHL supports is another essential issue to be dealt with.  <b>Deliverables:</b> An Action Plan was set up in 2004 to close all the on-going projects till 2007. The expected deliverables in that period are:  <ol style="list-style-type: none"><li>1. <b>TF2 – Variation in Tower Strengths:</b> <b>Part III</b> - “On the Failure Load of Transmission Line Steel Towers considering the Design Techniques and Material Properties” <b>Target – Sept. 2004 - ER</b>  <b>Part IV</b> – On the Failure Load of Transmission Line Steel Towers Considering Uncertainties Arising from Manufacturing &amp; Erection Processes <b>Target – Dec.2006 – ER</b> - TF2 Tutorial</li><li>2. <b>TF3-Towers for New Lines – New Concepts and Design Parameters</b> 3.1 – Innovative Solutions for Overhead Line Supports <b>Target – Sept. 2007 – ER &amp; Brochure</b> - TF3 Tutorial  3.2 – Comparison of General Practices for Lattice Tower Design and Detailing <b>Target – Dec. 2004 – ER &amp; Brochure</b></li><li>3. <b>TF4 – Discrepancies between Predicted and Measured Values of Load in Members of Towers during Tests:</b> - Influence of the Hyperstatic Modelling <b>Target – Sept. 2005 – ER &amp; Brochure</b> - Possible TF4 Tutorial</li><li>4. <b>TF5 - Improvement of Tower Testing Methodology</b> <b>Target – Dec. 2005 – ER &amp; Brochure</b></li><li>5. <b>TF6 - Large Overhead Line Crossings</b> <b>Target – Dec. 2007 – Brochure</b></li><li>6. <b>Joint TF - WG07 &amp; WG08:</b> <b>Tower/Foundation Interconnection</b> <b>Target – Dec. 2006 – ER &amp; Brochure</b></li></ol>	
<b>Links with other SCs:</b> SCs :- None WGs :- B2WG06, B2WG07, B2WG11, B2WG16 IEC :- 60826, P652 ASCE: 10-97	
<b>Approval by Technical Committee Chairman: Aldo Bolza      Date: February 4, 2005</b>	



## WG 08 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
<b>TF 8.01</b>	<b>Assessment of existing structures and implementation of the results</b>	R. PASCHEN J. ROGIER	TB -12/00	ER 207 + tutorial April 2003	
<b>TF 8.02</b>	<b>Variation in tower strengths :</b>	R. MENEZES			
	Part I : Variability of the mechanical Properties of materials		05/99	Part I ER 189 April 2000	
	Part II : Influence of materials discrepancies on Tower strength		12/00	Part II : 06/03 ER 207 - TB229 June 2003	
	Part III : Failure load of transmission Line steel towers considering the variation of mechanical properties		ER 2000	Part III : SC web July 2005	
	Part IV : On the failure load of transmission line Steel towers		ER -12/05	For all parts TB 2007	
<b>TF 8.03</b>	<b>Towers for New Lines</b>				
	3.1- Innovative Solutions for Overhead Lines Supports	MRS. PELLET		ER 2007	
	3.2 – Comparison of general practices for Lattice Tower Design and Detailing -> Reviewers : A. Gallago – H. Lugschitz	MR. VILLA	TB 12/2000	TB mid 2006	
	3.3 – The Application of Horizontal Bracing and Diaphragms in Towers	G. GHEORGHITA	TB 12/00	TB 196 2002	
<b>TF 8.04</b>	<b>Discrepancies between Predicted and Measured values of Load in Members of Towers during tests :</b> - Influence of hyperstatic Modelling - Use of refined computation methods as a complement to tower testing  Reviewers : R. Steven – H. Oebro	H. KEMPNER	ER 12/00	TB early 2006	
<b>TF 8.05</b>	<b>Improvement on the methodology of Tower Testing</b>	D. HUGUES	TB 12/99	ER-TB sept. 2006	
<b>TF 8.06</b>	<b>Large Overhead Lines crossings</b>	MR . HUGUES	TB-07-03	TB-dec. 2007	
<b>JTF 07-08</b>	<b>Tower/foundation interconnection</b>	L. BINETTE	ER-TB 06	ER-TB dec. 2006	WG 07
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.08	28/02/ 2006		

**A Tutorial TUT 04 has been prepared on Assessment of existing structures.**





## WG 11 : Terms of References

### Terms of reference of Working Group 11

<b>Working Group title:</b> Mechanical Behaviour of Conductors and Fittings	
<b>Convenor:</b> David Hearnshaw (From September 2004)	<b>Secretary:</b> To be Decided – a number of candidates are being considered.
<b>Terms of reference:</b> <p>The terms of reference of WG11 cover the investigation and reporting on, through tutorials, papers and guides, aspects of the mechanical behaviour of overhead transmission line conductor and earthwire/fittings systems, including optical fibre cable/fittings systems, under both static and dynamic loads with a view to assisting transmission engineers in improving line protection and reliability (integrity). The duration of the WG is 4 years and will deal with the following aspects. Note that these topics are linked with many joint members, which is best dealt with as a single working group with a number of tasks.</p> <p><b>Specific Actions are :-</b></p> <ol style="list-style-type: none"><li><b>Guideline - 'Modelling of Aeolian Vibration of a Single Conductor plus Damper – Assessment of Technology'</b><ul style="list-style-type: none"><li>➤ Target – End 2004</li></ul></li><li><b>Tutorial on 'Safe Design Tension with respect to Aeolian Vibration'</b><ul style="list-style-type: none"><li>➤ Target – Brazil '05</li></ul></li><li><b>Guideline - 'Aircraft Warning Markers'</b><ul style="list-style-type: none"><li>➤ Target – Brazil '05</li></ul></li><li><b>Brochure (&amp; possible Tutorial) - 'State of the Art Study of Galloping on Iced Conductors'</b><ul style="list-style-type: none"><li>➤ Target – Paris 2006</li></ul></li><li><b>Guidelines, Brochure (&amp; possible Tutorial) - 'Fatigue Endurance Capability of Conductor/Clamp Systems: A 3 part update of present knowledge :-</b> <b>Part 1 – Mechanics of the phenomenon</b><ul style="list-style-type: none"><li>➤ Under review</li></ul> <b>Part 2 – Effect of the Phenomena'</b><ul style="list-style-type: none"><li>➤ Target – Paris 2006</li></ul> <b>Part 3 – Engineering Guidelines'</b><ul style="list-style-type: none"><li>➤ Target – Paris 2006? (Possibly Spring 2007)</li></ul></li><li><b>Input to update of IEC Specifications on Fittings, Spacers and Dampers</b><ul style="list-style-type: none"><li>➤ Target – Ongoing/End 2006</li></ul></li><li><b>Review and if thought appropriate, update previously issued WG11 Guides on: -</b><ol style="list-style-type: none"><li>7.a - Interphase Spacers</li><li>7.b - Vibration Measurements</li><li>7.c - Optical Fibre Cable Fittings</li></ol><ul style="list-style-type: none"><li>➤ Target – End 2007</li></ul></li></ol> <p><b>New Work Item :-</b></p> <ol style="list-style-type: none"><li><b>Guideline – 'Performance of 'Old' Fittings'</b><ul style="list-style-type: none"><li>➤ Possible Target – 2007</li></ul></li></ol>	
<b>Links with other SCs:</b> SCs :- None WGs :- B2 – WG03; B2 – WG12; B2 – WG16 (Proposed) IEEE :- WG on Overhead Conductors IEC :- TC11 – WG09	
<b>Approval by Technical Committee Chairman: Aldo Bolza      Date: February 4, 2005</b>	



## WG 11 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
<b>TF11.01</b>	Aeolian vibrations of single conductors plus dampers Reviewers : T. Seppa – F. Jackl Bundled conductors	G. DIANA	ER 12/02	ER 233 December 2005	
<b>TF11.03</b>	Guide to fittings on Transmission lines : - Fittings for high temperature conductors Reviewers : T. Seppa- D. Douglass	D. SUNKLE	ER 12/03	Web June 2005 TB mid 2006 with WG 12 - WG 11	SC B2-WG 12
	Aircraft warning sphere Reviewers : R Stephen – H. Lugschitz	D. SUNKLE	ER 12/04	ER Feb 2006	
<b>TF11.04</b>	Design guide on safe design tension for bundled conductors	C. HARDY	ER 12/04	ER 220 -TB 273 June 2005	IEC Conductor dynamics
<b>TF11.05</b>	State of the Art Survey on spacers and Spacers Damper :	L. CLOUTIER			IEC Conductor dynamics IEC TC 11 WG 09
	Part I : State of the Art		ER - 2002	ER 209 August 2003	
	Part II : Technical Aspects : Reviewers : R. Stephen – T. Jacobs		ER – 2002	TB 277 - ER 221 August 2005	
	Part III : Experiences with current practice Reviewers : R. Walter – G. Georghita		ER - 2003		
<b>TF11.06</b>	Galloping State of the Art study of galloping on iced conductors	JL. LILIE	ER 2006	TB 2007	
<b>TF11.07</b>	Fatigue endurance capability of conductor in systems Part 1 – Mechanics of the phenomenon reviewers Part 2 – Effect of the phenomena Reviewers: T. Seppa – D. Hussels	L. CLOUTIER L. CLOUTIER	ER 03/04	Web june 2005 TB june 2006	IEC Conductor dynamics IEC TC 11 WG 09
	Engineering guidelines	L. CLOUTIER		TB + tutorial 2006	
	<b>TF 11.08</b>	WG 11 THEMATIC BROCHURE : the proposition of publishing a thematic brochure on all valuable information has been accepted by SC 22.	WG 11	TB 2002	<b>TB 251</b> <b>August 2004</b>
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.11	28/02/ 2006		

**2 tutorials has been presented on Optical cables and fittings in September 2004 and another prepared on Safe design Tension with respect to Aeolian vibration for BRAZIL meeting in Sept 05.**



## WG 12

### STUDY COMMITTEE B2 Terms of reference of Working Group 12

<b>Working Group title:</b> Electrical Aspects of Overhead Transmission Lines	
<b>Convenor:</b> Dale Douglass	<b>Secretary:</b> Michele Gaudry
<b>Terms of reference:</b> WG12 is to study and evaluate problems and phenomena that originate in the line's electrical function, our goal being to define criteria and parameters for line design and power transfer rating. The duration of the WG is 4 years and will deal with the following aspects. Note that these topics are linked with many joint members, which is best dealt with as a single working group with a number of tasks.	
<b>Specific Actions are :-</b> <ol style="list-style-type: none"><li>1. <b>Technical brochure, Electra article and Tutorial on a "Guide to Sag-tension Calculations"</b><ul style="list-style-type: none"><li>➤ Target – Brazil 2005 (Joint with WG11)</li></ul></li><li>2. <b>Technical brochure, Electra article, and Tutorial on a "Guide to Selection of Weather Conditions for Overhead Line Ratings"</b><ul style="list-style-type: none"><li>➤ Target – End 2005 (Joint with IEEE Subcommittee on Line Design)</li></ul></li><li>3. <b>Technical Brochure, Electra article, and Tutorial on "Calculation of AC Resistance for Bare Overhead Conductors"</b><ul style="list-style-type: none"><li>➤ Target – Paris 2006</li></ul></li><li>4. <b>Review and if thought appropriate, update previously issued WG12 Guides on: -</b><ol style="list-style-type: none"><li>a – Thermal rating calculation methods</li><li>b – Field evaluation of conductor joints</li><li>c – Dynamic &amp; probabilistic rating methods</li></ol><ul style="list-style-type: none"><li>➤ Target – End 2007</li></ul></li></ol>	
<b>Links with other SCs:</b> SCs :- B3 WGs :- B2 – WG6, 11, 16 IEEE :- Subcommittee on Line Design (TP&C)	
<b>Approval by Technical Committee Chairman: Aldo Bolza      Date: February 4, 2005</b>	



## WG 12 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
TF 12.1	Conductors for the Uprating of Overhead Lines <i>Reviewed by SC B2. Comments incorporated in final version.</i> <i>Reviewers : E. Shantz – K. Papailiou – J. Fernandez</i>	R. KIMATA	ER 12/02	TB 244 + tutorial 2004	
TF 12.2	AC resistance of Conductors : <i>Request assignment (or re-assignment) of reviewers by SC B2 at Edinburgh meeting.</i> <i>Reviewers: J. H. Nolasco – D. Muftic - V. Morgan</i>	L. VARGA	ER 12/00	TB 2006	to discuss with SC 37 & 38
TF 12.3	Sag tension calculation methods <i>Reviewers : G. Brennan, J.-L. Peralta, J. Rogier-</i>	D.DOUGLASS		TB 2006	To discuss with WG11 & WG07
TF 12.4	Calculation of temperature rise in short circuit for OPGW.	R. KIMATA		Dropped	To discuss with SC 35
TF 12.5	De-icing bare overhead power line conductors see TF 16.4	S. FIKKE	ER 2003	ER 2007	WG 16
TF 12.6	Selection of weather conditions for overhead line ratings <i>Reviewers: V. Shkaptov – B. Wareing</i>	T. SEPPA		TB 2006	IEEE and T Pand C Subcommettee
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.12	28/02/ 2006		

**1 Tutorial has been proposed on conductors for uprating OHL in 08/2004 and another one will be prepared on Thermal rating.**



## WG13

### Terms of reference of Working Group 13

<b>Working Group title:</b> Maintenance and Management of Existing Overhead Lines	
<b>Convenor:</b> Dr. Keith E. Lindsey (USA) (From September 2004)	<b>Secretary:</b> To be Decided.
<b>Terms of reference:</b>  The terms of reference of WG13 cover the investigation and reporting on, through tutorials, papers and guides, refurbishment or extended utilization of existing overhead transmission lines and guidelines for emergency resource planning for overhead transmission line asset owners. The duration of the WG is 2 years and will deal with the following aspects.  <b>Specific Actions are :-</b>  <ol style="list-style-type: none"><li><b>1. Electra Report:</b> Guidelines for Emergency Resource Planning for Overhead Transmission line Asset Owners. <b>Scheduled:</b> December 2004</li><li><b>2. Technical Brochure:</b> Guidelines for Refurbishment or Extended Utilization of Existing Overhead Transmission Lines. <b>Scheduled</b> August 2005</li></ol>	
<b>Links with other SCs:</b>	
<b>Approval by Technical Committee Chairman: A. Bolza      Date: february 17, 2005</b>	



## WG 13 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links
<b>TF 13.1</b>	Tutorial CIGRE Guidelines for the Management of Existing Overhead Transmission Lines	K. LINDSEY	Sept 9, 2003	ER 205 + tutorial Sept. 2003	
<b>TF 13.2</b>	Guidelines for INCREASED extended utilization of existing overhead transmission lines Reviewers : J. Nolasco, S. Hoffman	G. BRENNAN	June 30, 2004	TB mid-feb. 2006	
<b>TF 13.3</b>	Technical Brochure Impact of revenue generation allocation of overhead line assets on maintenance, operation and refurbishment of overhead lines	T. SEPPA	June 30, 2004	Dropped	
<b>TF 13.4</b>	Guidelines for emergency materials inventory for overhead transmission line asset managers Reviewers : N. Bell – B. Dalle	E. SHANTZ	August, 2004	ER 222 Oct. 2005	
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.13	28/02/ 2006		

**1 tutorial has been presented on Management of Existing Overhead Transmission Lines (09/2003).**



WG16  
**STUDY COMMITTEE 22**  
Terms of reference of Working Group 16

<i>Working Group title:</i> Meteorology for overhead lines	
<i>Convenor:</i> Svein M. Fikke (Norway)	<i>Secretary:</i> Brian Wareing (UK)
<p><b>Terms of reference (Updated November 2004):</b> Extreme weather affects severely overhead lines in many ways, both mechanically and electrically. Such influences result particularly from wind, icing, temperature and lightning. In addition, pollution combined with wind, precipitation and icing may affect the insulation properties. Several Working Groups within SCB2 deal already with these effects. However, considering the many adverse and wide-spread weather impacts on electrical systems in many countries during recent years, as well as the general concerns about changes in global climate, including possible increased frequency of high wind and icing incidents, WG16 will handle such topics from a meteorological point of view, as an interface between the engineering side and the current developments in meteorology.</p> <p>Specific Actions are:</p> <ol style="list-style-type: none"><li><b>1. Task Force 01 (Convenor : Svein M. Fikke - Norway) “Design wind speed calculations in local topography” – Technical Report and Tutorial</b> ➤ Target – Brazil 2005</li><li><b>2. Task Force 02 (Convenor : Henry Hawes – Australia) “Frequency and magnitude of high intensity winds” – Technical Brochure – Electra Report - Tutorial</b> ➤ Target – TR and ER submitted for publication September 2004. Tutorial End 2004</li><li><b>3. Task Force 03 (Convenor : André Leblond – Canada) “Meteorological icing models, statistical models and topographical effects” – Technical Brochure Electra Report – Tutorial</b> ➤ Target – Brazil 2005</li><li><b>4. Joint Task Force WG12/WG16 (Convenor : Svein M. Fikke - Norway ) “Operating system for prediction and monitoring of icing events, anti-icing and de-icing technologies for overhead lines” –Technical Brochure</b> ➤ Target – End 2006</li></ol>	
<i>Links with other SCs:</i> WGs: WGB2.06, WGB2.08 and WGB2.12	
<i>Approval by Technical Committee Chairman: Aldo Bolza</i> <i>Date: February 4, 2005</i>	



## WG 16 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links With other SC or CEI , ...
<b>TF 16.1</b>	Guidelines for design wind speed calculations in local topography Reviewers : K. Fukami – V. SHKAPSTOV	S. Fikke	2004	TB-Mid 2006	WG 06
<b>TF 16.2</b>	Report of current practices regarding frequency and magnitude of high intensity winds Reviewers : H. Lugschitz – R. de Menezes	H. Hawes	2004	ER216 – TB 256 Tutorial Oct. 2004	
<b>TF 16.3</b>	Guidelines for meteorological models and statistical methods relating to icing events and ice loads, including topographical effects Reviewers : M. Milosevic – B. Dalle	A. Leblond	2005	TB 291 April 2006 ER 225	
<b>TF 16.4</b>	TB: "Operative system for prediction and monitoring of icing events"	S. FIKKE	2006	TB 2006	
	WG conveners prepare the TOR (scope and objective) for each topic and TOR for new WG	WGB2.16	28/02/ 2006		

**1 tutorial on High Intensity wind has been presented in September 2004 during PARIS Cigre Meetings.**





## JWG B2.17/B4/C1

### Terms of reference of B2.17/B4/C1

<b>Working Group title:</b> IMPACTS OF HVDC LINES ON ECONOMICS OF HVDC PROJECTS	
<b>Convenor:</b> J. NOLASCO <b>Date of proposal:</b> up dated 22 Oct 2004	<b>Secretary:</b> To be appointed
<b>Terms of reference:</b> <p>The use of HVDC technology is increasing with the use of IGBT's and other such high speed, relatively low cost technology equipment. This has made DC technology an option for lower voltages as well as for higher voltages. The issues such as T-offs (Intermediate substations for supplying loads or AC systems) and fault level requirements as well as cost of terminal equipment have been addressed to a certain extent in many cases. In determining the technology to be used for different power transfer operations, it is necessary to determine the cost of the terminal equipment as well as the line linking the terminals. The determination of the HVDC system as a whole (Converter Stations plus Transmission Line) may prove more adequate than the investigation of the terminal equipment only.</p> <p>The WG will review the work of B4 and B2.09 (Former WG of B2) and develop models for evaluating the cost of DC lines.</p> <p>The expect time is 3 years from March 2005 to 2008.</p>	
<b><u>Specific Actions are :</u></b> <p>Some of the results of this WG would be :</p> <ul style="list-style-type: none"><li>▪ to identify state of the art solutions in a summary as far as "Parametric studies of overhead transmission costs" (Electra n° 136 - June 1991), prepared by WG B2.09, and of other similar technical reports applicable to DC lines,</li><li>▪ to evaluate the cost of HVDC typical lines and establish economical global evaluation with intermediate substations to supply AC systems (+ cost of losses, interest rate,...)</li><li>▪ to publish in 2008 a Technical Brochure giving basic electric and mechanical performance of HVDC system ( Transmission Lines + Converter stations) with economical cost evaluation.</li></ul>	
<b>Links with other SCs:</b> B4, C1	
<b>Approval by Technical Committee Chairman:</b> Aldo Bolza <b>Date:</b> February 4, 2005	



### ACTION PLAN JWG B2/B4/C1.17

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links With other SC or CEI , ...
TA 17.1	Impact of HVDC Lines on the Economics of HVDC Projects	J.-F. Nolasco	2008	ER + TB	SC B4 and SC C1



**SCB2-TF 18/D2**

**Terms of reference of B2 TASK FORCE (with collaboration of D2)  
B2TF18-B2-D2**

<b>Working Group title : OVERHEAD LINES GEOGRAPHICAL AND ASSET INFORMATION SYSTEM</b>	
<b>Convenor:</b> H. VOSLOO	<b>Secretary:</b> To be appointed
Date of proposal: August 2004	
<b>Terms of reference:</b> The development of Information System, as far as Geographical and asset management systems are concerned, is very large and is an important issue for Transmission Companies.  The WG would answer to these questions : <ul style="list-style-type: none"><li>- Is sharing of geographical data a necessity among Transmission and Distribution Companies or even with other utilities ( Telecommunication, Transport, gas... ) in order to get a better acceptance of overhead lines)</li><li>- What are the own needs of a Transmission Company in term of geo-referenced information : Asset management, Work management (maintenance, vegetation survey, refurbishment of OHL, reinforcement, emergency operation ) ?</li><li>- Which data for what purpose? According to which format ?</li><li>- possible utilization of geographical information system (Use of Numerical model of terrain, satellite image, ..)</li><li>- geomatic : perspectives of developments,</li><li>- Data recording of HV Lines by means of helicopter or drones and laser survey, data processing and storing ...</li></ul> The expect time is 2 years from commencement of the Group : a report and a contribution to the 2006 session will be finalized before June 2006.	
<b>Links with other SCs:</b> D2 -	
<b>Approval by Technical Committee Chairman: Aldo Bolza</b> <b>Date: October 4, 2004</b>	



## SCB2-TF 18 /D2 : Action Plan

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links With other SC or CEI , ...
TA 17.1	Development of information system as far as geographical and asset management	H. Vosloo	2006	ER or TB End 2006	SC D2



## SCB2-JWG19/C1

### Terms of reference of B2- C1 JOINT WORKING GROUP

<b>Working Group title : INCREASING CAPACITY of OVERHEAD LINES-NEEDS AND SOLUTIONS</b>	
<b>Convenor:</b> P. PRAMAYON	<b>Secretary:</b> To be appointed
Date of proposal: 27 <sup>th</sup> of October 2004	
<b>Terms of reference:</b>	
<p>Electric Utilities now face increasing pressure to avoid new transmission lines while reregulation and the increase of electricity use worldwide require either additional corridors and/or the need to drive existing systems closer to their technical limits. Both electricity researchers and manufacturers seek solutions to this problem and are focused on many new methodologies or technologies aiming at bringing some solutions for the system planners to optimize the use of existing lines and equipments. The main advances in OHL technologies presented at the last SC B2 general session that can be used for this purpose are for instance :</p> <ul style="list-style-type: none"><li>▪ high temperature conductors and optimized conductors,</li><li>▪ sag compensators,</li><li>▪ means for up grading lines (increase of voltage)</li><li>▪ use of probabilistic ampacity calculation,</li><li>▪ real time monitoring and thermal rating,</li><li>▪ New methods of monitoring and calculation which may be used to improve capacity</li><li>▪ rated line reliability,</li></ul> <p>Whichever technology is chosen, discussions between Planners / Operational Engineers on one side and Researcher / Manufacturers on the other side show that all parties do not communicate enough. Security, reliability and economical aspects make planners skeptical towards Researchers / Manufacturers who on the other side, do not always clearly know the full range of constraints and concerns shared by planners and systems operators.</p> <p>The purpose of this new JWG would be to gather both planners (SC C1) and OHL specialists (SCB2) and make them share some common thoughts on Increasing Power Capacity of lines, while taking all aspects into account : Economics, technical feasibility, Security, Reliability, Operational Planning constrains, Maintenance...</p> <p>More generally, one of the main goal of this JWG would be to make Planners, designers, operators and Manufacturers share the same vocabulary, the same concerns, and the same visions so as to converge towards a range of optimal solutions for a more reliable and optimized network. Some of the results of this WG would be :</p> <ul style="list-style-type: none"><li>▪ to identify state of the art solutions in a summary as far as the technology is concerned ;</li><li>▪ To classify all proposed solutions made by system planning operators according to their economical and electrical system interests ;</li><li>▪ A list of all advantages and disadvantages of these solution seen from each different parties and experts ;</li><li>▪ A description by planners of their medium term problems and needs which could form a 10 year ahead roadmap for designers, manufacturers and Researchers.</li></ul> <p>The duration of this JWG time is 3 years from December 2004 to December 2007. The JWG will have to produce a report or a publication for the PARIS SESSION of 2008 in December 2007.</p>	
<b>Links with other SCs:</b> C1 -	
<b>Approval by Technical Committee Chairman:</b> A. Bolza	<b>Date:</b> November 1, 2004



## JWG B2/C1.19 ACTION PLAN

	Technical Action Plan	Leader	Initial schedule	Type of action & Schedule	Links With other SC or CEI , ...
TA 19.1	Publication PARIS SESSION 2008	P. Pramayon	2007	ER or TB End 2007	SC C1



## TF B2.20 : MANAGEMENT OF RISKS DUE TO LOAD-FLOW CAPACITY

<b>Task Force title:</b> Management of risks due to load-flow capacity increases in Transmission Overhead Lines	
<b>Convenor:</b> JM CHANTRON ( FRANCE)	<b>Secretary:</b> TBD : ...
<b>Terms of reference:</b>  Context The forecast for increased growth in demand for electricity over the next few years urgently requires Transmission System Operators to take opportune action. Moreover, it is already difficult to build new overhead lines or substations, because of environmental constraints and public opinion. In this context, increasing the load-flow capacity in existing transmission lines is seen as a valid alternative. Nevertheless, the current uprating of overhead lines could not be realized without risk management (safety, components lifespan and exploitation, economical and environmental constraints). Objectives and method The goal of this Task Force could be to share expertise and exchange ideas to deal with the management of risks due to load-flow capacity increases in transmission overhead lines. The main tasks could be : <ul style="list-style-type: none"><li>· identification as most as possible of risks scenarii due to load-flow capacity increases, with their descriptions and interactions (cause/effect diagram); the objective is to take into account impact towards safety, impact towards equipment lifespan (acceleration of the ageing due to uprating), impact on environment (electromagnetic field, noise...), impact towards transmission network exploitation (maintenance, refurbishment, availability...),...</li><li>· evaluation of their consequences: this step permits to assess the likelihood and gravities of each risk, thanks to simulation of physical phenomena (for example : joint life prediction model, thermal rating calculations at elevated conductor temperature,...), experience feedback and engineering judgement; after that, we can build a global risk management process with bayesian networks (probabilistic approach),</li><li>· classification of risks scenarii : risk map is the method used as support for decision making,</li><li>· estimation of solution impacts to treat them (for example : re-tensioning the conductors, ...).</li></ul> The components of overhead lines, that we plan to consider, are conductors, joints, earth wires and accessories (clamp, jumper, damper, conductor spacer, insulators, ...). The TF will consider the application of the proposed method to other situations of risks, giving the limitations or conditions of applicability. Schedule and deliverables End of 2005: Subject definition and list of Working Group members End of 2006: First draft of risks mapping June 2008: Complete study (risks network + treatments) Proposition of a paper	
<b>Links with other SCs:</b> <i>Will be considered after this first case study .</i> <b>SCs :</b> None <b>WGs :-</b> WGB2.03; WGB2.06 ; WGB2.11; WGB2.12- WGB2.13	
<b>Approval by TC Chairman:</b> Aldo Bolza	<b>Date:</b> November 22, 2005