



SC B2 : DISCUSSION GROUP



INTERNATIONAL COUNCIL
ON LARGE ELECTRIC SYSTEMS

SC B2

Overhead Lines

[What is SC B2?](#) > [Technical activities](#) > [Events](#) > [Publications](#) > [Members area](#) > [WG area](#) > [Links](#)



[Site map](#) > [Contact](#) > [Newly updated](#)

This site is best viewed at 1024x768 screen resolution with Internet Explorer 5.5 or later.

Welcome to the SC B2

www.cigre.org

WARNING : CIGRE could in no case be considered responsible
for any consequences tied to the use of information included in this site.

© SCFI
2005

August 26th, 2008

www.cigre-b2.org



SC B2 : DISCUSSION GROUP

SC B2 : OVERHEAD LINES MISSION – SCOPE - PARTICIPANTS DELIVERABLES : PUBLICATIONS & TUTORIALS

B. DALLE
SC B2 Chairman
PARIS 2008
August 26th

OBJECTIVES of the PRESENTATION :

1. Mission and objectives of B2
2. Main targets
3. The changing environment and new customers
4. Countries represented
5. Study committee organisation
6. How to take advantages of this program ?

1. **MISSION** : To facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of overhead lines.
2. **SCOPE** :
 - Design, study of electrical and mechanical characteristics and performance,
 - Route selection, construction, operation service life,
 - Maintenance, refurbishment, uprating and upgrading of overhead lines and their components.

Main SCB2 TARGETS

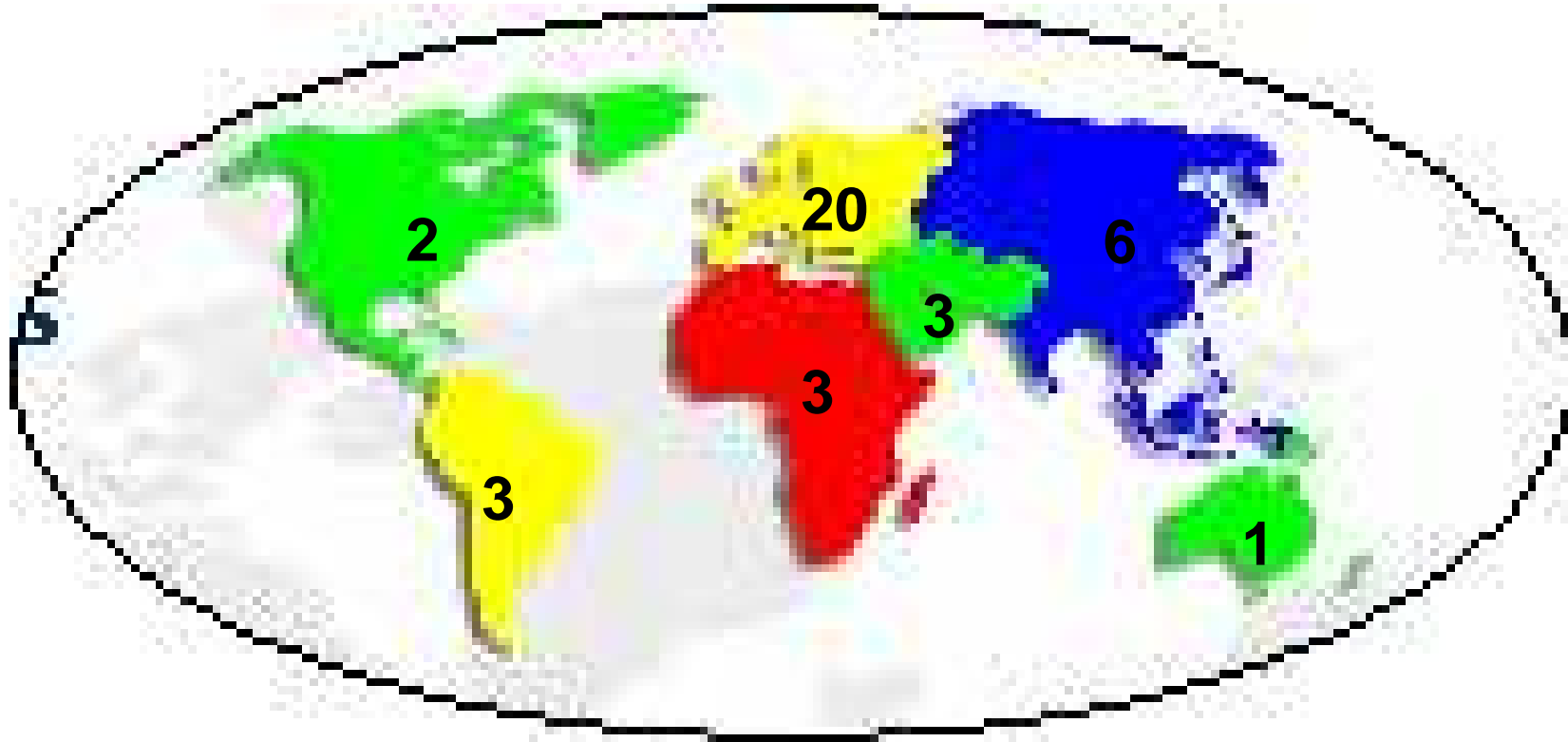
To develop methods for

- 1- Getting more out of existing lines
- 2- Operating lines at their thermal limit
- 3 -Refurbishing lines and components
- 4 - Providing more reliable and available lines

A Changing Operating Environment



SC B2 Membership : 37 COUNTRIES



It's important to take into account the needs of developing countries

Study committee B2 organisation

Study committee B2 is divided into 4 technical groups :

1. - Electrical performance
2. - Components : towers, insulators and foundations
3. - Mechanical behaviour of conductors and fittings
4. - Asset management, reliability and availability

Study committee B2 = 22 WG's,

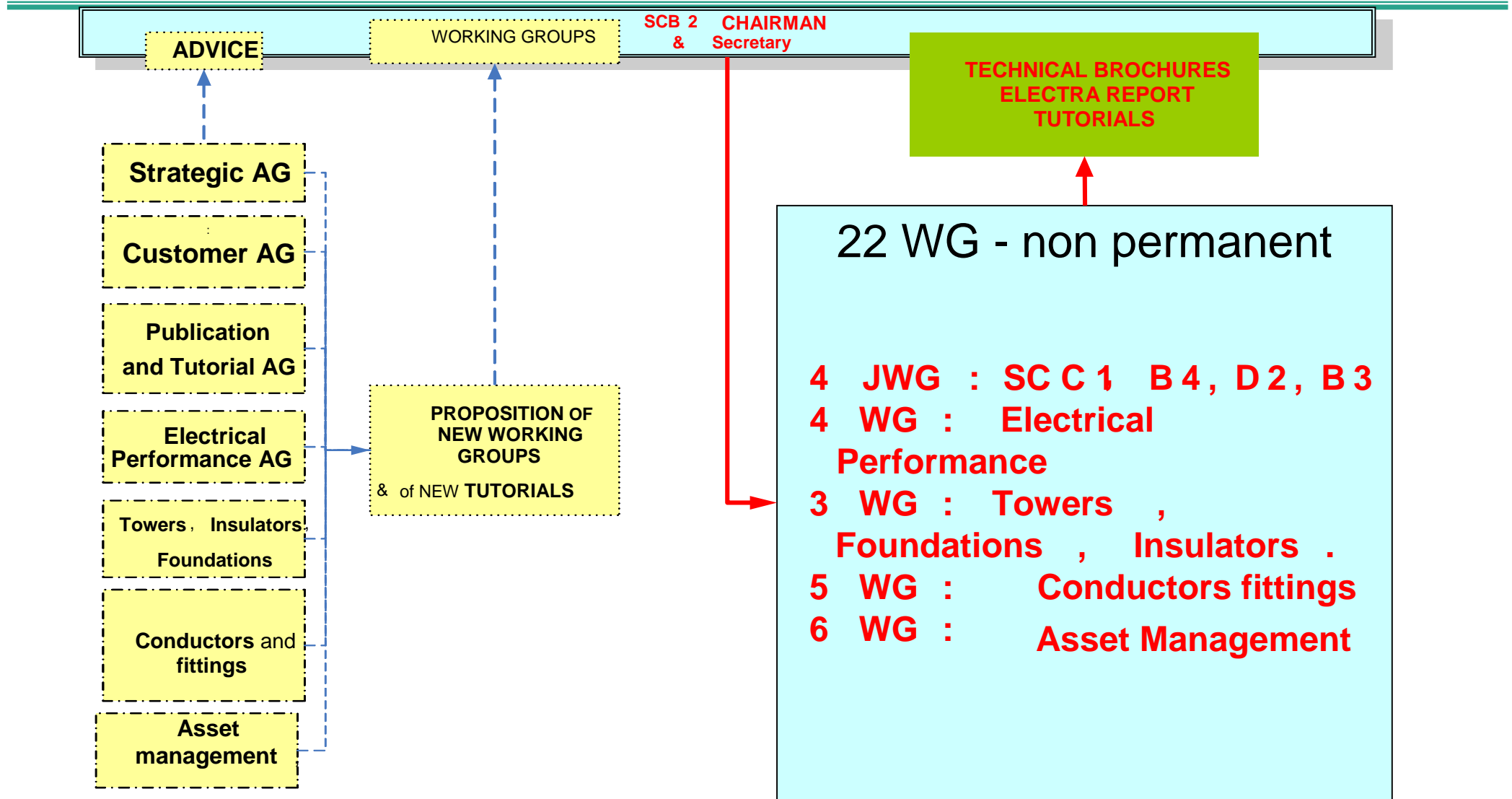
1 WG -> focused terms of references

& publish a report at the end of their mandate

All WGs = **150 international experts**: utilities, consultants, manufacturers, contractors, research centers and universities



SCB2 ORGANISATION

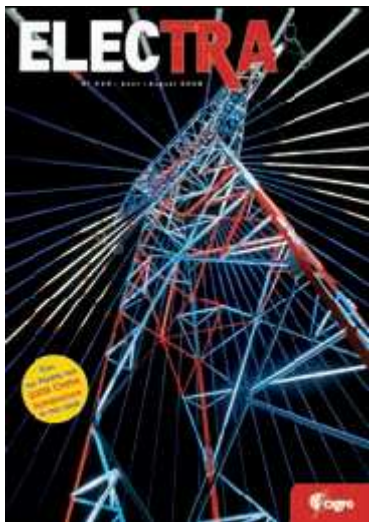




SCB2 : PRESENT ACTIVITIES & RECENT TB : Asset Management, Reliability & Availability

1. **WGB2.16 : Meteorology for OHL**
2. **WGB2.22 : Mechanical Security Measures for OHL**
3. **JWGB2/B3.27 : Live line maintenance : a management perspective**
4. **WGB2.29 : Anti- and de-icing systems for HV and UHV overhead lines**
5. **WGB2.34 :The Impact of Line Configurations for 800 and 1100 kV OHL**
6. **WGB2.39 :Design guidelines implemented for High Intensity Wind**
7. **WGB2.40 :electrical distances between live parts and obstacles for OHL : revision of IEC standard**

 1. **TB 353 - August 2008 - Guidelines for increased utilization of existing overhead transmission lines – WGB2.13**
 2. **TB 350 -TB No 350 – WGB2.06 How OHL Respond to Localized High Intensity Winds Basic Understanding**
 3. **TB 344 – April 2008 - Big Storm Events - What we have learned – WGB2.06**
 4. **TB 294 – 2006 - How OHL are re-designed for uprating/upgrading – WGB2. 06**
 5. **TB 291 – 2006 - Guidelines for meteorological icing models,statistical methods and topographical effects – WGB2.16**
 6. **TB 286 - 2006 - Reliability based design methods for OHL-Advantages, Applications and comparisons – WGB2.06**
 7. **TB 278 –2005 - The influence of line configuration on environment impacts of electrical origin – WGB06**
 8. **TB 274 – 2005- Consultation models for overhead lines projects August 26th, 2008**



Guidelines for Increased Utilization of Existing Overhead Transmission Lines

Electra - **August 2008**

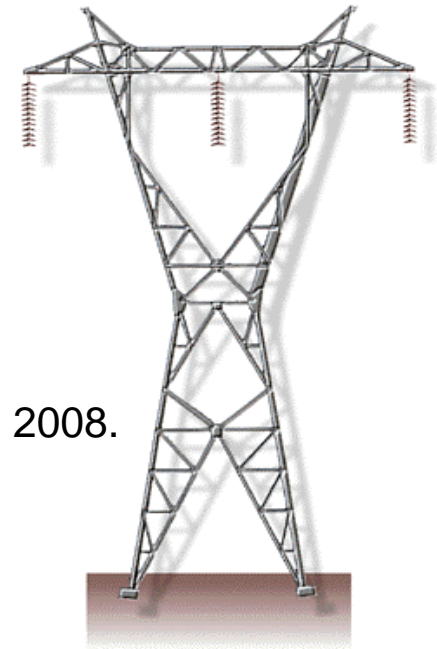
WG 13 Management of Existing Overhead Lines

Keith Lindsey

Tutorial IEEE PES Meeting in Pittsburg PA, USA, on July 2008.

Towers, Poles and Conductors WG
on Management of Overhead Lines.

About 80 to 100 in attendance, and will received.



CIGRE SC B2
Tutorial
1 of 24

August 26th , 2008

www.cigre-b2.org

TB No 353 – WG B2.13
Guidelines for increased utilization of existing overhead transmission lines

background – why



- age of OHL about 50 years
- design life 40 to 50 years has been reached
- OHL matured beyond the serviceability and or economic life
- OHL require some form of life extension
- need to increase capacity of existing OHL
- difficulties in obtaining approvals for construction of new OHL
- emerging opportunities for third party utilisation (eg telecommunication)



TB No 353 – WG B2.13
Guidelines for increased utilization of existing overhead transmission lines

aim of technical brochure



- guidelines for the economic & technical considerations

- transmission line asset renewal & any combination of
 - uprating
 - upgrading
 - refurbishment
 - asset expansion
 - life extension

- over 50 case studies are provided

- audience - executives & asset managers

CIGRE SC B2
Tutorial
4 of 24



TB No 350 – WGB2.06 How OHL Respond to Localized High Intensity Winds Basic Understanding

- Large-scale storms
- Synoptic winds
- Downbursts
- Tornadoes

LOCALIZED

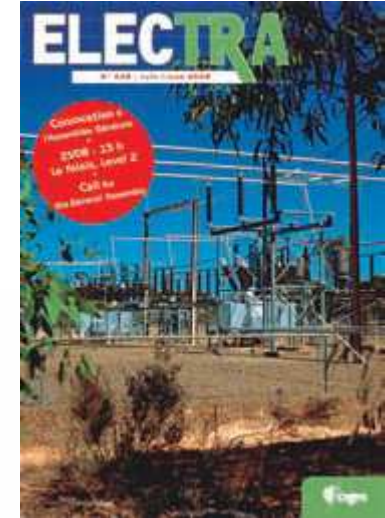


Figure 2.17 Conductor blow out during 'Bora' Wind Storm in Croatia- Jan 2003
(Photograph courtesy F Jaki)

Definitions - Downburst

- Strong downdraft inducing an outburst of damaging winds when reaching the ground
- Macroburst (>4km)
microburst



(Reid and Revell, 2006)

Definitions - Tornado

- Visible narrow funnel
- Fujita-Pearson (FPP) scale

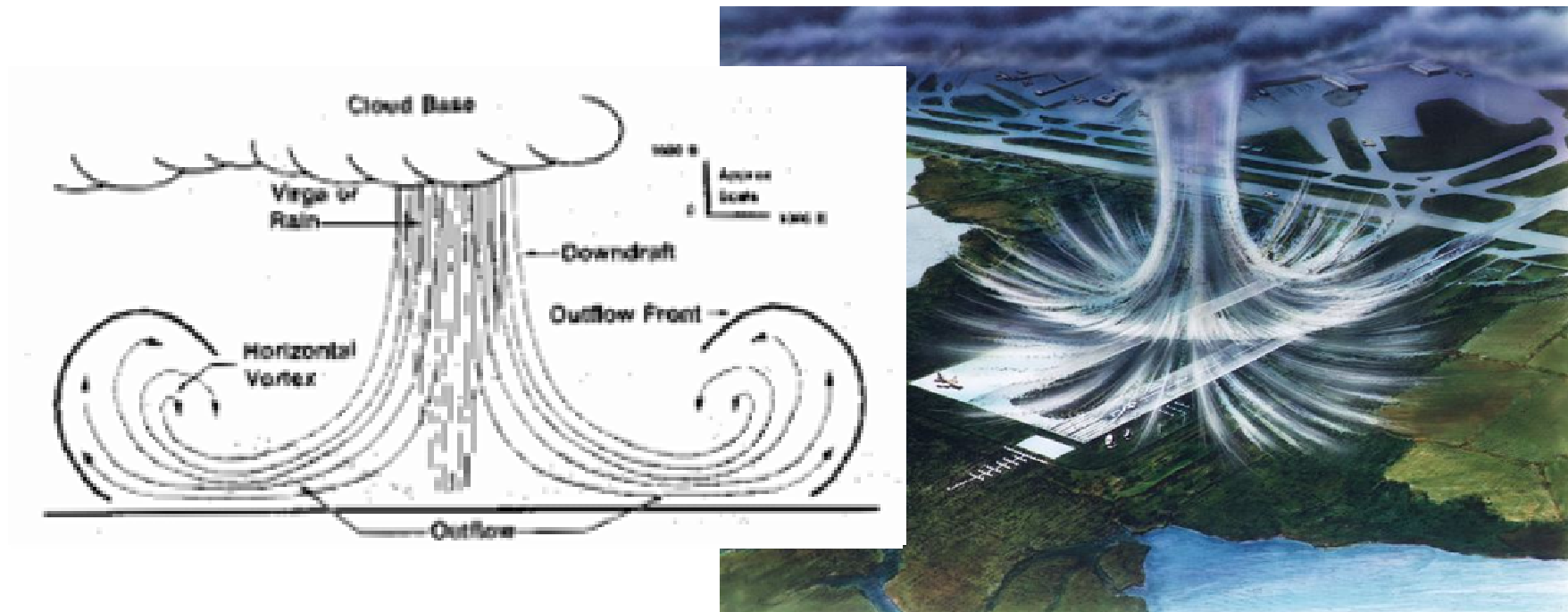


(www.torro.org.uk)

Scale	Max. wind speed (m/s)	Path length (km)	Path width (m)	Expected damages
0	less than 33	less than 1.6	less than 15	light
1	33-50	1.6-5.0	15-50	moderate
2	50-70	5-16	50-160	considerable
3	70-92	16-50	160-500	severe
4	92-116	50-159	500-1600	devastating
5	116-142	159-507	1600-5000	incredible

Wind field models - Downbursts

- Ring vortex



CIGRE WG B2-16

Meteorology for Overhead Lines

***Report on Guidelines for Meteorological Icing
Models, Statistical Methods and
Topographical Effects***



by
André Leblond
Task Force B2.16.03



**SC B2 Technical Meeting
Brasília, Brazil
Sept. 13, 2005**

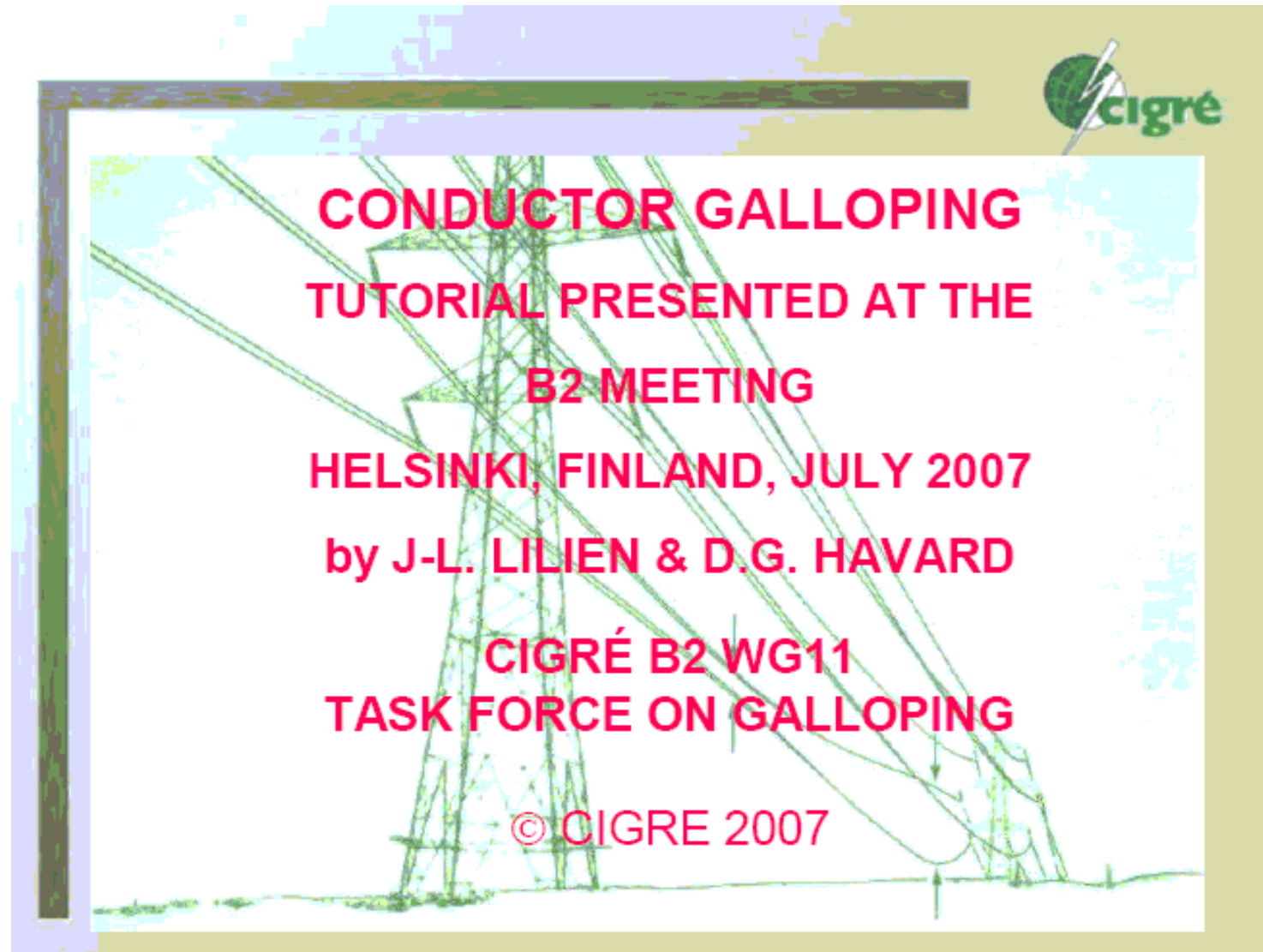


SCB2 : PRESENT ACTIVITIES & RECENT TB : Mechanical Behavior of Conductors and fittings

1. WGB2.25 : Specifications for revision of IEC standards
2. WGB2.30 : Fatigue endurance capability of conductor/clamp systems
3. WGB2.31 : Modeling of Aeolian Vibration
4. WGB2.32 : Assessing the performance of aged fittings
5. WGB2.33 : Cable cart/trolley (cycling) safety on old conductors (earthwires)

-
1. TB 332 – 2007 - Fatigue endurance capability of conductor/clamp systems-
update of present knowledge
 2. [TB](#) 322- 2006 - State of the art of conductors galloping –WGB2.11
 3. TB 277- 2005 - State of the art, survey on spacers and spacers dampers
 4. TB 273- 2005 - Overhead conductor safe design tension with respect of aeolian vibrations

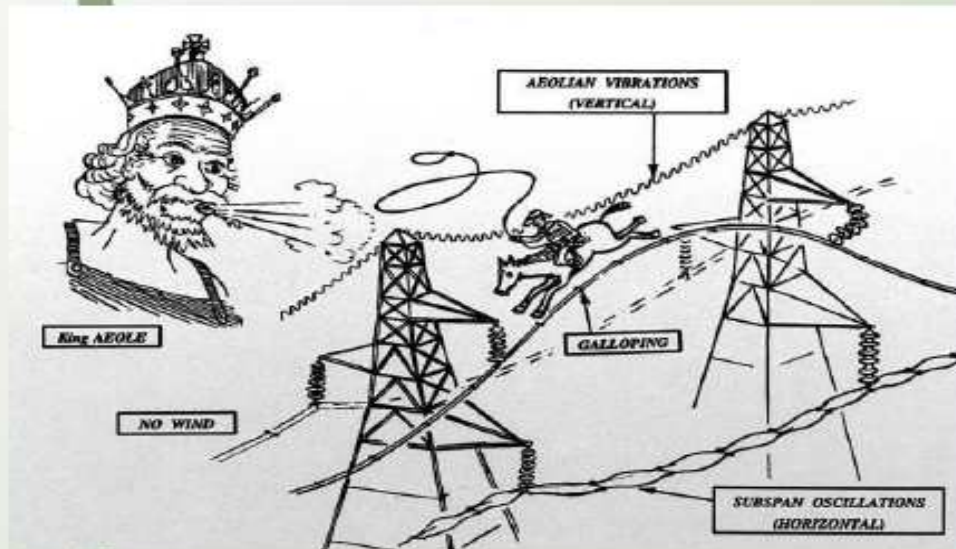
SCB2 : PRESENT ACTIVITIES & RECENT TB : Mechanical Behavior of Conductors and fittings

The slide features a background image of a high-voltage power transmission tower with multiple conductors. The text is overlaid in a bright red color. In the top right corner of the slide, there is a small CIGRE logo.

**CONDUCTOR GALLOPING
TUTORIAL PRESENTED AT THE
B2 MEETING
HELSINKI, FINLAND, JULY 2007
by J-L. LILIEN & D.G. HAVARD
CIGRÉ B2 WG11
TASK FORCE ON GALLOPING
© CIGRE 2007**

SCB2 : PRESENT ACTIVITIES & RECENT TB : Mechanical Behavior of Conductors and fittings

What is ice galloping? Definition



Galloping is a motion with:

- Low-frequency (from 0.1 to 1 Hz)
- Large-amplitude (from ± 0.1 to $< \pm 1$ times the sag of the span)
- Up to 4 times the sag on distribution lines
- Wind-induced vibration of both single and bundle conductors

- A single or a few loops of standing waves per span
- Ice or wet snow accretion on the conductors
- It is a self-excited phenomenon.

Lilien and Havard, TF B2.11.06

2

SCB2 : PRESENT ACTIVITIES & RECENT TB : Mechanical Behavior of Conductors and fittings



Control of Galloping(2 of 3)

Clockwise from top left:

- Rigid Interphase spacers
- Flexible interphase spacer
- Aerodynamic drag damper
- Air flow spoiler



Lilien and Havard, TF B2.11.06 16

If you want to know more, contact David Hearnshaw AG mech. Behaviour of conductors or JL Lilien.

August 26th , 2008

www.cigre-b2.org



SCB2 : PRESENT ACTIVITIES & RECENT TB : Mechanical Behavior of Conductors and fittings

Tutorials already presented:

- a. Fittings for Optical Fibre Cables – Paris, August 2004
& other venues.**
- b. Safe Design Tensions – Rio, September 2005 & other
venues.**
- c. Assessment of Aeolian Vibration Severity – Athens,
April 2006 & other venues.**
- d. Conductor Galloping – Vienna, Cable Dynamics
Conference, Dec 2007
Sherbrooke University, Canada, Jan 2008.
IEEE, Las Vegas, Jan 2008.
WISMIG, Arlington, USA April 2008.**

If you wanted to be on the list, please contact us !



SCB2 : PRESENT ACTIVITIES & RECENT TB : ELECTRICAL PERFORMANCES

- 1. TFB2.20 : Management of risks due to load flow capacity increase**
- 2. WGB2.26 : A Guide to Evaluating and Accepting New Types of Overhead Conductor (high temperature)**
- 3. WGB2.36 : Direct real time monitoring systems**
- 4. WGB2.38 : Evaluation of High Surge Impedance Load solutions**

-
1. TB JUNE 2008 : AC resistance of conductors
 2. TB 331 : Considerations relating to the use of High Temperature conductors (WG03,WG11 and WG12)
 3. TB 324 : JUNE 2007 : Sag tension calculative methods
 4. [TB](#) 299 : August 2006 : Selection of weather conditions for OHL rating
 5. [TB](#) 244 : April 2004: Conductors for the uprating of overhead lines



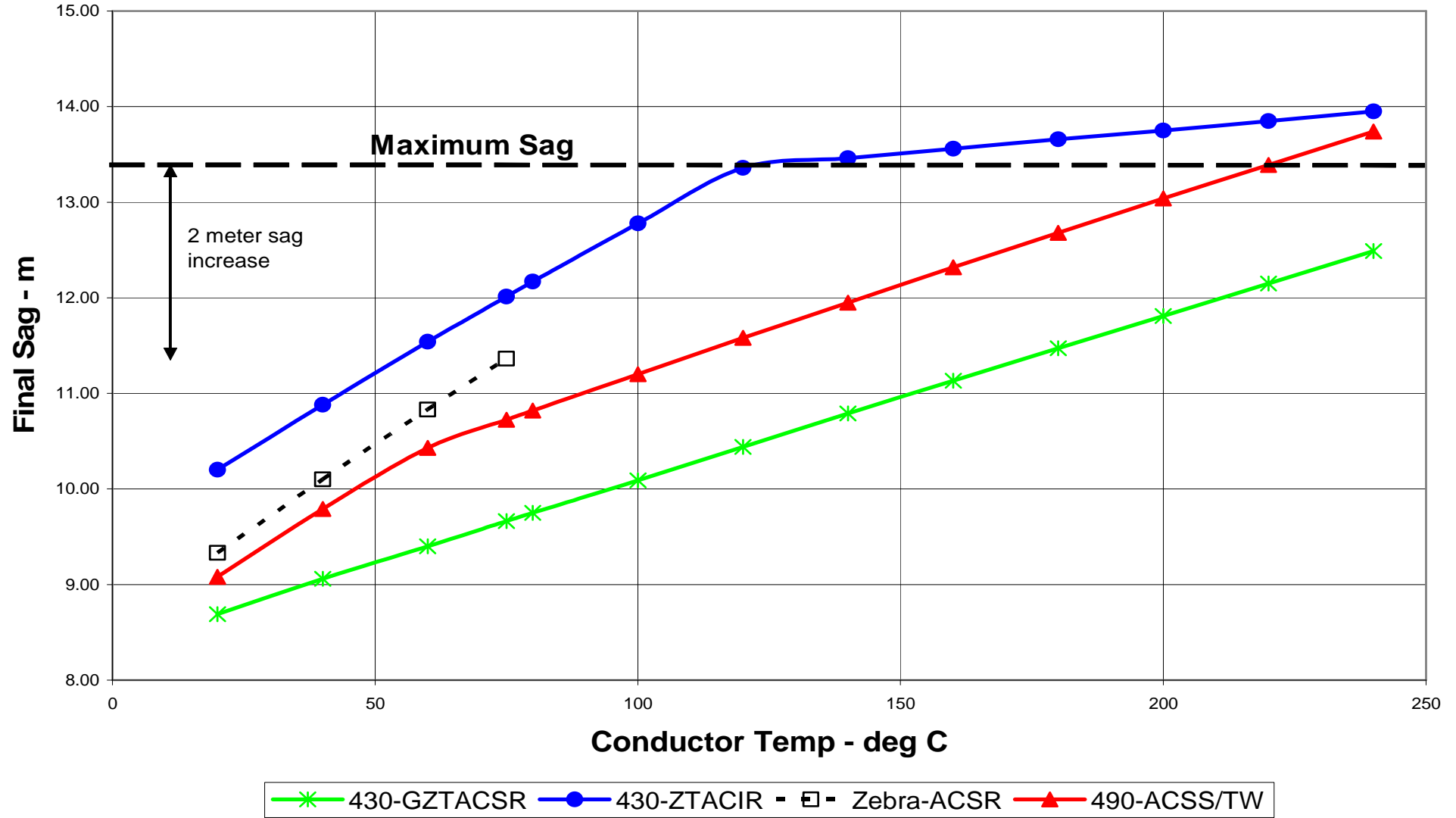
**Tutorial on
CIGRE Technical Brochure 244
“Conductors for Uprating Overhead Lines”**

CIGRE B2 Technical Meeting
Prepared by WG B2.12

1. Operating existing conductors at higher temperature.
2. Replacing the existing conductors with new conductors having lower electrical resistance.
3. Reconductoring with HTLS conductor capable of operation at a high temperature but within the existing line limits on sag and tension.



Case 1 - Final Sag vs Conductor Temperature



SCB2 : PRESENT ACTIVITIES & RECENT TB : TOWERS, INSULATORS, FOUNDATIONS

- 1. WGB2.08 : Transmission Line Structures**
 - 2. WGB2.21 : Arc protection and diagnosis of composite string insulators**
 - 3. WGB2.23 : Geotechnical and structural design of the foundations of HV & UHV Lines**
-

1. TB 333 –2007 - Guide to the establishment of naturally polluted insulators test stations
2. TB 306 –2006 - Guide for the assessment of old cap & pin and long-rod transmission line insulators made of porcelain or glass
3. TB 284 – 2005 - Use of corona rings to control the electrical field along transmission line composite insulators
4. TB 281 –2005- Design and installation of micropiles
5. TB Oct. 2008 : Reliability based calibration of foundation strength factor using full-scale test data : a guide for design engineers

4 Joint Working Groups

4 JWG or JTF: To develop overall optimised system solutions with other SC

1. Impact of HVDC lines on the economics of HVDC project :JWG B2/B4/C1.17
→ Seminar on the 5 & 6th of June in BUENOS AERES
2. OHL geographical and asset Information System:
JTF B2/D2.18 →TB 2008
3. Increasing capacity of overhead lines : JWG B2/C1.19
→ 3 Seminars : Helsinki July 2007- OSAKA nov 2007 - PARIS – June 2008
4. Live line maintenance : a management perspective : JWGB2/B3.27
-> TB in 2011

STUDY COMMITTEE B2 : Accomplishments 2006 to 2007

- 13 Electra articles , 12 technical brochures - 11 tutorials

Recommandations :

- One for COUNTRIES hosting WGs to ask TAG or WGS Convenors to organize TUTORIALS
- A second one to TAG convenors to propose a'one day TUTORIAL during each WGs meetings

THANK YOU !