



SC B2
OVERHEAD LINES



29 Novembre 2018

CIGRE SESSION 2018

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SC B2 OVERHEAD LINES



The field of activities of Study Committee B2 covers:

1. the design,
2. the construction,
3. the operation, including the mechanical and electrical (in cooperation with SC C4) design of line components (conductors, ground wires, insulators, accessories, structures and their foundations),
4. the validation tests,
5. the study of in-service performance,
6. the assessment of the state of line components and elements,
7. the maintenance,
8. the refurbishment and life extension as well as upgrading and uprating,
of overhead lines

Chairman: Herbert Lugschitz

Secretary: Wolfgang Troppauer



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WGs with Italian participation

- JWGD2/B2.39: Design, deployment and maintenance of Optical Cables associated to Overhead HV Transmission Lines (Giorgio Diana)**
- WGB2.45: Bushfire characteristics and potential impacts on Overhead Line performance (Alessandra Gariel)**
- WGB2.48: Experience with the mechanical performance of new conductor types (Alessandra Manenti, Giorgio Diana, Umberto Cosmai)**
- WGB2.50: Safe handling of fittings and conductors (Giovanni Pirovano, Umberto Cosmai)**
- WGB2.55: Conductors for the Uprating of Existing Overhead Lines (Andrea Freddo)**
- WGB2.57: Survey of operational Composite Insulator Experience and Application Guide for Composite Insulators (Giovanni Pirovano, Alberto Pignini)**



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WGs with Italian participation

- WGB2.58:** **Vibration Modeling of High Temperature Low Sag conductors - Self Damping characterization**
(Alessandra Manenti, Giorgio Diana, Umberto Cosmai, Igor Bianchi, Laura Mazzola)
- WGB2.59:** **Forecasting Dynamic Line Ratings** (Andrea Freddo)
- WGB2.61:** **Transmission Line Structures with Fibre Reinforced Polymer (FRP) Composites** (Marco Goretti)
- WGB2.63:** **Compact AC Transmission Lines** (Stefano Villa)
- WGB2.64:** **Inspection and Testing of Equipment and Training for Live-Line Work on Overhead Lines** (Alessandro Parizia)
- WGB2.65:** **Detection, Prevention and Repair of Sub-surface Corrosion in Overhead Line Supports, Anchors and Foundations** (Marco Goretti)



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WGs with Italian participation

- WGB2.66:** Safe handling and installation guide for high temperature low sag conductors (Alberto Oscar, Igor Bianchi, Alessandra Manenti, Giorgio Diana, Andrea Zuin)
- WGB2.68:** Sustainability of OHL conductors and fittings – Conductor condition assessment and life extension (Simone Radrizzani, Giorgio Diana, Umberto Cosmai)
- WGB2.69:** Coatings for Power Network Equipment (Cristina Chemelli, Pietro Marcacci, Giovanni Pirovano, Alberto Pignini)
- WG B2.70:** Aircraft warning markers and bird flight diverters for Overhead Lines – Experience and recommendations (Alessandra Manenti, Giorgio Diana, Umberto Cosmai)



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Temi di maggiore interesse emersi nel Technical meeting (28-29 Agosto):

- metodologie e tecniche di valutazione dello stato dei componenti delle linee (*sostegni, conduttori, morsetteria, isolatori, fondazioni*);
- introduzione di nuovi materiali e soluzioni innovative per le nuove linee del “futuro” (con l’utilizzo di materiali compositi non solo per gli *isolatori ed i conduttori*, ma anche i *sostegni e le fondazioni* delle linee di alta tensione);
- nuovi materiali consentono prestazioni superiori rispetto ai tradizionali (in termini di leggerezza, tenuta meccanica ed elettrica, resistenza alla corrosione,..), ma richiedono nuove tecniche di manutenzione e valutazione dello stato, sulla base anche delle prime informazioni di ritorno sul loro impiego in esercizio (vd. Tutorial B2 del 30 Agosto: *Experience with the mechanical performance of non-conventional conductors* → ricaduta su norme IEC in preparazione);
- riciclabilità dei materiali: i materiali utilizzati nelle linee elettriche tradizionali (metallo e vetro, *in primis*) sono completamente riciclabili, lo stesso non sempre vale per i nuovi materiali;
- presentazione delle attività del WG *Affordable overhead transmission lines for sub-Saharan countries*, con obiettivo di trasmettere il know-how al fine di ottimizzare l’impiego delle già ridotte risorse finanziarie disponibili per l’elettrificazione di questi Paesi.



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Session e Poster Session

PS1: Overhead Lines and Information Technology [7 Papers]

- Dynamic Line Rating: forecasting and operational experiences [3]
- Innovations to improve line performance and safety [4]

PS2: Experiences leading to Improvements of OHL [11 Papers]

- Studies and research to define electrical and mechanical parameters for OHL design [3]
- New methods and tools for design and inspection of overhead lines [5]
- Methods for increasing reliability of overhead lines [3]

PS3: (Joint PS B2/C3) Technical and environmental aspects of OHL [12 Papers B2 & 4 Papers C3]

- Vegetation and right-of-way ROW [2]
 - Public Acceptance and Tower Design [6]
 - EMF, corona noise and insulation coordination [7]
 - Life Cycle Assessment (LCA) [1]
- “380kV double circuit compact "Vitruvio" towers equipped with antitorsional insulating crossarms”, P. Berardi, I. Alario , M. Gambassi, S. Memeo, A. Piccinin, M. Rebolini, O. Colombo, G. Verrillo
 - “Passive loops: effects on distance protections and lightning performances of EHV overhead lines”, F. Palone, M. Forteleoni, G. Gemelli, S. Gentilini, L. Buono, M. Rebolini



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Preferential Subjects Session 2020 concordati in Administrative meeting:

PS 1 : Condition based maintenance for increased sustainability of OHL

- Monitoring, modelling
- Health index, remaining life, degradation mechanisms
- Risk assessment

PS 2: Enhancing line performance

- Innovative designs and materials, compaction, changing AC to DC, voltage upgrade, etc.
- Earthing & lightning performances
- Current carrying capacity and losses

PS 3: Resources and design considerations

- Design with respect to lifetime, maintenance, and restoration (live line, ergonomics, skills for erection and maintenance, robotics)
- Design and refurbishment for a changing environment



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Latest Technical Brochures

- TB 653 (2016)** Safe Design Tensions for Single Conductors Fitted With Elastomer Cushioned Suspension Units
- TB 694 (2017)** Ground potential rise at overhead AC transmission line structures during power frequency faults
- TB 695 (2017)** Experience with the mechanical performance of non-conventional conductors
- TB 708 (2017)** Guide on repair of conductors and conductor-fitting systems
- TB 731 (2018)** The use of robotics in assessment and maintenance of overhead lines
- TB 744 (2018)** Management guidelines for balancing in-house and outsourced overhead transmission line technical expertise



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CIGRE - IEC 2019 Conference on EHV and UHV (AC & DC)

New Trends in Advanced Technologies for Efficient, Economical and Resilient Power Systems

CIGRE Study Committees involved

- A2: Power Transformers and Reactors
- A3: Transmission and Distribution Equipment
- B1: Insulated Cables
- B2: Overhead Lines**
- B3: Substations and Electrical Installations
- B4: DC Systems and Power Electronics
- C4: System Technical Performance
- D1: Materials and Emerging Test Techniques





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Grazie per l'attenzione

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