



CIGRE Study Committee B2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP¹

WG N° B2.69	Name of Convenor: FARZANEH Masoud (Canada) E-mail address: farzaneh@uqac.ca
Strategic Directions #²: 1 and 2	Technical Issues #³: 3, 9 and 10
The WG applies to distribution networks⁴: Yes	
Potential Benefit of WG work #⁶: 2, 3 and 5	
Title of the Group: Coatings for Power Network Equipment	
Scope, deliverables and proposed time schedule of the Group	
Background: <p>The last decade saw the development of a variety of surface engineering techniques and advanced coatings with properties like self-cleaning, icephobicity and anti-corrosion. These new technological advances can potentially benefit the power industry in reducing the risk of flashovers on insulators, corona losses and noise from conductors and fittings as well as mechanical problems caused by ice and snow accretion on overhead power networks. These technologies not only have the potential to increase the reliability of transmission assets, but may also enable a reduction in the capital cost of new constructions.</p> <p>In order to evaluate the potential applications and benefits of such coatings for overhead power networks, a comprehensive review of the state-of-the-art research activities related to superhydrophobic and icephobic coatings was recently carried out by WG B2.44 resulting in the publication of TB 631 in 2015. In this TB, methods for testing and characterizing various properties of these coatings were also reviewed. In particular, this study highlighted promising benefits of the use of such advanced coatings for future development and applications to power networks. At the same time, this study made it possible to identify the main deficiencies in existing standard methods concerning these coatings and to stress the need for development of new techniques for their characterization and application. Moreover, it emphasized the lack of efficient coatings against corona audible noise and urgent need for development.</p>	
Scope: <p>The main purpose of this working group is to continue the work initiated by WG B2.44 by addressing some of the open items and progressing the recommendations. The deliverables will mainly consist of practical applications and remedies rather than theoretical studies and considerations. These results will include the review and identification of new practical and durable coatings as well as surface engineering techniques in order to increase the reliability of power networks in various environmental conditions as well as to respond to environmental concerns caused by corona noise and visual aspects of overhead power networks.</p> <p>The main power network features to be considered by this working group are overhead line conductors and ground wires, outdoor insulators and transmission line structures. Surface</p>	

engineering and coating applications for other equipment such as wind turbines, substations and antennas may also discussed summarily insofar these results are applicable to them.

The scope and objectives of the WG will involve the study of the following coating characteristics for the power network features they mainly apply to:

- a) Anti-noise : conductors and fittings
- b) Anti-pollution : insulators
- c) Anti-icing : conductors and ground wires, insulators
- d) Anti-corrosion : metallic structures
- e) Camouflage : overhead line overall appearance

Additional tasks are:

- i) to update and improve existing methods and develop new ones, taking into account already reported results related to using coatings
- ii) to develop and recommend appropriate methods for testing and evaluating coatings in view of their standardization

Deliverables:

- Technical Brochure and Executive Summary in Electra
- Electra report
- Tutorial⁵

Time Schedule: start: August 2018 **Final Report:** December 2021

Approval by Technical Committee Chairman:

Date: 17/10/2017



Notes: ¹ or Joint Working Group (JWG), ² See attached Table 2, ³ See attached Table 1, ⁴ Delete as appropriate, ⁵ Presentation of the work done by the WG, ⁶ See attached table 3



Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (ref. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience

Table 3: Potential benefit of work

1	Commercial, business or economic benefit for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical direction
5	Guide or survey related to existing techniques. Or an update on past work or previous Technical Brochures
6	Work likely to have a safety or environmental benefit