CIGRE Study Committees B1 & D1

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

JWG [1]N° B1/D1.75	**Name of Convenor:** Anders Gustafsson (SE)
Technical Issues #[2]: 3	**Strategic Directions #[3]: 1**
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[5]: 1, 3	
Title of the Group: **Interaction between cable and accessory materials in HVAC and HVDC applications**	

Scope, deliverables and proposed time schedule of the WG:

Background:

High voltage cables systems consist of joints and terminations on the one hand and cables on the other hand. These accessories and cables have to function together during the lifetime of the system electrically, thermally and thermo-mechanically. These mentioned aspects of cable systems are addressed in international and within CIGRE recommendations (e.g. TB 520 and TB 663). However, chemical and physicochemical compatibility aspects between accessory and cable materials have so far not been scrutinized.

Scope:

The main tasks of the WG are:

1 To review:
- All existing international and national standard, any work done by CIGRE, CIRED, IEC, IEEE, published patents, etc.
- Papers presented at Conferences (e.g. Jicable).
- Technical Literature.
- Service experience, TSO/DNO feedback and input.

2 To analyse:
- Main parameters involved in the mutual chemical and physicochemical interaction of cable/accessory components.
- Mechanisms of degradation and/or material parameter change due to non-compatibility.
- Methods to analyze material compatibility.

3 To propose:
- Development tests to assess electrical and chemical compatibility between different materials
- If possible and deemed effective, additional tests in a type or prequalification regime

4 Scope:
- HV cable system (voltage range to be defined)
- AC and DC
- Extruded cable systems
- Underground and submarine cable systems

The purpose is to have a self-standing document that would help the understanding of interface issues relevant to coupling of different materials under high voltage and to propose testing methodologies to prove their compatibility.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra

☒ Electra Report

☒ Tutorial[6]

☐ Webinar[6]

Time Schedule: start: November 2019 **Final Report**: December 2022

Approval by Technical Council Chairman:

Date: November 5th, 2019

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

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
3	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
4	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
5	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
10	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

Table 2: Strategic directions of the Technical Council

1	The electrical power system of the future: respond to speed of changes in the industry
2	Making the best use of the existing systems
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, social and economic benefits 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 directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.
7	Work addressing environmental requirements and sustainable development goals.