CIGRE Study Committee B2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG B2.85	**Name of Convenor:** Masoud Abdolhosseinpour
Strategic Directions #[2]: 2,3	**Sustainable Development Goal #[3]: 9**
The WG applies to distribution networks: ☒ Yes / ☐ No	
Potential Benefit of WG work #[4] : 1,2,4,5,6	
Title of the Group: Emergency Restoration Systems for Overhead Lines - Guide for Design, Planning and Installation	

Scope, deliverables and proposed time schedule of the WG:

Background:

An essential issue for repair/maintenance operators of overhead lines (OHL) is an unpredictable failure event. In this regard, it is of high importance to restore the system to a stable state in the shortest time to continue electrical energy delivery to customers and prevent following unpleasant events. Investigating failure causes and then planning for reconstruction as per the original state (or probably a new design) take time. There are 2 major problems to clear the event that can extend the time schedule:

I. Supply of equipment:
It is important to have spare parts on the stock due to different types of equipment used in overhead lines under operation.

II. Reconstruction manner:
It depends on parameters such as access roads to the site and weather conditions which have caused the failure, e.g. storm

Therefore, one of the best solutions for the reconstruction of the line in the shortest time can be the use of an “OHL Emergency Restoration System (ERS)”.

Scope:

WG B2.13 published TB 175 (2000) “Management of Existing Overhead Transmission Lines” and ELT_205_4 (2002) “Management of existing overhead transmission lines: How to detect and manage threats and opportunities in a changing industry” and also ELT_222_4 (2005) “Guidelines for Emergency Resource Planning for Overhead Transmission Line Asset Owners”. There exists a lack of comprehensive guidelines for design and planning of a fast to install and optimized ERS that could assist individuals/companies dealing with OHL operation during emergency situations. The recommended working group would deal with these aspects.

The WG shall perform the following tasks:

1- Surveying and collating the typical failure modes of damaged OHLs and experiences of users of ERS.

2- Defining ERS and preliminary design consideration.

3- Specifying the various options of the ERS installation arrangement to suit different conditions, on items such as number of circuits, system voltage level and width of right-of-way.

- Existing configurations, types and materials of equipment, weather conditions, etc. will be reviewed and then arranged in different categories.
- The design philosophy of ERS shall be suited to be used under different emergency conditions.
- ERS can also be used during routine maintenance work and during the erection of a new line – e.g. to deviate other crossed OHL.
- The use of ERS for live line work like transferring of conductors from temporary structures onto permanent structures will be considered.

4- Preparing a procedure for design, types and selection of materials and also the production of emergency structures.
Easy installation, transportation to site, assembly into a variety of structure types with variable height and load capacities will be taken into account.

5- Recommendation for design and installation of temporary anchors, guy wires and foundations in different placements of structure/site conditions.

6- Recommendation for selection of conductors, shield wires, insulators and fittings.
- Changing conductor type and bundle configuration will be studied.
- Using surge arresters, optical phase conductors and other solutions can be considered in damaged sections for temporary removing shield wires.

7- Guideline for installation and dismantling of ERS.

8- Managing an OHL failure.
- Restoration strategies and planning, initial inspection of failure, stabilization of adjacent undamaged permanent structures and clearing damaged structures, safety considerations, transportation, logistics, and inspection procedures during emergency service, etc. will be included.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra
☐ Electra Report
☐ Future Connections
☐ CSE
☒ Tutorial
☒ Webinar

Time Schedule: start: December 2021 **Final Report**: December 2024

Approval by Technical Council Chairman:

Date: July 6th, 2021

Notes: [1] Working Group (WG) or Joint WG (JWG), [2] See attached Table 1, [3]See attached Table 2 and CIGRE reference Paper: Sustainability – at the heart of CIGRE's work. [4] See attached Table 3

Table 1: Strategic directions of the Technical Council

1	The electrical power system of the future reinforcing the End-to-End nature of CIGRE: respond to speed of changes in the industry by preparing and disseminating state-of-the-art technological advances
2	Making the best use of the existing systems
3	Focus on the environment and sustainability (in case the WG shows a direct contribution to at least one SDG)
4	Preparation of material readable for non-technical audience

Table 2: Environmental requirements and sustainable development goals

	CIGRE selected the 7 SDGs that are the most relevant to CIGRE. In case the WG work refers to other SDGs or do not address any specific SDG, it will be quoted 0.
0	Other SDGs or not applied
7	**SDG 7: Affordable and clean energy** Increase share of renewable energy; e.g. expand infrastructure for supplying sustainable energy services; ensure universal access to affordable, reliable, and modern energy services; energy efficiency; facilitate access to clean energy research and technology
9	**SDG 9: Industry, innovation and infrastructure** Facilitate sustainable infrastructure development; facilitate technological and technical support
11	**SDG 11: Sustainable cities and communities** Increase attention on sustainable and resilient buildings utilizing local (raw) materials, power for electric vehicles, strengthening long-line transmission and distribution systems to import necessary power to cities, developing micro-grids to reinforce the sustainable nature of cities; protect and safeguard the world's cultural and natural heritage; reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and waste management
12	**SDG 12: Responsible consumption and production** E.g. Promote public procurement practices that are sustainable; address reducing use of SF6 and promote alternatives, encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle, address inefficient fossil-fuel subsidies that encourage wasteful consumption
13	**SDG 13: Climate action** E.g. Increase share of renewable or other CO_2-free energy; energy efficiency; expand infrastructure for supplying sustainable energy; strengthen resilience and adaptive capacity to climate-related hazards and natural disasters; integrate climate change measures into national policies, strategies and planning; improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
14	**SDG 14: Life below water** E.g. Effects of offshore windfarms; effects of submarine cables on sea-life
15	**SDG 15: Life on land** E.g. Attention for vegetation management; bird collisions; integration of substations and lines into the landscape

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.